THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

REPORT FOR 1921

(WITH BALANCE-SHEET FOR 1920)

BY THE

SECRETARY,

G. CLARIDGE DRUCE, LL.D.,

CORRESPONDING MEMBER OF THE BOTANICAL SOCIETY OF CZECHOSLOVENSKA.

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to whom, at YARDLEY LODGE, 9 CRICK ROAD, OXFORD, the Subscription, 12s 6d per annum, and Non-Contributing Members' Subscription of 10s per annum, should be paid on and after January 1, 1922.

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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 1921.

BALANCE-SHEET FOR 1920.

Subscriptions received, -	£136	12	0	Balance due from 1919, -	£ 24	6	5
Donation, - - - -	0	15	0	Printing Reports, &c., -	119	0	0
Sales of Reports and Advertisements, - -	19	1	2	Purchase of Reports, -	2	7	6
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Life Members' Fund, £55 7s; invested (at cost), £35; in hand, £20 7s.
Audited and found correct, January 25, 1921.—F. TWINING.

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

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

Thanks are accorded to Mr G. C. Brown for promptly distributing 27 parcels to the Exchange Members, containing, as they did, 4837 specimens, and for editing the *Report*.

The year 1920 was an annus mirabilis in the history of Botany—not within remembrance have we had one with so small a rainfall. The result has been that many marshes are dried up, as are many of the smaller streams; bogs which in normal years were too

treacherous to walk over have become so dry as to be easily negotiable, but the botanical results have been poor. The annuals soon perished; the marsh perennials, with few exceptions, were in poor condition, while the deficiency in the flower of the hawthorn led to the natural result of a paucity of haws, and thus postponed critical work. On the other hand, the Roses were beautiful and set fruit in plenty, and the Blackberries had indeed a plenteous crop: never have I seen such enormous clusters as those which the hedges of Kerry exhibited this autumn, not only in numbers but in the size of the berries. There were but few Sloes.

We have remarked upon the poor botany the year has afforded, but Mr Butcher's splendid discovery of a new British and Linnean species is in itself enough to make 1921 memorable. It is most encouraging to see that the possibilities of the British Flora are not yet exhausted, and that our young botanists have been able to make such splendid additions as *Tillaea* and *Scorzonera*. Bryology is outside our limits, yet one cannot help but allude to the finding of *Octodiceras*, that minute aquatic Moss, in Oxfordshire this year by our youngest member, Paul Richards, a lad of 11. Other important discoveries are *Limosella aquatica*, var. *tenuifolia*, found by Mr Gambier-Parry and Mr D. A. Jones in Merioneth, and the Lizard Orchis by two Girl Guides in Berkshire, and by Mr Shrubbe in Cambridgeshire. Miss Hillard, despite her affliction, has made several records in Hayling Island, of which the rare *Lythrum Hyssopifolia* is one of the best. Our veteran member, the Rev. Prebendary H. E. Fox, has discovered *Cucubalus baccifer* in North Devon; Miss Vachell has added *Elatine hexandra* to Glamorgan; Mr C. V. Marquand, *Thlaspi alpestre* to Cardigan; while Miss Todd has found *Ludvigia* in a new locality in Hampshire.

Death has robbed us of an old and ardent field botanist, the author of a most excellent *Flora of North-West Yorkshire*, Dr F. Arnold Lees, who died on the very day we gathered *Tillaea* in the locality where he once found *Limosella*. Mr R. A. Rolfe, of Kew, an authority upon epiphytal Orchids, and Mr Drummond, another of the excellent workers at Kew, have also passed away, as has Mr W. P. Evans, J.P., of Liverpool, Mr W. Whitwell, and Canon Lett. The very close of the year robbed us of Mr Cedric Bucknall, whom

we could ill spare. Alnar Fiet, the curator of the Botanic Garden, Groningen, Holland, for 41 years, and the editor of *Floralia*, died on February 21.

The output of Botanical books has been below the average—nor need we wonder when the exorbitant price of printing is taken into consideration. Under the aegis of Sir David Prain a fifth Supplement of the *Index Kewensis* has been issued, treating of the years 1911-16, and we must congratulate the staff who have completed the laborious work. A monumental work on the Wheat Plant, by Prof. J. Percival, the outcome of many years' arduous toil, has also been published.

After an existence of 134 years, Messrs Reeve & Co. found it necessary during 1921 to discontinue the publication of *The Botanical Magazine*. It was originally started by Mr William Curtis, the author of the splendid *Flora Londinensis*, the publication of which nearly ruined him. He had a botanic garden in Lambeth Marsh, in which George Don was probably employed. In 1787 he started *The Botanical Magazine* in monthly parts, each with three coloured plates, for which 1/- was charged. By 1799 the sales increased to 3000 copies a month. On the death of Curtis, Dr John Sims became editor, but the sales were not kept up, and in 1827 Sir W. Hooker succeeded to the editorship. Mr H. Fitch, who had been brought from Glasgow, where he had been employed by a firm of calico printers, then became draughtsman, and to his skill we owe 3000 excellent plates. Sir Joseph Hooker's daughter (afterwards Lady Thiselton Dyer) drew the plates for some years, when the office was taken by Miss M. Smith, who has only recently retired from her work at Kew. At the cessation of the Magazine it seemed possible that the copyright, like so many other good things, would be acquired by the United States, but, with others, Mr H. J. Elwes, Mr Lionel Rothschild, and Mr Reginald Cory temporarily acquired it, and after failing to treat with the Board of Agriculture so that it should be issued under the auspices of Kew, it was offered to the Council of the Royal Horticultural Society, under whose aegis we trust that this historic and valuable work may be continued with even greater success.

We have to offer our sincerest good wishes to Sir David Prain on his retirement from Kew Gardens, an institution over which he

has so ably presided for 17 years. Those years included the trying period of the great war, which personally took such a heavy toll from him in the loss of his son, and yet the work of the Department went on despite the diminished staff and all the evils that came in the war's wake. It was no easy task to fill the position once occupied by Hooker, but it can assuredly be said that Sir David exceeded even the golden opinions he had already won, and that he leaves it with an enhanced reputation and with the respect and affection of every one with whom he has been brought in contact. The heartiest greetings are offered to his successor, Captain A. W. Hill, M.A., F.R.S., who has for some years acted as Assistant-Director. We hear, too, with regret that Sir I. Bayley Balfour contemplates retirement from the Royal Botanic Gardens, Edinburgh, and that Dr Otto Stapf is nearing the end of his service at Kew, where his great abilities as a systematist will be sadly missed. The year, too, witnesses the retirement from Glasnevin Botanic Gardens, after forty-two years of uninterrupted work, never marred by a single day's illness, of its very competent controller, Sir Frederick Moore, one of the original holders of the Victoria Medal of Honour in Horticulture. The good wishes of our members go with these eminent co-workers in their future years. Professor Adolf Engler retired on April 1 from the Directorship of the Botanic Garden and Museum at Dahlem, Berlin, an office he had held for over 30 years. Congratulations are offered to Mr I. B. Pole Evans, of the Department of Agriculture of the Union of South Africa, on his knighthood, and to Dr R. R. Gates on his appointment to the Chair of Botany at King's College, London, in the place of Prof. Bottomley. It is pleasing to notice that Mr John Nugent Fitch has received a yearly Civil List Pension of £75 in recognition of his services to Botany, Natural History, and Horticulture. Mr R. V. Sherring, whose help we have had ungrudgingly, has met with a pleasing recognition of his services by the presentation of the Gold Medal from the Bournemouth Natural Science Society, an honour well deserved, as Mr Sherring had assiduously collected in Jamaica, his name being connected with five new species, and he had given much material to the Herbarium at Bournemouth, which, with Miss C. A. Roper, he had been instrumental in founding.

A complete set of our *Reports* have been sent to the Library at

Louvain, and the Rector, through the Librarian, has written a warm letter of thanks to the members for their gift. In June last, when at that ancient University, I gathered that it would be well to defer sending a series of British Plants as an offering of our profound sympathy until the rebuilding of Louvain had made further progress. A set of our *Reports* have also been sent to Vienna in memory of the services rendered to the Society in past times by Prof. Hackel, Dr R. A. von Kerner, and Dr R. von Wettstein.

We are under great obligations to Dr S. H. Vines for kindly translating Dr Murr's paper on *Chenopodium*, and for other literary help. So, too, we are most grateful to the Rev. F. Bennett, Messrs W. H. Pearsall, D. Lumb, C. E. Britton, C. V. Marquand, Mr T. Gambier-Parry, and to Mr and Mrs Corstorphine for their ready and kind assistance; to Sir D. Prain and Dr A. B. Rendle for permission to consult the collections under their care; to the Editor of the *Naturalist* for the loan of the block of *Tillaea*. Our gratitude is also warmly offered to our foreign confreres, highly skilled specialists as they are, who have so kindly determined plants for us, especially to Dr Albert Thellung, Prof. C. H. Ostenfeld, Prof. Chodat, Prof. C. Lindman, Drs E. Jorgensen, J. O. Hagström, E. Almquist, and J. Murr.

We condole with Prof. Craib on the accident he met with at Perth last summer, but rejoice that he escaped from the more serious consequences which might have ensued.

Our new members for the year 1921 include the Hon. Mrs Adeane, Colonel Dr G. V. Blackford, Mr R. W. Butcher, Viscount Bryce, O.M.; Mr J. Campbell (1922); Sir J. Colman, M.A., D.L.; Mrs Dent, Dr H. Downes, Mr Clarence Elliott, Mr and Mrs J. Farrer, Mr R. J. Flintoff, Mr John R. Foggitt, Mr J. Fraser, Sir R. Godlee (1922); Viscount Grey, K.G.; Mr J. W. Haines, Rev. Henry H. Harvey; Captain A. Hill, F.R.S. (1922); Dr Daydon Jackson, Mr J. Jeyes, Rev. J. de C. Laffan, Mr J. F. M. M'Gill, the Hon. Mrs R. M'Kenna, Miss E. Noel, Miss Honor Pennycoste, Miss Lucy E. Richards, Dr F. S. Salisbury, Dr Saxby, Dr O. Stapf (1922), Prof. E. S. Troup (1922), Dr Starr, Mr R. L. Smith, Rev. F. Turreff, Sir Harry James Veitch, V.M.H. (1922); Mr F. J. Wall, Major Bates van de Weyer, Miss Wilkinson, Mr R. H. Williamson, Miss Gertrude Young, and Mr F. S. Young.

My own wanderings, after a visit to Paris and Chartres, and to Sussex and the Isle of Wight for *Leucojum pulchellum*, led me to Jersey, where a rather ungenial and a very dry spring led to a paucity of plants, and, with the exception of the Gorse, a poor display of blossom. There, despite close search, I could see nothing of *Ranunculus Aleae*, although I had the company of Mr Attenborough, who took me over the ground where it was supposed to have been gathered. The var. *dunensis* of *bulbosus* was in good condition, but no cormless plants were obtainable. I spent part of May at Wilsford, under Salisbury Plain, where the Chalk Milkwort was in magnificent growth and *Orchis ustulata* in good show. Our own lush meadows of the Thames (the adjective is now scarcely fitting) afforded such masses of *Orchis incarnata* as had never been seen there before by me, *O. praetermissa* being relatively scarcer. *O. Simia* was good and in fair quantity. In June I motored to Bangor and climbed Carnedd Dafydd, crossing over from Llyn Ogwen to Bethesda in search of an *Ajuga* recorded by Johnson in 1641. All I could find was a scionless form of *A. reptans*, which may have been the form he observed, but my search was much retarded by its being —such is luck—one of the wet days of the year, and the mountain above 1000 feet was covered in wet mist. In crossing over the stream which separates the counties of Carnarvon and Merioneth *Scirpus nanus* was seen in the latter county. At Harlech our member, Mr D. A. Jones, kindly showed us *Habenaria albida* growing in upland pasture, in beautiful condition. Nearer Barmouth, at Llanaber, an extensive marsh yielded a most magnificent growth of *Orchis praetermissa*, with *maculata* and numerous hybrids, as well as the large-flowered *maculata*, var. *macroglossa*. At the embouchure of the pass of Aberglaslyn, near Tremadoc, a marshy field had beautiful specimens of *Orchis purpurella*, nor did I see other species there. Some new county records were made at Welshpool. Several fields in Worcestershire showed masses of *Crepis biennis*, a western spreading species. Having had a fortnight in Belgium visiting the Ardennes and making some local excursions in our Midlands, on the 10th of July we started for Skye and climbed the Cuchullin to see once more *Arabis alpina* in the old locality, but it was just over flower. The heat was great and the flies numerous. There I met an old acquaintance, the well-known alpine climber, Dr Norman Collie. *Orchis*

praetermissa and its var. *pulchella*, and its hybrid with *maculata*, were locally common, but it was a poor year for grasses and sedges in Scotland. A short visit was made to Dundee, where some interesting aliens were found, in company with Mr and Mrs Corstorphine. In Kincardineshire I showed Prebendary Burdon *Cystopteris Dickieana* still growing there, and then we went north to Lerwick, where, with Mrs Wedgwood, the special plants of the Mainland were seen, including the Hawkweeds *zetlandicum*, *subtruncatum*, *protractum*, and *Rhinanthus groenlandicus*. Then Prebendary Burdon and T. Churchill accompanied me to Unst, where some strenuous work was accomplished. By the end of a month, including those seen in the preceding year, I had noted 425 species, many, of course, adventitious. This visit resulted in adding *Melampyrum pratense*, *Tolypella nidifica*, *Chara contraria*, and some other species to the flora. In September a short visit was made to Counties Wexford, Kerry, Galway, and Clare, but the trenched roads and other amenities prevented Mrs Wedgwood and myself from exploring Brandon and Sligo. The visit enabled me to find *Potamogeton coloratus*, growing with *P. lanceolatus*, var. *hibernicus*, and thus to corroborate the brilliant suggestion of Dr Hagström as to its parentage. A hybrid of *Pinguicula vulgaris* and *grandiflora* was found by the Roughty River in Kerry, where *Hieracium Scullyi* grows in its only known locality. On my return a flying visit was made to Leeds, where Mr R. W. Butcher kindly showed me *Tillaea aquatica* in a locality where it seems to be native. Bradford was visited, and Mr Cryer was good enough to show me the very rich growth of aliens, including some new species he has recently found there. Owing to the kindness of Mr Pickard we were enabled to see *Silene italica* growing plentifully near Greenhithe in Kent. It has been wrongly reported extinct. In the Erith marshes *Taraxacum naevosum* was observed. Essex was also visited, and Mr Brown kindly took Mrs Wedgwood and myself to Virley to see a *Rumex* which is closely related to *R. aquaticus*, but *Filago gallica* did not appear this season. During the year I was enabled to see about 1570 species in Britain at an age which may perhaps exculpate me from the censure this gossip justly deserves, and at 71 was enabled to climb two hills over 3000 feet in altitude.

PLANT NOTES, ETC., FOR 1921.

(Mostly New Plants to the British Isles).

ABBREVIATIONS.—† before a 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; *Gard. Chron.* = *Gardeners' Chronicle*; *Journ. Bot.* = *Journal of Botany*; *Nat.* = *The Naturalist.*

†28 (2). RANUNCULUS CORDIGERUS Viv. Fl. Cors., n. 8. Alien, Corsica and Sardinia. Espartal. Leith Docks, 1921, J. FRASER. A pretty plant, closely related to *R. sardous*, of which Rouy & Foucaud (*Fl. Fr.* i., 109) make it a sub-species. Archangeli (*Fl. Ital.* 239, 1894) makes it a variety under *R. Philonotis*, but Nyman (*Consp.* 14) keeps it distinct as an endemic species of the two Mediterranean Islands.

142. CARDAMINE PRATENSIS L., var. PALUSTRIS (Peterm.). J. F. in the *Gard. Chron.* 67, 1821, notes that, while usually sterile, he found it in June on a clay soil which in winter was inundated but was dry in the summer, and it set seeds in some plenty. This accords with my experience. Fruiting specimens are not rarely present on dry, sloping, grassy ground on upland pastures; that is, a deficiency in moisture leads to fertility. I was somewhat surprised to see it fruiting in damp places during the inclement summer of 1921 in the far northern Unst in the Shetlands, but it is a plant which stretches into high northern latitudes.

†222. BRASSICA GALLICA (Willd.). *Sisymbrium gallicum* Willd. Enum. Hort. Berol. ii., 678, 1809, according to Schinz & Thellung (*l.c.* 280), affords an earlier trivial than *Pollichii*, under which it appears in the *British Plant List*. If retained in the genus *Brassica* it must therefore stand as *Brassica gallica* (Willd.), comb. nov. Schinz & Thellung put it in the genus *Erucastrum* as *E. gallicum*.

It is also the *Brassica ochroleuca* Soyer-Willemet. The synonymy is greatly involved.

232. CAPSELLA B.-P. (L.) RHENANA E. At. (I. p. 71; II. p. 72, Class VII.). Leaves in summer and autumn strongly marked, lunulate, as in *Rep. B.E.C.* plate 4, p. 195, 1920. Rosettes numerous, sometimes budding, not very able to withstand frost. Capsules cuneiform, with almost straight lateral margins, 6-7 by 4 mm., notch insignificant; sa. similar. From Reimsbach on the Rhine, cultivated. Similar plants from Brussels. The species agrees with *C. germanica*, but has longer capsules and strikingly lunulate leaves. E. ALMQUIST.

BURSA PASTORIS. Studien über Capsella—II., Ernst Almquist, with 16 photos; pp. 41-93, Acta Horti Bergiana, band 7, n. 2; Upsala, 1921. In this are described with many figures 196 "species," under 12 groups—1, CONCAVIFORMES, in which are *Druceana*, *patagonica*, *anglica*; 2, SCIOLIOTICAE; 3, RUBELLIFORMES; 4, CORCULATAE; 5, CORDATAE; 6, OTITES, with *C. bremensis*; 7, CUNEOLATA, with *germanica*, *trevirorum*, *rhenana*, *viminalis*, from Watton, Norfolk (Robinson); 8, TRIANGULARES; 9, HETEROCARPAE; 10, LANCEOLATAE; 11, CONVEXAE, with *Brittonii*; 12, HIANTES, with *batavorum*.

†252. IBERIS AMARA L., forma HORTENSIS. A showy plant which was found in some quantity by Mr T. GAMBIER-PARRY in a field at Headington, Oxford, in 1920. The flowers are larger and the style longer than in the ordinary cornfield plant.

255. HUTCHINSIA (Br.) in Ait. Schinz und Thellung (*l.c.*, 289) state that the genus *Hutchinsia*, established by Robert Brown, consists of two distinct genera :—First, the true *Hutchinsia* with *alpina* as the type, and second, *Hornungia*, established by Reichenbach in 1837, which includes as its type the British *H. petraea* as *Hornungia petraea* Reichb. Fl. Deut ch. i., Kreuzbl. i., 33, 1837-9, et Ic. Fl. Germ. et Helv. ii., 27, 1837, vel 8. Brown's third species in the genus was *Thlaspi rotundifolium*. A closely-related genus, also European, is the *Hymenolobus* of Nuttall, which is placed by Nyman (*Consp.* 66) in the section *Hinterhubera* under *Hutchinsia*. Bobart (*Raii Syn. App.* 236, 1690) gives *Nasturtiolum montanum annuum* from Bristol. This is the *Lepidium petraeum* L., and S. F. Gray

(*Nat. Arr. Br. Pl.* ii., 692, 1821) established the genus on this species and on it alone as *Nasturtiolum*, thus 16 years earlier than Reichenbach's genus *Hornungia*. It is true there is an earlier *Nasturtiolum*, that of Medikus of 1792, but his name was still-born, representing as it does the much earlier *Coronopus*, hence it appears reasonable, if a change of name is necessary, to reaffirm *Nasturtiolum* (Bobart) S. F. Gray with the species *N. petraeum* (L.).

292. VIOLA MONTANA L. (*V. nemoralis* Kutz. = *V. Ruppii* All.) Wilmott has argued that Linnaeus' *V. montana* of 1753 corresponds in the main to the subsequent *V. elatior* Fries (1828), and that it was so regarded by the contemporaries of Linnaeus, and he does not regard the geographical restriction made by Linnaeus himself (the Lapland plant being *V. stricta* auct.—our *V. montana*) as a valid solution of the comprehensive species *V. montana*. He suggests *V. elatior* Fr. should be called *V. montana* L., and *V. montana* auct. rec. be called *V. Ruppii* All. Schinz & Thellung (*l.c.*, 295) do not agree. They follow Becker and Burnat in the view that the name *V. montana*, if retained at all, can only be applied to *V. Ruppii* (*V. stricta* auct.) if hopeless confusion is to be avoided. Burnat and Briquet rightly point out that there is a reason why the name *V. montana*—though it is ambiguous and has been variously interpreted—should not fall out, namely, the fact that the next oldest name, *V. Ruppii* All. (1774), covers *V. stagnina* in part and has been so used, whereas the name *V. stricta*, which is often used for our *V. montana*, originally (Hornemann, 1815) indicated *V. stagnina* Kit. (1814). Schinz & Thellung (*l.c.*, 295) cannot admit a change of name as far as the Swiss Flora is concerned, because of the numerous non-hybrid forms intermediate to *V. canina*, which indicate that *V. montana* cannot be continued as a species but must be regarded as a sub-species of *V. canina* L., sub-sp. *Ruppii* All. pro spec., pro parte = Gaudin sub *V. montana* pro parte Schinz & Thell. comb. nov., for Fries (1828) contrary to the statement of Becker (1917) did not constitute a *V. montana*, sub-sp. *montana*, but a var. of *montana*.

308. POLYGALA SERPYLLIFOLIA J. A. C. Hose in Usteri Ann. d. Bot. 21, stuck 39, 1797, vice *P. serpyllacea* Weihe in Flora ix., 745, 1826, testibus Schinz & Thellung, *l.c.*, 294, with the varieties *mutabilis* (Dumort.), *major* (Rouy & Fouc.), and *vincoides* (Chodat).

†315. FRANKENIA PULVERULENTA L. See "The Dubious Plants of Britain," *Rep. B.E.C.* 746, 1919. Lately there has come into my possession a specimen of this species from "the ballast heaps, Birkenhead, Cheshire," gathered there in July 1869 by Mr H. S. Fisher. It is not mentioned in the *Flora of Cheshire* and is an alien, of course.

350 (2). SILENE STRICTA L. Alien, W. Europe, N. Africa. Maryburgh, Lanark, with *S. annulata*. Det. at Kew. R. GRIERSON. Very like *S. Muscipula*, but with longer, more acute and ciliate calyx teeth, and smaller auriculate petals.

†355. S. ITALICA Pers. Syn. i., 498, 1805. The first British record is in the *Eng. Bot. Suppl.*, No. 2748, 1832, as *S. patens*, on the authority of William Peete, who says he found it at Dover, Kent, in 1825. (*S. nutans* also grows there.) Syme (*Eng. Bot.* ii., 66, 1864) records it from between Dartford and Darenth, apparently perfectly wild on roadsides and in chalky ground, and also says it occurs on Salisbury Crags, Edinburgh. In the *Flora of Kent* 6, it is also given from Darenth Wood. Mill found it at Greenhithe in 1863, and J. C. Melvill says it is "quite wild," and he found it abundantly in 1869-71. W. W. Reeves is cited as the authority for its occurrence in the lane leading from Dartford to Darenth Wood, and Wolley-Dod found it on the roadside between Dartford and Lane End in 1888-9. Unfortunately, the Rev. E. S. Marshall in this work confused *S. dubia* with *S. italica*, and the remainder of the localities cited in the Kentish Flora refer to *dubia*, not to *italica*. Babington (*Man.* 55, 1904) considers it an escape, and Hooker (*Student's Flora*) puts it among the "excluded species." In the *Cambridge Flora* (iii., 81) it is unfigured and bracketed—in the same way as the fugitive *S. dichotoma*—and is said to be rare or extinct. No mention is made of the Edinburgh locality. Syme's description is stated to be only *italica* in part, but it seems to be made with Syme's usual accuracy, and the reproduced figure is from the original plate. Nor can one accept the sweeping assertion that *italica* has been by British botanists greatly confused with the varieties of *nutans*, although it is clear that in the isolated instance of *Flora of Kent* such is the case. In *Hayward's Pocket Book* it is kept as a distinct species. *S. italica*

is a native of Portugal and the south of Europe, and can scarcely be accorded native grade. That acute Yorkshire worker, Mr J. F. Pickard, visited the district of Greenhithe in 1920 and discovered the plant growing in considerable quantity. He kindly gave me two separate localities in which he found it. In October 1921, accompanied by Mrs Wedgwood, I visited the place and found *italica* in considerable abundance on a chalk-bank and in two chalk quarries. It grew in such luxuriance as to show it was no recent immigrant—indeed, it has the appearance of being native—but its continental distribution (Portugal and South Europe) is against its indigenity, and *Kentranthus ruber* and *Cheiranthus Cheiri* were in the vicinity. We may, however, still claim it as a well-established plant whose mode of origin is conjectural. The erect or ascending peduncles and the ripe capsule scarcely protruding from the clavate calyx mark it at once from forms of *S. nutans*.

412. SPERGULARIA MARGINATA Kitt., var. GLANDULOSA Druce. In *Journ. Bot.* 130, 1921, Mr H. W. Pugsley describes a new forma *glabrescens* Pugsl., a name which indicates its characters. It occurs in Kent, at Dover and Lydden Spout; Dorset, at Winspit; in Carnarvon, at Llanfairfechan; Devon, Plym Estuary; Norfolk, Hunstanton; and Walney Island; also in Fife, Burntisland; Nairn; Forfar, Auchmithie; and Kirkibost, North Uist.

†460 (4). ABUTILON THEOPHRASTI Medikus Malvenfam. 28, 1787, supplants the later *A. Avicennae* of Gaertner (*Fruct.* ii., 251, 1791). The sentimental feeling for the retention of the trivial *Avicennae*, given in honour of the great Arabian botanist Avicenna or Ibn Sina, is to a great extent overcome when the earlier name chosen by Medikus commemorates the father of botany.

488 (2). GERANIUM PURPUREUM Vill. Mr A. J. Wilmott (*Journ. Bot.* 93, 1821) demonstrates the distinctness as a species of Villars' plant, which he states is synonymous with *G. modestum* Jord., recorded in these pages by Clement Reid (*Rep. B.E.C.* 429, 1909), which occurs in the Channel Isles!, Cornwall!, Devon!, Dorset, Somerset, Waterford, and Cork. He gives the name var. *Forsteri* to Forster's plant in *E.B.S.* 2648, 1830, from Middleton and Stokes Bay, Sussex. He also describes var. *intermedium* Wilmott from

Dorset (see *Rep. B.E.C.* 240, 1912, Chesil Beach, Riddelsdell); Porlock, Somerset; Lynton Foreland, Devon; and Barry, Glamorgan. He also records a hybrid *G. Robertianum* × *purpureum* which appeared spontaneously in his garden.

†513. IMPATIENS GLANDULIFERA Royle. Mr Britten (*Journ. Bot.* 264, 1921) states that as a varietal trivial *candida* must replace *alba* (which he suggested, *l.c.*, 201, 1920) as it was figured and described by Lindley *Bot. Register*, t. 20, 1841, as *I. candida*. It is doubtful whether even a varietal rank is not too high for a mere colour variation, although when the colour form is perpetuated for several generations by seed it may perhaps claim it.

537. ULEX EUROPAEUS L. The vitality of seeds buried for 26 years is asserted in *Nature* 492, 1921, by J. PARKIN.

†552 (2). TRIGONELLA MARITIMA Del. Alien, Ital. mer., Sardinia, Afr. bor., Palestine. Leith Docks, 1920, J. FRASER.

†574 (2). MEDICAGO MUREX Willd. Alien, Eur. mer. Leith, Midlothian, J. FRASER.

†641 (3). ANTHYLLIS TETRAPHYLLA L. Alien, Reg. Medit. Carinal. Radyr, Glamorgan, 1921, R. L. SMITH. I am responsible for the identification of this striking species, a frequent plant on the coasts of the Mediterranean.

†*Gen.* 144 (2). DORYCNIUM (Tourn.) Scop. Fl. Carn., ed. 2, ii., 287. *Bonjeana* Reichb. Fl. Germ. Excurs. 507, 1832.

†643 (5). D. HIRSUTUM Ser. in DC. Prod. ii., 208. Alien, Eur. mer. et or. Carinal. Radyr, Glamorgan, 1921, R. L. SMITH. Identified by G. C. DRUCE.

†644 (3). LOTUS BIFLORUS Desr. in Lam. Enc. iii., 604. Alien, Ital. mer. Espartal. An endemic species put under the genus *Tetragonolobus* by Seringe. Leith Docks, plentiful in 1921, J. FRASER.

†649 (5). L. ORNITHOPODIOIDES L. Alien, Eur. mer. Carinal. Radyr, Glamorgan, August 10, 1921, R. L. SMITH.

923. ROSAE MUSEI REGNI SUECICI in Methodum Naturalem Redactae Arkiv. för Bot., by S. Almquist. pp. 51, tab. 8. Stockholm, 1920. In this critical paper Dr Almquist has grouped the Roses in 11 sections—1, Semiherbaceae; 2, Subtropicae; 3, Systylae; 4, Humidicolae; 5, Glareicolae; 6, Protafzelianae; 7, Gallicae; 8, Villosae; 9, Tomentosae; 10, Afzelianae; and 11, Caninae. He gives three names to characterise glandulosity—1, Epiboladenses, " sunt glandulae superficiales (rarius etiam in pagina superiore sitae ": supra, ff.), vulgo etiam rami ± glandulosae; 2, Craspedadenses, sunt glandulae marginales; 3, Anadenae, glandulis carent. A clavis and figures of the leaves are given, and 378 species are defined. Of these in the various types the following are given for Britain, though not as yet included in our Lists, the bracketted names only being in our Floras:—Type 1, RUBEAE—*R. Leffleri* At., *R. bicaucasica* At., *R.* sub-sp. *incanescens* H. Br., (*aciphylla* Rau), and sub-sp. *trichardala*. Type 2, RUFULAE—(*R. stylosa*), *R. brachiata* Déség., *R. infra-rufula* At., (*R. Forsteri* Sm.), *R. glauci-accurrens* At. Type 3, SUBCRISTATAE—*R. lenifolia* Mtss., (*R. subcristata*), *R. Dingleri* At., *R. syringifolia* Mtss. Type 4, JEBEI—*R. molliglaucigera* At., (*obovata* Baker, *R. tomentosa* Sm.), *R. bi-Borreri* At., *R. Jebei* At., (*arvatica* Baker), *R. colpogena* At., sub-sp. *tricho-colpogena* At. Type 5, WAHLENBERGII; Type 6, ACMENOPHYLLAE; and Type 7, GABRIELSSONII—none. Type 8, SATURELLAE—*R. Swarziana* Fr. Type 9, OPACIFORMIS—*R. glauci-pellita* At., *R. opaciformis* Mtss., *R. Loennquistiorum* At., (*R. jundzillana* Bess.?, *R. trachyphylla* Rau). Type 10, EXTENSIFRONTIS—none. Type 11, TRAENII—(*R. pimpinellifolia* and *rubella* Sm.), *R. anti-Traenii* At. Type 12, ORBICANTES—sub-sp. *R. molli-orbicans* At., *R. glutinosa* Sibth. & Sm., sub-sp. *glabri-Borreri*, (*Borreri* Woods). Type 13, DECURTATAE—*R. repens* Scop., (*R. caerulea* Woods, *R. arvensis* Huds., *R. micrantha* Sm.), *R. decurtatella* At. Type 14, NUBILASCENTIS—none. Type 15, CANINELLAE—none. Type 16, GRAVETII—(*R. obtusifolia*). Type 17, CONNIVENTES—sub-sp. *obscura* Pug. Type 18, CUNEATULAE—*R. molli-indutula* At., *R. quasidumetorum* At. Type 19, PODOLICAE—*R. Matssonii* At. Type 20, PROLATULAE—(*R. evanida* Baker). Type 21, INSERTAE—sub-sp. *R. macracena* Mtss., *R. cheshiriensis*, (*rubiginosa*). Type 22, PINELIENSIS—sub-sp. *molli-pineliensis* At., (*scabriuscula* Woods, and *Woodsiana*), *R. semi-*

scabriuscula At., *R. scabratella* At., *R. bohemica* H. Br., *R. glaucina* Rip., sub-sp. *R. affinis* Rau, *R. chlorina* At., sub-sp. *R. pratensis* Ach. Type 23, CONTRACTAE—sub-sp. *caryophyllaceae* Bess., *R. nudatella* Mtss. Type 24, ACUTIFORMIS (includes *pomifera*, is not given from Brit.)—(*agrestis* Savi), *R. glaucamphibola* At., *R. amphibola* Dgl. & Oz. Type 25, RIGIDAE—*R. heterophylla* Woods, (*R. senticosa* Ach.), sub-sp. *rigidiformis* At. Type 26, CHAVINI—(*tomentella* Lem.) *R. luxemburgiana* Crép. Type 27, ACHARII—*R. permollis* At., *R. Klukii* Bess., *R. Acharii* (*R. caesia* Sm., *R. sylvicola* Rip.), *R. quasi-Acharii* At., sub-sp. *Roffarieri* Chaub., *R. quasi-sylvicola* At., sub-sp. *anglica* At., (orig. spec. in Hb. Univ. Upsala). Type 28, HAILSTONEI—(*R. Lintonii* At., *R. Hailstonei* Bak.), sub-sp. *fuscatula* Mtss., *R. gnophora* Mtss., sub-sp. *trichognophora* At., *R. dolata* At. Type 29, FLAVIDIFOLIAE—none. Type 30, LAETOCOLA-RANTIS—none. Type 31, LINDSTROEMII—*R. normanniana* At., *R. quasi-Lindstroemii* At., *R. retecta* Mtss. In the 8 tables there are 44 squares, the 11 spaces on the top being the names of the different sections. The 4 side spaces are occupied by the type-names. Each of these is in four divisions, designated " gl." = glauca glabra; " glf." = glaucae hirtae (glauciformis); " vir." = viridis glabrae; " virf." = viridis hirtae (virentiformis), so that each table has room for 704 possible names. On table 5, for instance, *obtusifolia* comes in the last column headed " Canina Craspedadenae Epiboladenae," the space in the side column being marked " Type GRAVETII," of which it belongs to " virf." division.

929 (2). ROSA—group ACICULATAE. One of the forms of this group, a handsome plant with very long aciculi on the peduncle, with leaves glabrous above and doubly serrate, was found on the borders of Whittlebury Forest, Northamptonshire, in October last, when it was too late to obtain satisfactory specimens. The fruits were large and the sepals persistent.

950. R. SPINOSISSIMA × EGLANTERIA, forma CANTIANA (Wolley-Dod), under *R. spinosissima* × *rubiginosa* in Journ. Bot. 178, 1921, from Boxley Warren, Kent; Roxburgh, Haddington, and E. Perth.

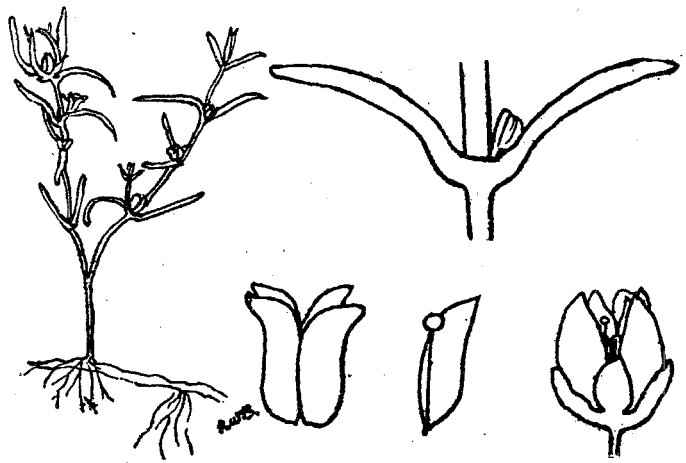
THE GENUS ROSA: ITS HYBRIDOLOGY AND OTHER GENETICAL PROBLEMS, J. W. Heslop Harrison, in Trans. Nat. Hist. Soc. of

Northumb., Durham, and Newcastle-on-Tyne, v., pp. 244-298, tt. 15, 1921. A most suggestive paper, treating on the very difficult problems of Rose classification, genetics, and hybridity. He admits 8 species found in his area—*canina*, *Afzeliana* (which consists of *glauca* and *coriifolia*), *rubiginosa*, *agrestis*, *mollis*, *tomentosa*, *pimpinellifolia*, and *cinnamomea* (no locality for this alien species being given). The paper cannot be condensed in a satisfactory manner, but no student of the Roses can afford to ignore it. A history of the recognised Rose Hybrids is given. He records *R. pimpinellifolia* × *lutetiana* from Horden, Durham, and probably from Cowpen Bewley; *R. pimp.* × *dumetorum*, Durham (t. 11), on the magnesian limestone; *R. pimp.* × *coriifolia*, var. *frutetorum* (t 12) (=*R. hibernica*, var. *laevigata*), and *R. rubiginosa*, var. *comosa*, East Lothian (Barclay); *R. pimp.* × *glauca*, Corbridge, Northumb.; *R. pimp.* × *omissa*, Slaley, Northumb. (t. 13) (it is the *Sabina* of Baker and Tate from this place 60 years ago); *R. pimp.* × *tomentosa*, var. *sylvestris*, Hawthorn Dene, Durham (t. 14); *R. coriifolia*, var. *Lintoni* × *lutetiana*, not localised (Harrison names it × *Rosa promissa*). Plates of *R. pimp.* × *rubiginosa*, *R. eminens* (Durham), *R. pimp.* × *mollis* (Northumb.), *R. pimp.* × *omissa* (Barclay, Auchterarder), and ripe fruits of others are given. The paper should be read in connection with that of Almquist, for although the methods of approach were reversed by Mr Harrison, yet the conclusions arrived at are similar. Each has produced a table which can be used as a kind of Mendeleeff's Periodic Classification to predict the existence of roses as yet undiscovered. The vertical group of the chemist agrees with Harrison's section-species, the horizontal series or periods with his species-types. If the six members of the Caninae be divided into three pairs of more nearly related section-species, there is an immediate parallel to the divergence in Mendeleeff's table into two sub-groups. Almquist, working as a systematist, and Harrison, as a geneticist, arrived at essentially the same conclusions and announced them practically simultaneously.

978. SAXIFRAGA DECIPIENS **Ehrh.** Recently this name has been dropped in favour of *S. rosacea* Mönch on the ground that *decipiens* was a nomen nudum. Schinz & Thellung show this is not the case:

that *decipiens* in Ehrhart's *Beitrage* v., 47, 1790, had a synonym, *S. petraea* of Roth, cited (*Tent.* v., 1, 184), which makes the name valid, Roth's plant being *decipiens* and not the Linnean *S. petraea*.

1006 (2). TILLAEA AQUATICA L. While looking for plants at Adel, near Leeds, on September 1st, I chanced to come across a new British plant, *Bulliarda aquatica* L. (nat. order: Crassulaceae). It is associated with *Limosella aquatica* and *Polygonum minus*, and it grows in abundance on the drying-up mud. The dry season probably made it more conspicuous than usual and enabled me to find it. It is in all probability native and it grows in untouched private grounds that people seldom visit. The only planted shrubs anywhere near are Rhododendrons, but those are a long distance away. R. W. BUTCHER.



TILLAEA AQUATICA L.

TILLAEA AQUATICA L. *Bulliarda aquatica* DC. in Bull. Soc. Philom. iii., n. 49, p. 1, 1801. *Crassula aquatica*. Sect. *Bulliarda* DC.—Flowers hermaphrodite; calyx 4-partite; corolla 4 petals; carpels 4; capsule many seeded; plant small, 2-5 cm. high; leaves linear, 4 mm. long; flowers shortly stalked or sessile; petals very small, white. *Icones Fl. Danica*, t. 1510. *Exsiccata Schultz* 3927. *Puel et Maille* 40, from Sweden. Distribution inland: Norway, Den-

mark, Sweden, Finland, Russia, North Germany, Bohemia, Moravia, Austria (rare). First found in Britain by Mr Roger W. Butcher on September 1st, 1921, on the muddy margin of a piece of water in a park near Adel, N.-W. Yorkshire. To this place Mr Butcher conducted me on September 15th. The plant was in considerable quantity, growing with *Limosella*, *Callitriche*, and other native aquatics and mud-species. (See *Nat.* 1920.). The geographical distribution is in favour of its being a native species: it is not a plant at all likely to be introduced, as it has no beauty to commend it, nor has it economic value. It may be held that as it occurs in a place which has been visited by competent botanists such as F. Arnold Lees that it could scarcely have escaped their lynx-eyed observation if it had been long growing there. Against this may be urged that it is a very small species and may have been masked by the *Callitriche*, etc., and it may well be that this dry and hot summer of 1921 not only lowered the level of the lake but also stimulated the growth of *Tillaea*. There is a chance that, like *Hydrilla*, it may have been introduced at no very distant date by natural means—by aquatic birds which frequent the lake. But there seems no real reason to challenge its grade as native. Prof. Ostenfeld tells me that in Denmark it occurred formerly in one spot, but disappeared from it, and was about 15 years ago found in quite another part of the country—north point of Jutland, where it still grows. Mr Butcher must be very warmly congratulated on his discovery, and on running the plant down with Mr C. H. Horrell to this species. I am very grateful to them for submitting a specimen on September 9th, and for their kindness in showing me the plant *in situ*. It is one of the most important additions to our flora of recent years. One may also state that there is a curious and as yet an inadequately-explained phenomenon—that of plant periodicity: the sudden appearance in many places of a rare species, *Cyperus fuscus*, for instance, of which an example is cited on p. 401. *Cerastium pumilum* and *Teucrium Scordium* offer other examples, but there are many others which will occur to field-botanists, so that the non-observance of a plant in a locality is not a proof of its complete absence.

1073. CIRCAEA CANADENSIS Hill Veg. Syst. x., 21, 1765. Fernald (*Rhodora* xix., 85-8, 1917) states that this is the same plant

as the European *C. intermedia* Ehrh. Beitr. iv., 42, 1789, and if it is retained as a species may have to bear that name. Its grade is, however, open to question. Some botanists consider it a hybrid, of which we lack experimental proof, and its geographical distribution is somewhat antagonistic. The majority of systematists put it as a variety of *C. alpina*. Fernald's view is opposed to the suggestion that *C. intermedia* is *C. alpina* × *C. lutetiana*, for, as he states, *C. lutetiana* does not occur in N. America.

†1092 (2). BUPLEURUM FONTANESII Gussone Ind. Sem. Bocc., 1825. Alien, Sicilia, Sardinia, Calabria. Ibrox, Glasgow, 1921, R. GRIERSON. Det. at Kew. Closely related to and perhaps only a variety of *B. Odontites* L., into which it is merged by Nyman, and in the Kew Index. Archangeli keeps them distinct.

†1188 (2). LONICERA CAERULEA L. Alien, Europe. On waste ground, Woodhall Spa, Lincoln, 1921, Rev. F. S. ALSTON.

1243 (2). SOLIDAGO CAMBRICA Huds. Fl. Angl. 319, 1762. Much confusion exists as to this plant. As represented in the chief herbaria, it consists of several entirely different forms. I believe the true *S. cambrica* to be a distinct species with a rather limited range of distribution having its centre in the Snowdon range, and in order to define the species I have gone to the original description by Dillenius. Hudson (*l.c.*) describes his plant "foliis lineari-lanceolatis subserratis incanis panicula corymbosa terminali." He cites the synonym "Narrow-leaved Mountain Golden Rod, with a hoary leaf and conglobate flowers, from *Ray Syn.* 177 (first described in the 2nd edition of the *Synopsis* 81, n. 3, 1696). In pascuis ad summitatem montis Glydyr copiose. An vero species distincta sit a vulgari, an potius ejusdem varietas ulteriori examini relinquimus D. Lhwyd?" Dillenius, *l.c.*, 177, rightly queries Plukenet's plant as being this. He says, "An Virga aurea montana, biuncialis, pumila, foliorum apicibus obtusis *Pluk. Alm.* 390, t. 235, f. 8. In hortis culta ad pedalem assurgit altitudinem." In 1778 Hudson (*Fl. Anglica*, ed. 2, 369, 1778) adds the counties of Westmorland and York to the "in pratis montosis in Wallia," and in both editions cites Petiver's "*Virga aurea Cambrica* H.B., t. 16, f. 11." Hudson, however, overlooks the minute and clear descrip-

tion of the plant by Dillenius (*Hort. Eltham.* 413), which is now given in an abbreviated form. It shows what a close and accurate observer Dillenius was. "We owe this species of *Virga aurea* to the unwearied labours of Edward Lhwyd, who first observed it in the pastures of Mount Glyder, leaving to further examination whether it is a distinct species or merely a variety of the common form. Many years have now passed, during which, both in the Eltham Garden and in others, it has remained distinct from the common species. The chief difference is that the numerous flowers are attached only to the top of the stems, where they are closely massed together in a small obtuse spike. It is, besides, shorter in height, with a more slender stem, smaller, narrower, and more hairy leaves. Further, it blossoms earlier than the common species, especially in gardens. Its stems are a span or nine inches in height, growing simply, that is, without branches, from the same root, and even in the garden rarely exceeding the height of one foot. The leaves are slightly rounded at the base, with those on the main stem longer; they are marked by teeth, which on the lower part of the leaf are slightly round, but on the upper part are longer and more pointed; the veins are prominent, and the leaves, especially round the margins, are closely covered with fine hairs. On the leaf-blades this hairiness is hardly visible, but it is not sufficient to warrant the description of the leaves as *incana* (hoary), wherefore Lhwyd rightly termed them *subincana* (sub-hoary), for the leaves approach simple greenness. The stems, on the other hand, are covered with numerous short hairs, chiefly at the base of the leaf-pedicle. Furthermore, the numerous flowers are attached to the top of the stems—shortly pedicelled, sometimes a single flower on one pedicel, sometimes two or three, and more rarely four—and in these flowers it would seem to be a peculiar feature that the extremity of the style is not recurved, but is divided, as it were, into two brightly coloured, nearly straight, connivent segments. The florets seem to have these segments narrower than in the common species. The calyx is cylindrical and formed of narrow scales. In gardens it flowers in July [or earlier]; in its natural habitats not so early. Moreover, in gardens it produces more shoots from a single root and longer leaves than in the places where it grows wild. It has been named 'Mountain Golden Rod, with narrow, almost sub-hoary, hairless leaves,

clustered florets (*Ray. Syn.*, ed. prim., 50, n. 3; ed. 2, 81, n. 3; ed. 3, 177, n. 4. *Hist. Oxf.*, part 3, 125, n. 18.). Petiver named it (*Herb. Brit.*, t. 16, f. 11) *Virga aurea Cambriae*, and gave an illustration of the common species, borrowed from *Epist. Camerarius* 748, which he improperly passed off as the species here described.' '' Dillenius goes on to describe another form which he observed " four years ago in August, on a sandy hillock near a marshy flat at Petersfield, which was only two inches to a span high, with pointed as well as obtuse leaves.'' He thought this was no more than a variety of the common species, and might be referred to Dwarf Mountain Golden Rod, *Virga aurea montana biuncialis pumila*, twice described by Plukenet (p. 390, t. 235, f. 7), once with pointed and again with obtuse leaves (ibid. f. 8) in the *Almagestum*. " In the figure given by Plukenet the crenations of the leaves are omitted, doubtless by the engraver's carelessness, and the flowers, which, as well as the whole plant, appear to be represented in their natural size, are too small for the specimens to be referable to the *Virga aurea omnium minimum* of *Hort. R. Par.*, though Plukenet seeks so to refer them, and Vaillant (*Comm. Acad. R. Scient.* 308, n. 16, 1720) does refer them. It is also to be observed that Tournefort, Hermann, and Vaillant consider the ' Smallest of all Golden Rods with the largest blooms,' described and figured in *Par. Bat.* 245, to be identical with the plant of *Hort. R. Par.* Plukenet does not mention the source from which he had his examples, whether they were growing wild or under cultivation. Even though they were growing wild, it is not possible to identify his flowers with those of the plant of Hermann, reared as it was in a garden. I observe, moreover, in the Sherardian Herbarium (*Phytophylacium*) a dried specimen of Hermann's plant with glabrous leaves, large flowers, seated on oblong pedicels, which fully answers to the figure and description given by Hermann, and is too widely apart from the figures of Plukenet; so that I have good reasons for believing that the plants of Plukenet are only varieties of the common species. I remember also having seen a plant, the same as our Welsh species, sent from the garden at Leyden as Hermann's plant, which is so far from being reconcilable with the figure and description given by Hermann, and also with the dry specimen gathered in Hermann's time in the said garden, that I consider it quite a different plant. There is, more-

over, in the Sherardian Herbarium an example of *Virga aurea montana minor* of Barrelier (*Obs.* 1069, *Ic.* 783) and Boccone (*Mus.*, pt. ii., 169, t. 118). It came from Boccone himself, who left his dried plants to William Sherard, and Vaillant, as above quoted, makes this plant identical with the smallest of all *Virgae aureae* of *Hort. R. Par.* and *Par. Bat.* With this opinion I cannot agree, as the examples of that plant (Boccone's) have leaves hairy above, but below are more nearly sub-hoary than our Welsh plant; the flowers also are closely packed together, and borne on far shorter pedicels. I should have considered it a variety of our Welsh plant had not the leaves been broader in the middle and more pointed towards the extremity. A small Golden Rod, *Virga aurea humilis*, different from the common species as mentioned by Sherard (*Ray Syn. App.* 341, 1696), and again *Virga aurea vulgari humilior* (*Ray Syn.* 176, n. 3, 1724), is a plant with many leaves at the base, half-an-inch in breadth and two inches in length, growing on pedicels of two or three inches; they are serrate all round the edge and slightly hairy; the lower leaves on the stem are similar to these, while the upper become much smaller. From the axils of these leaves along the greater portion of the stem flowers issue, three or four together, on short pedicels, arranged in a kind of spike, and these flowers seem rather larger than those of the common species. This description is given from Sherard's specimen which was gathered in Ireland without the mention of a special locality. And be this sufficient for a knowledge of this species, and its distinctive marks." It is quite evident that Dillenius rejects as applicable the synonyms of Petiver and Plukenet which were afterwards added to *cambrica* by Hudson.

Miller (*Gardeners' Dict.*, ed. 1768) has made 5 British species: —(1) S. LATIFOLIA, based on *Virga aurea latifolia serrata* C. B. P. 268. He says it is not common in England, though that which grows naturally near London is generally taken for it. It is plentiful about Brabant, and the most common in Germany. (2) S. VULGARIS = *V. aurea vulgaris* Park. Theatr. 542, is "our common Golden Rod about London." A still-born name, as he cites *Linnaeus* 880 for it. (3) S. ANGUSTIFOLIA = *V. aurea angustifolia minus serrata* C. B. P. 268. In several parts of England. In woods at Dulwich, Surrey. (4) S. MINOR. This is Rand's plant, "the smaller Golden Rod with sawed leaves pointed at both ends." It grows naturally

in the woods at Hampstead, and is probably the plant of Gerard 349, 1597. Miller states that it remained quite unchanged in cultivation for many years. (5) S. MINUTA, based on *Ray's Syn.* 177, is Lhwyd's plant (but with an inappropriate and invalid name) from Wales, which Miller states flowers five or six weeks before the other. Miller's description does not quite agree with that of Dillenius. He says the leaves are a little hoary on the under-side. There is already a *S. minuta* L. Sp. Pl. 1235, 1763.

Smith (*Eng. Fl.* iii., 439) reduced all the *Solidagos* of previous British authors, including *S. cambrica*, to varieties of *S. Virgaurea*. Babington, Hooker, and Syme follow the same plan, but it is evident that these authors possessed different ideas as to what *cambrica* was. Smith (*Eng. Fl.* iii., 439) gives Hudson's, Ray's, Dillenius', and Plukenet's synonyms and says :—"Although Hudson and Willdenow (*Sp. Pl.* iii., 2066) considered it a permanent species, he could never determine it to be so," which is not to be wondered at, since these synonyms refer to more than one distinct plant. Babington (*Man.* 169, 1847) says :—" Stem 2-6 in. high, leaves ovate-lanceolate, heads larger," which has no precise significance; Hooker (*Student's Flora* 206, 1884) gives " Short, leaves broader, ciliate, cymes simple, heads larger—usually in mountainous districts," which also is indefinite; and Syme (*Eng. Bot.* v., 113) who, as usual, is more accurate, writes :—" Lower leaves elliptical-obovate; stem-leaves elliptical; all ciliate and slightly pubescent beneath; panicle reduced nearly to a raceme; anthodes large; stem 2-8 in. high," but the figure, t. 779, added to this edition is not very characteristic.

My own experience leads me to consider *S. cambrica* as described above to be distinct from the common and very variable *S. Virgaurea* L., which eventually may be proved to contain several elementary species. In cultivation the points of difference become accentuated. The flowering period is well nigh over before the lowland plant begins blossoming—this is also true of the British Alpine Thrift, *Statice planifolia*—and in both instances it suggests a physiological difference, and is unexpected, as at the first blush the warmer lowland temperature might be expected to hasten flowering. This point awaits investigation. It may well be that the incidence of light-action may be more intensive at higher altitudes, and here there are biochemical problems which await solution. In addition to this

difference of the flowering-time, the simple stem, with the flowers arranged in a loose spike-like inflorescence, starting from above the middle of the stem; the larger and stouter capitula; the narrower, elliptic, glabrescent leaves, which are ciliate on the margin, are the characters which help to differentiate it and which cultivation rather intensifies. These differences, in the main, were observed by Dillenius, who had the plant from Lhwyd and cultivated it for many years in James Sherard's garden at Eltham (the *Hortus Elthamensis* dates from 1732; Lhwyd found it before 1696). Our member, Mr J. Griffith, has had it for many years in his garden at Bangor, and he is in full accord with me in considering it distinct, an opinion strengthened by observations on it made in my own garden at Oxford, where it grew side by side with the common plant. A curious fact is that both Mr Griffith and myself failed to obtain seedlings.

Lhwyd's plant is neither common nor widely spread. I have it from the Glydyr, Snowdon, Carnedd Llewellyn, the Berwyn, and I think to it must go Don's *S. lapponica* gathered on Loch-na-gar in the eighteenth century. In herbaria it is mostly represented by montane forms of *S. Virgaurea*, the indefinite description and wrong synonyms since the time of Petiver contributing to this error. Therefore I suggest the restoration to specific or sub-specific rank of Hudson's *S. cambrica*, with the deletion of the erroneous synonyms cited by Hudson from Petiver (whose plant seems to be a small *Virgaurea*), and of Plukenet's obtuse-leaved plant, which is a more widely diffused montane var. of *S. Virgaurea*, and to designate the latter as S. VIRGAUREA L., var. PLUKENETIANA. This has the capitula nearly as large as those of *cambrica*; the leaves small, feebly toothed, obtuse; plant small, 2-8 in. Usually montane, but also occurring on the coast in Cornwall and on the Stack Rocks, Anglesey, ascending to nearly three thousand feet on An Teallach, W. Ross. Also on Ben Eay in that county; on the Cuchullins, Skye; Glen Aan, Banff; Hoo Field, Shetland; and near High Force, Durham. Under this and merging sometimes into it is nov. sub-var. *acutifolia*, a plant with the upper or all the leaves acute, which is a common mountain plant—Ravine of the Eala Water, Shetland; Ronas Voe, Shetland (Tate's *cambrica*); Fannich, W. Ross; Cuchullins, Skye; Ballater, S. Aberdeen; rocks by the Wye, Brecon and Radnor (Ley), as *cambrica*; Llanwrtyd Wells, Brecon (Painter), as *cambrica*.

Another variety of the small-flowered type is var. CORYMBOSA Druce, which occurs on the cliffs of Lunan Bay, Forfar, and at the Lizard, Cornwall, in which the flowers are clustered into a cormybose cyme, about 2 in. by 2 in., the leaves being more or less crenate.

Var. ANGUSTIFOLIA Gaudin Fl. Helv. v., 316, foliis angustioribus obscurius serratis = *V. aurea angustifolia* C. B. P. 79. This has "flores pauciores laxioresque." Gaudin gives Monte Muteto as its habitat. Miller (*Gard. Dict.*, 1768) calls it Woundwort, with linear, spear-shaped leaves almost entire, with flowers in clusters sitting close at the wings of the stalk. He goes on to say of the Dulwich plant that "the leaves are about $1\frac{1}{4}$ in. long by an eighth of an inch broad; they are almost entire and sit close to the stalk." I have never seen plants in Britain answering Miller's description; indeed, in *Index Kewensis*, I know not on whose authority, it is identified with *Senecio sarracenicus*, but that plant is not recorded by Brewer in his Surrey Flora, nor does Dulwich Wood seem a likely place. Neither Bouvier nor Gremli refer to var. *angustifolia* in the Swiss Floras, but Koch (*Syn. Fl. Germ.* 355, 1837) says:—"Elatior, foliis omnibus lanceolatis obscurius serratis vel integerrimis." A specimen I gathered at Lynmouth, N. Devon, 1896, comes under Koch's description. I have a plant with lanceolate leaves from the River Broom side, West Ross, but the flowers are pedicelled and mostly at the top of the stem—not in axillary clusters; this may be distinguished as var. LANCEOLATA nov. var. To this may be put Gardner's plant from Ericht, above Blairgowrie, Perth; Waterfall's plant from ravine near Carrickmore, Co. Dublin; Piquet's St Brelade's Bay plant, and also my Hampstead Heath specimen.

Taking Miller's or Koch's characters, we find that they rarely apply; that is, plants with a corymbose inflorescence may have broader or narrower leaves, the leaves may gradually diminish in size from the base to the summit of the stalk, or they may abruptly change from broad to narrow. Again, axillary-inflorescensed plants may have narrow or broad leaves, and plants with large capitula may show the same cross-characters. An intensive study of the plants under culture is to be strongly urged. Probably in a *Hieracium* sense there are five or six "species" grouped under *Virgaurea*. Even now I am rather doubtful whether it would not be better to put var. *Plukenetiana* under *cambrica* than under the

type, as it has the same large capitula. For the time, however, I suggest the arrangement—

S. VIRGAUREA L. (grex).
Var. *angustifolia* Gaud.
Var. *lanceolata* mihi.
Var. *corymbosa* Druce.
Var. *Plukenetiana* mihi.
Sub-var. *acutifolia* mihi.
S. CAMBRICA Huds.

1262. ERIGERON CANADENSIS and BONARIENSE. J. Burtt-Davy, writing on "New or Noteworthy South African Plants" in *Kew Bulletin* 7, 282, 1921, alludes to these two species, which have been much confused, and he refers to the misleading figures of *canadensis* in Bentham's *British Flora*, and in Britton & Brown's *Flora of the Northern United States and Canada*. *Linifolius* is supposed to be of eastern origin, though now common in South Africa, and it is the *E. bonariense* of some authors. Both occur on Tweedside and are included in the *Adventitious Flora*, where a photograph of the pappus of *bonariense* (*linifolius*) is given. Mr Burtt-Davy gives the following definitions of the species:—*E. bonariense*, for which the name *linifolius* is used—Branches long, corymbose, often much exceeding the main stem, and flowering after the heads, which terminate the latter, have shed their fruit; heads larger than in *canadensis*, fully 3 lines long; leaves grey-green, not ciliate, the lower distantly and incisely toothed or laciniate; involucre pubescent. *E. canadensis*—Branches short (not corymbose), flowering at the same time as the main stem; heads only 1½-2 lines high; leaves yellowish-green (not grey-green), the lower sparingly toothed to quite entire, ciliate, with short, mostly incurved hairs arising from small tubercles; involucre almost glabrous; pappus usually tawny (in *bonariense* white or reddish in herbarium specimens).

†*Gen.* 297 (5). HELIOPSIS Pers. Syn. ii., 473, 1807.

†1295 (15). H. SCABRA Dunal in Mém. Mus. Par. v., 54, t. 4, 1819. Alien, Amer. bor. Hortal. Glasgow, 1921, R. GRIERSON.

†1302. HELIANTHUS DIFFUSUS Sims Bot. Mag. xlv., t. 2020, 1818, according to Schinz & Thellung (*l.c.*, 307) takes precedence of *H.*

rigidus Desf. Cat. Hort. Par., ed. 3, 184, 1829, and *H. scaberrimus* Elliott Bot. Sketch 423, 1824, not of Bentham of 1844. It is the *Harpalium rigidum* Cass. in Dict. Sc. Nat. XXV., 300, 1821.

†1307 (2). VERBESINA ENCELIOIDES Benth. & Hook., ex A. Gray in Bot. Calif. i., 350. *Ximenes Encelioides* Cav. Ic. ii., 60, t. 178, 1793. Alien, North, West, and South America. Hortal. St Peter's Marsh, Bristol, 1916, Miss COBBE.

1360. MATRICARIA INODORA. The maritime forms of this species are described in *Journ. Bot.* 170, 1921, by L. V. Lester-Garland. Three varieties are given:—(1) *maritima* L., (2) *salina* DC., (3) *phaeocephala* Rup. This latter is one of the noticeable plants of the Shetlands, and is remarkably fine. A specimen nearly three feet high was seen at Haroldswick which had over a hundred flowers, each between two and three inches in diameter.

1360. M. INODORA L. Schinz & Thellung (*l.c.*, 304) agree with Briquet and Cavillier that if, as generally assumed by recent writers of Floras, *M. maritima* and *M. inodora* are to be united, the trivial name *maritima* must be used as being the older, in accordance with Internat. Rule 9, Art. 46, contrary to the general procedure, even when the species is put into the genus *Chrysanthemum*. The inland plant is *Matricaria maritimum* L., var. *agrestis* Weiss in Hall. und Wohlf. in Koch Syn. 1424, 1895. Probably this may strike some botanists as ridiculous, since the commoner plant is not maritime, and the name may for that reason remain unchanged.

1362. M. DISCOIDEA Pursh in Britain. Druce in Gard. Chron. 186, 1921. First evidence: a plant gathered at Kew in 1871 by Mr J. Gilbert Baker in *Herb. Druce*, labelled by Baker *M. Chamomilla*, var. *discoidea*.

†1363 (3). M. TCHIHATCHEWI (Boiss. in Tchihat. Asie Min. Bot. ii., 256), as *Chamaemelum*. Alien, Asia Minor. Hortal. On a sandy common near Byfleet, Surrey, May 1921, Lady DAVY; named by W. B. TURRILL. See *Boiss. Fl. Or.* iii., 332. It grows near *Arabis glabra* and *Ulex*, but is probably of garden origin.

1456. CENTAUREA SCABIOSA L., forma HETEROPHYLLA Beck Fl.

Nied.-Osterr. ii., 1260, 1890. Yarnton, Oxford, 1913, DRUCE; determined as above by C. E. BRITTON, who says it is described by Beck as having the lower leaves undivided, elliptical, tapering into the petiole, acute, irregularly serrate-dentate, or even somewhat lobed; upper leaves pectinate-pinnatipartite. Similar plants grow in Surrey.

1456. C. SCABIOSA L., nova forma INCISA C. E. Britton. Gravel pit near Grays, Essex; Crantock, Cornwall, A. LOYDELL in *Herb. Druce*. Leaves pinnatisect, rachis very narrowly winged, hirsute, segments spaced, oblong or elliptical, acute, narrowed at base, lobate-serrate, pubescent above, thinly hirsute beneath. A very pretty plant. The Crantock plant has less-incised leaf-segments. C. E. BRITTON.

†1512 (2). HIERACIUM BRUNNEO-CROCEUM Pugsley in Journ. Bot. 67, 1921. Allied to and confused with the Linnean *aurantiacum*; the latter occurs in many Scottish situations, and at Berwick-on-Tweed, Yorkshire, Middlesex, and Isle of Wight. Mr Pugsley's plant differs by its narrow, oblong-lanceolate leaves and in its rather small heads of a brownish-orange colour—hence the name. He identifies plants of it from Selly Oak, Worcester; Bellgrave, Leicester; Great Tew, Oxford; Glynhir, Carmarthen; Culbone, Somerset; Trentishoe and Barnstable, North Devon; Newlyn East, West Cornwall. To these may be added—Near Coventry, Warwick; Bradfield, Berks; Mangan, Cornwall; Bourn Hill, Middlesex (LOYDELL); Patshull, Staffs (Lady JOAN LEGGE); Baildon, York (CRYER); Formby Sands, S. Lancs (WHELDON); Kyle of Lochalsh, W. Ross (DRUCE).

1537. H. AMPLEXICAULE L. A note on its occurrence not only at Oxford but on a bridge crossing the Mersey, Cheshire and Lancashire (see *Rep. B.E.C.* 553, 1897), is given by Mr J. C. Melvill in *Journ. Bot.* 48, 1921. Although once nearly eradicated from Magdalen College, Mr Gambier-Parry informs me it has now spread in a remarkable manner on the roof. One may add that a similar plant was sent to the Botanical Exchange Club (see *Rep. B.E.C.* 827, 1919) labelled *H. vulgatum*, var. *amplifolium*, from the Mersey locality. "*H. amplexicaule*" was also sent to the Club (*Rep. B.E.C.* 553, 1897) from a field wall near the viaduct, Saltburn,

N.-E. York, by Charles Bailey. "Garrie Barns, Clun," is cited by Mr Melvill for Don's station. It should be Garrie Barns, Clova, Forfar, but the plant which grew there was wrongly identified as *amplexicaule*. It was *H. anglicum*, var. *amplexicaule* Bab., a native plant. Of the above the Oxford plant is true *amplexicaule*. The other plants need to be re-examined in view of the recently recorded *H. pulmonarium* by H. W. Pugsley.

1630. H. RIGIDUM Fr. Some Experiments on the Origin of New Forms in the Genus *Hieracium*, sub-genus *Archieracium*, by C. H. Ostenfeld, in *Journ. Genetics* xi., 117, 1921. In one of the experiments seeds were sown from *H. rigidum* Fr., originally from Svendborg, Denmark. Of 154 resulting plants, 153 were normal but one was different in several respects. Some flower-heads of this individual were agamized in 1911 and seed sown in 1912. The new generation flowered in 1913. All plants of this generation were uniform and like their parent. This experiment has been repeated twice. The new form he calls *H. rigidum* β. The distinguishing features are given. Other experiments resulted in obtaining a constant third form—*H. rigidum* γ. He calls them apogamic mutants and thinks that the numerous micro-species of *Archieracium* found in nature have arisen apogamically and are constant. Figures of the three forms are given.

1644. LEONTODON NUDICAULIS Banks. With reference to the much-discussed nomenclature of *Thrincia hirta*, Lacaita has come to the conclusion that—(1) *Crepis nudicaulis* L. corresponds either to *Leontodon Villarsii* Loisel. or to *L. crispus* Vill., or to a mixture of the two species; (2) *L. hirtus* L. is not identical with *Thrincia hirta* Roth, but with *L. Villarsii* Loisel., and should therefore replace the latter species; (3) the correct name for *Thrincia hirta* is *Thr. taraxacoides*; &c. Schinz & Thellung adhere to their statements in *Bull. Herb. Boiss.*, 1907, which Lacaita seems not to have read. The only new point is the definite observation by Lacaita on the specimens in *Linn. Herb.* that *Leontodon hirtus* L. (1759) corresponds to *L. Villarsii* Loisel., as we had already suggested to be possible on literary grounds, and that in 1763 *Thrincia hirta*, in the form of the synonym *Crepis nudicaulis*, came in as an additional constituent. As against Lacaita they point out—that

Crepis nudicaulis, which is not in *Herb. Linn.*, is clearly founded only on Bauhin's synonym, which is rather confused, and of which the only positive basis is the figure in C. Bauhin *Prod.*, for there is no specimen in *Herb. Bauhin.* In this figure we can only recognise *Thrincia hirta*. *L. Villarsii* is excluded by the relatively short stem of the plant figured and the incision of the leaves; and also *L. crispus* (to which the figure belongs, according to Lacaita) by the incision of the leaves, by the almost uniseriate involucre, and by the short pappus. Still, it would appear that the simple hairs given in the figure (and " setis subalatis " in the description of *Cr. nudicaulis*) tend to oppose our view. But the same difficulty arises in Lacaita's proposed identification of Bauhin's plant with *L. crispus*, for, as is well known, *Thr. hirta* (in contrast to *L. Villarsii*) has branched furcate hairs. Lacaita's suggestion that the distribution of *Cr. nudicaulis* given by Linné (after Bauhin) holds for *L. crispus* and *L. Villarsii*, but hardly for *Thr. hirta*, is quite untenable, for *Thr. hirta* is by far the most common of these species of *Leontodon* about Montpellier, as we have already pointed out. We would urge our botanical colleagues, therefore, to abide by the name *Leontodon nudicaulis* (L.) Banks em. Porter, for *Thr. hirta*. As regards the comb. nov. *Leontodon taraxacoides* suggested by Lacaita, it must be remarked that, apart from the name created by Mérat in 1831 (of the invalidity of which, as urged by Lacaita, we are not convinced), this combination was formed by Ascherson & Graebner in the sense adopted by Lacaita. Moreover, for those botanists who, like ourselves, do not regard *Thr. hirta* and *Thr. hispida* Roth as distinct species, the combination *Thr. taraxacoides* (Lacaita, *l.c.*) would not be new, but the form *Thr. taraxacoides* Gaudin (1829) sens. ampl. (incl. *Thr. taraxacoides* Lacaita) would have to be used. See Schinz & Thellung, *l.c.*, 308.

1645. TARAXACUM LAETUM Dahlst. Om Skandinav. Taraxacum —förmer in Bot. Notiser 1905. Sweden, Norway, Finland, Denmark and Russia. St Ouen's, Jersey, April 1920, G. C. DRUCE. This belongs to the Erythrosperma, and is a small plant with strongly recurved leaf-lobes.

1645. T. CHLOROLEUCUM Dahlst. Nya Ostsvenska Taraxaca, Ark. för botanik, band 10, n. 6, 1911. Sweden, Norway, Denmark,

Finland. Longworth, Berks [Ref. No. X 23], not typical, but as a form. Another modification was gathered by C. E. BRITTON [Ref. No. 1556] on Barnes Common, Surrey, May 1916. One of the Vulgaria group.

1645. T. COPIDOPHYLLUM Dahlst. Ostsvenska Taraxaca, Ark. för botanik, band 9, n. 10. Sweden, Norway. Beckley, Oxford, as an allied form, 1920, G. C. DRUCE.

1645. T. GELERTI Rankiaer Dansk Exkurs. Flora, 2 Udg., 1906. Sweden, Norway, Finland. This (as a var. or a new allied species) is the Ref. No. O 44 from Oxford (cult. since 1907), G. C. DRUCE. Another allied form was found at Gt. Burgh, Surrey, May 1911, W. A. TODD.

1645. T. LONGISQUAMEUM Lindb. f. in Acta Soc. pro Fauna et Flora Fennica 29, no. 9, 1907. Scandinavia. Beckley, Oxon [Ref. No. X 17], June 1920, as a modification, G. C. DRUCE.

1645. T. POLYODON Dahlst. Ostsvenska Taraxaca, Ark. för botanik, band 9, n. 10, 1910. Sweden, Finland, Russia. A plant, very nearly allied to the above, grew at Oxford [Ref. No. X 25], G. C. DRUCE.

1645. T. BRACTEATUM Dahlst. Oxford, May 1908; Wytham, Berks, G. C. DRUCE; Barnes [Ref. No. 358], Wimbledon, Surrey [Ref. Nos. 377, 378], W. A. TODD.

1645. T. LINGULATUM Dahlst., nova species. Oxford [Ref. No. Y 52], May 1920, G. C. DRUCE.

1645. T. UNGUILOBUM Dahlst. Nordsvenska Taraxaca in Ark. för botanik, band 12, n. 2, 57, 1912. Norway. On gravel, Oxford [Ref. No. Y 99] (cult. since 1914), G. C. DRUCE. Also from damp natural pasture, Isgarth, Sandey, Orkney, May 1920 [Ref. No. 651], H. HALCRO JOHNSTON. Dahlstedt places it with the Spectabilia.

(*The exigencies of space do not allow the lengthy descriptions of these critical* Taraxaca *to be given in this* Report.)

1663. TRAGOPOGON PRATENSE L. The Flowers and their Opening and Shutting. Miller Christy in *Journ. Bot.* 253, 1921.

1666. JASIONE MONTANA L. British forms of this are described by H. W. Pugsley in *Journ. Bot.* 209, 1921. Forma nova LAEVIS. Hounslow, TRIMEN. Var. MAJOR Mert. & Koch. Woburn Sands, Beds, and Sale, Cheshire. Mr Pugsley rejects the name *major*, which has until recently been given in Britain for the robust coast plant, to which he gives the name var. *latifolia*. It occurs on the coast from Cornwall to North Unst, and in several stations in Ireland. It is remarkably showy at Burrafirth. Var. LITTORALIS Fries. Around Bournemouth, and doubtless elsewhere.

1725. PRIMULA VULGARIS Huds. The Pollination of *P. vulgaris*, by A. A. Dallman, in *Journ. Bot.* 316-337, 1921. A very painstaking investigation. Occasional self-pollination is indicated. In St Kilda it fruits where bees and Lepidoptera are absent, but it may be due to Diptera. I found it fruiting in the Isle of Mousa, Shetland, in 1921.

1726. P. VERIS L. The darker-flowered form, recently alluded to in *Gard. Chron.*, has also been sent this year from Melmerby, Cumberland, by the Rev. W. WRIGHT MASON. It seems to be a colour-variant or mutant.

1727. P. FARINOSA L., The variation of, in Co. Durham. J. W. Heslop-Harrison, D.Sc., in *The Vasculum*, February 1921, states that *P. farinosa*, from the mountain limestone and basalt of Upper Teesdale and Upper Tynedale, and that found on the magnesian limestone of the Durham Coast are racially distinct. He therefore separates the coast plant as var. *littoralis*, differing in the shape of the flowers: in the var., segments more rounded (as in *P. sinensis*); in the type, more stellate (as in *P. sinensis*, var. *stellata*). Plants of *littoralis* are smaller and more generally form a spreading rosette. At the flowering period the coast plant has clear, bright green leaves, the type has darkish, greyer-green. *Littoralis* leaves are broader, shorter, and even fleshier, on the under surface more farinose, and in many cases entire, as contrasted with the longer and more denticulate leaves of the type. The type flowers a fortnight before *littoralis*—another instance of the earlier flowering of mountain over the allied lowland plants. The type flowers average 11.4 mm. against 10.2 in *littoralis*. The seeds of *littoralis* sown in November

commenced to grow in early spring; those of the type similarly sown did not do so till a year later. The mountain plant shows a greater range of variation—in colour, in the size of the yellow bird's eye, in doubling, and in fimbriation. *Littoralis* has its affinities with *scotica*: it is much less variable than the type. Dr Harrison contends that all the much-prized forms of variation, worked for with so much zeal and experiment in *P. sinensis*, *obconica*, and *malacoides*, exist in *P. farinosa* in nature. Consequently, the assigning of the appearance of fimbriation in *obconica* to hybridisation with *sinensis* and so on is uncalled for.

†1742 (3). ANAGALLIS MONELLI L. Sp. Pl. 1753 = A. LINIFOLIA L. Sp. Pl. 1762. Alien, S. Europe. Hortal. Waste ground, Oxford, 1921, Lady DOUIE.

1831. VOLVULUS SEPIUM Junger, var. (vel lusus) SCHIZOFLORUS mihi. *Calystegia sepium* Br., var. *schizoflora*. Corolla deeply divided—to below the middle—into five rather narrow lobes. Found by Miss TODD at Ashburton, Devon, in 1921. An analogous form to the var. *Stonestreetii* of *C. arvensis*. G. C. DRUCE.

1845. SOLANUM DULCAMARA L. Cadwell, Beds, 1921. A cow died of eating the plant. The same occurred in 1907 at Offley, near Hitchin. A farmer tells me that the most dangerous time is up to about June, and that cases are frequent, J. E. LITTLE. In the nineties a valuable flock of sheep, then in a state of parturition, were for the most part destroyed by eating *Dulcamara*, which grew in a nearly dried-up ditch bordering the field, and of which they had been freely feeding. An analytical examination showed that they were poisoned by an alkaloid (? solanine). G. C. DRUCE.

†1846. S. NIGRUM L., var. ATRIPLICIFOLIUM (Desp. Fl. Sarthe 189, 1838, as a species) Dunal in DC. Prod. xiii., pars i., 50. This name antedates the var. *sinuata* described in *Rep. B.E.C.* 33, 1920. The plant is contained in the *Flora Italica Exsiccata* 2516, from Lido, near Venice, and Beguinot says it grows promiscuously with the type but keeps perfectly distinct. That, too, is my impression so far as I have seen it on rubbish-heaps in Britain.

1894. SCROPHULARIA NODOSA L., forma (vel lusus) TERNATA

Druce. Miss HILLARD sent from Hayling Island, S. Hants, in 1921, a specimen of *nodosa* with three leaves in a whorl. It had been found also by her in a previous year. It is analogous to the so-called var. *verticillatum* of *Epilobium montanum* and Williams' var. *ternata* of *Anagallis arvensis*. G. C. DRUCE.

†1898. MIMULUS GUTTATUS DC., var. YOUNGANA (Hook. in Bot. Mag., vol. 61, t. 3363) as a var. of *M. luteus* = *M. rivularis*, forma *Youngana*. This is the beautiful *Mimulus* from Glen, Peeblesshire. See my note in *Rep. B.E.C.* 571, 1919.

1911. VERONICA BECCABUNGA L., var. REPENS Bosch Prod. Fl. Batavoe 1, 1850. This is a state rather than a true variety. It is often an autumnal form growing on the partly-dried mud of brook and pond margins. I have distributed it this year. It was first mentioned for Britain in *Rep. B.E.C.* 381, 1892, having been found by J. A. Griffith near Carnarvon in 1872. It is alluded to but not named in *Flor. Batav.*, vol. v., under t. 476, 1832.

†1923. V. TOURNEFORTII Gmel. Lacaita, as previously Williams, rejects this name, because the species is a heterogenous mixture and therefore illegal according to Art. 51-4. Schinz & Thellung (*l.c.*, 301) state that in their opinion there is no sufficient reason for rejecting the oldest name for the species in question, even if the synonyms noted by Gmelin refer to *filiformis* Sm. Still, the actual concrete plant in the authors' mind was undoubtedly, from its locality (Karlsruhe), *V. Tournefortii* auct. Moreover, Buxbaum's two figures of *V. Tournefortii* and *V. filiformis* are so similar that only a specialist could distinguish them. Any ordinary person would, as Gmelin did, mistake the one for the other. If all names with attached false synonyms are to be rejected, then at least half of the names given by Linnaeus and generally accepted would have to go. Therefore, *V. Tournefortii* Gmel. may be safely used to designate our British cornfield plant.

1934 (4). EUPHRASIA SEPTENTRIONALIS Druce & Lumb, nov. sp. Near Duncansby Head, Caithness, in turf, 2-300 ft., July 1920, G. C. DRUCE. Plant stout, shaggy-looking, sage-green, long-bracted, small-flowered, glandular. Stem—Thick, 3-8 cm. high,

fairly strict, sometimes simple, often with two opposite branches, sometimes from near the base, sometimes at the middle, sometimes above the middle, sometimes branched throughout, the branches sometimes themselves branched, and the lowest of them nearly as long as the main stem; densely clothed; hairs glandular, straight, sub-equal, comparatively few, consisting almost always of two elongated cells and the gland. Spike—Broad, with short internodes; flowering or fruiting nodes usually few, sometimes as many as 7; flowers slightly projecting from the general outline. Leaves—Lower ovate, obtuse, with few rather obtuse teeth; terminal lobe broader than long; upper ovate, somewhat obtuse, with 3-4 large sub-acute ± acuminate teeth; strongly plicate-striate on the underside; well beset with long hairs, some of which are straight, sub-equal, and glandular, the glandular ones having two elongated cells; not early caducous. Bracts—Sub-decussate, spreading, sometimes markedly deflexed, strongly rugose beneath, broadly ovate, sometimes long-ovate, broad-based, sub-acute, up to 10 mm. by 7 mm.; teeth on each side 5-6, sub-acute; terminal lobe longer than broad; sometimes the teeth of the upper bracts are narrow and acute but not aristate; clothing as of the leaves. Calyx—Teeth broad, sub-acute, with many straight, sub-equal glandular hairs; markedly shorter than its subtending bract; not accrescent in fruit. Corolla—Small, 5-7 mm. long, whitish; tube not elongating; style not protruding. Capsule—Sub-truncate, usually equalling calyx. *E. septentrionalis* differs from *E. hirtella* in its height, in its having few glandular hairs on the stem, in its branching, in its internodes, in its bracts, and in the character of its glandular hairs. From *Rostkoviana* it differs in its having few glandular hairs on the stem, in the character of these hairs, in its rugosity, in the quantity of glandular clothing, and in the size of the flowers. From *E. latifolia* it differs in its lacking the gradually narrowing untoothed bases of the bracts, in the terminal lobe of its bracts, and in its having glandular calyx teeth; in *latifolia* glandular hairs on the calyx teeth are very rare. As we were unable to match these plants among our named forms they were submitted to Dr E. Jorgensen, the well-known Norwegian expert, who says they are a new species with affinities to *E. hirtella*. *E. septentrionalis* was not observed in the Orkneys or Shetlands. It may be that the plant referred to by Williams (*Prod.* 303), gathered

by Marshall at Reay, Caithness, and seen there by Druce, may belong here. At Duncansby *E. nemorosa* and *E. brevipila* were in the vicinity. In answer to a question to Dr Jorgensen as to the influence of the host-plant in causing variation in *Euphrasia*, he writes in March 1921, that he " did think it was of little importance, on account of the report on cultivation experiments (*Pringsheims Jahrb.*, vol. 31, 1898). Later on I have had only negative results when I tried to raise *Euphrasia* from seed; neither I nor a botanical friend in another part of the country got a single plant developed. Perhaps this is due to an influence of the host-plants, which in my experiments were species of Gramineae (from seeds). *Euphrasia scotica* seems to me to be closely connected with sphagnum. It would therefore be very interesting to try if plants of that species from sphagnum bogs can be raised on a substratum of sphagnum." A beautiful variety of *E. borealis* from Unst awaits description. G. C. DRUCE and D. LUMB.

1952. RHINANTHUS CRISTA-GALLI L. = R. MINOR Ehrh., var. ROBUSTUS mihi. Filby, Norfolk, 1905, DRUCE. Wareham, Dorset, DRUCE and Mrs SANDWITH. A tall, robust plant, nearly two feet high, with broad leaves and capsules nearly 2 cm. diameter. It has much of the facies of *R. major* Ehrh. The flowers are, however, near *Crista-galli*. To this var. belongs, I think, Mr Marshall's var. *platypterus*, from Edington Junction, Somerset. G. C. DRUCE.

1975. UTRICULARIA. Some valuable Notes on the Genus and its Distribution in Norfolk are given by Mr W. G. Clarke and Mr R. Gurney (*Norf. and Norw. Nat. Hist. Soc.* xi., pt. 2, 128-161, 1920-1). The authors question the value of the specific characters derived from the presence or absence of bladders with the green assimilating leaves. They state that five specimens of *intermedia* had each one sporadic bladder: indeed, examination of some hundreds of specimens on Upgate Common showed that about 5 per cent. had sporadic bladders, while *U. ochroleuca* may possess none. Greater value is placed on the character derived from the attenuated leaf-tip of *ochroleuca* ending in a fine spine, " yet abnormal specimens of *ochroleuca* differ but little from abnormal specimens of *intermedia* in this respect," and " forms on the border-line between the two species must inevitably occur." The authors state that the only

known British specimen of the flower of *intermedia* was found on Roydon Common in 1910, but Linton found it flowering in plenty at Morden Decoy, Dorset, in 1893, and I have also seen it in flower in Dorset and Galway. The bladder-contents have been ably investigated, and there are five good plates. One gathers that true *ochroleuca* has not been ascertained to grow in Norfolk except at Foulden Common (named by Mr Bennett), but the Foulden specimens gathered there previously were named *intermedia* by Dr Gluck, as he most likely would those of the later gathering. The literature consulted by the authors, although lengthy, is not exhaustive, since there is no allusion there to Dr Gluck's lengthy paper in *Rep. B.E.C.* 511, 1910, three years prior to the one quoted from another journal, nor to other notes which have from time to time appeared in these pages.

1979. PINGUICULA GRANDIFLORA × VULGARIS mihi = × P. SCULLYI mihi. By the River Roughty, near Drohidnagower, Co. Kerry, September 1921. A beautiful intermediate of the two species, with infertile capsules. I had previously observed similar plants in the south-west of Ireland, as mentioned by Mr Scully on p. 223 in the *Flora of Kerry*, and such have also been noticed by Mr Scully and Messrs Marshall and Shoolbred. The flowers in the Kerry examples are about 15 mm. in diameter; the spur is usually entire, and in some cases shorter than in *grandiflora*; the calyx lobes obtuse, and the corolla scarcely so strongly veined nor the lobes so wide. The Kerry specimens gathered this year are much nearer *grandiflora*.

2056. STACHYS SYLVATICA L., var. IMMACULATA E. M. Cutting in Journ. Bot. 110, 1921. Chiefly differs from the type in the almost complete absence of the purplish streaks on the lower lip of the corolla, the whole plant being of a paler green. Shoreham, Kent, with the type. Is it a chlorotic condition?

2091. PLANTAGO MARITIMA L., var. PUBESCENS mihi. This differs from var. *lanosa* in the base of the leaves not being covered with white silvery hairs, by its being a larger plant (20 cm.), and by the leaves being covered with a short, dull-coloured pubescence. Ordale, Balta Sound, Shetland, 1920, DRUCE.

2092. P. LANCEOLATA L., var. ANTHOVIRIDE [sic] W. Watson in

Journ. Bot. 355, 1920. Thus, provisionally, Mr Watson has named a plant which is frequent in the Taunton district. It differs from the type in a slightly later flowering and greenish-yellow, longly elliptical stamens, which in the type are whitish and oblong-spheroidal.

2100 (4). P. PATAGONICA Jacq. Alien, Amer. bor. et austr. In a grass plot, Woking, Surrey, W. BIDDISCOMBE.

2104. HERNIARIA CILIATA Bab., var. ANGUSTIFOLIA Pugsley. In *Journ. Bot.* 180, 1921, Mr Pugsley, and assuredly correctly, claims precedence for his name over that given for the same plant in the *Cambridge Flora*.

†2123. CHENOPODIUM OPULIFOLIUM Schrad., var. MUCRONULATUM G. Beck. This is Mr Robinson's No. 419 from Watton, Norfolk, which he sent to the Botanical Exchange Club in 1918 as *C. opulifolium* × *album*, when I remarked that I could see no evidence of hybridity. Also sent from Bristol in 1921 by Mrs SANDWITH.

Var. OBTUSATUM Murr. Degenham, Essex, 1921, L. B. HALL.

2124. C. ALBUM L., by Dr J. MURR.

I. Plant mealy and therefore grey-green, glomerules large.

A. Leaves ovate to rhomboid, coarsely toothed ..... Grex ALBUM (L.).

1. Leaves elongate with almost parallel margins, distantly and slopingly toothed, very much like those of *Ch. ficifolium*, but larger, more rigid, and more sharply toothed ..... sub-sp. *subficifolium* J. Murr.

2. Leaves not elongate.

(a.) Inflorescence with finer branches, smaller glomerules. Leaves of only moderate size, irregularly biserrate, vaguely 3-lobed, thin almost like paper, grey-green or dark green (var. *pseudo-murale* J. Murr); a northern sub-species ..... sub-sp. *pseudo-opulifolium* J. B. Schulz (*suecicum* J. Murr).

(b.) Inflorescence pyramidal, spicate.

(*a.*) Leaves obtuse, biserrate-lobed, strongly mealy. Rare, in dry, sunny places of elevated habitats .... sub-sp. *borbasiiforme* J. Murr in the 50 Jahresbericht of the Mus.-Verein Bregenz, 1914.

(*b.*) Leaves obtuse or acute, irregularly coarsely serrate, more (var. *candicans* Lam.) or less mealy..... ..... sub-sp. *album* (L.).

B. Leaves elongate-lanceolate to ovate-lanceolate, entire, definitely green, but not bright green.

1. Inflorescence pyramidal, spicate Grex LANCEOLATUM (Muehlenberg).
   (a.) Plant robust, leaves lanceolate, dark green ..... sub-sp. *lanceolatum* Muehlenberg (1).
   (b.) Plant slender and more delicate; leaves smaller, bright grey-green, the upper sharply mucronate. Derived perhaps from East Asia sub-sp. *lanceolatiforme* J. Murr in Ascherson Festschrift (1904), p. 225.
2. Inflorescence racemose-umbellate (gleichgipfelich) Grex VIRIDE (L.).
   (a.) Leaves rather long-stalked, somewhat obtuse, dark green, inflorescences crowded. Rare, more common in the South ..... sub-sp. *pedunculare* Bert.
   (b.) Leaves shortly petiolate.
      (*a.*) Leaves shorter, in part almost rhomboid, with isolated very coarse teeth. Inflorescence only incompletely corymbose ..... sub-sp. *paucidens* J. Murr (2).
      (*b.*) Leaves entire, lanceolate to ovate-lanceolate.
         a. Leaves and entire plant succulent, rather deep green; glomerules large or very large; especially on loose, cultivated soil ..... sub-sp. *viride* (L.).
         b. Plant more delicate, much branched; leaves narrower, more grey-green; inflorescence very loose, racemose-umbellate, with small glomerules ..... sub-sp. *glomerulosum* Rchb. (3).

II. Plant more or less approaching the *Ch. striatum* (Kras.) J. Murr. Leaves green to bright green; stem markedly striped with red; glomerules smaller [than in I.] or quite small, more or less olive-green ... Grex EUCHLORUM J. Murr, 1921, *in litt.* ad Aellen

A. Leaves acuminate, ovate to rhomboid, coarsely toothed, almost green.
   1. Leaves longly acuminate; teeth coarse, nearly uniform, resembling the typ. *Ch. album* ..... sub-sp. *viridescens* St Amans. (= sub-sp. *praecutum* J. Murr = ? *Ch. paganum* Rchb.)
   2. Leaves, especially the lower, more shortly acuminate; teeth very large, the lower hooked. Much rarer ..... sub-sp. *bernburgense* Zschacke (4).

B. Leaves more or less obtuse, greener on the upper surface than in A.
   1. Leaves ovate to nearly triangular, coarsely but bluntly toothed (ausgebissen); glomerules of medium size, moderately grey. A robust, succulent plant, especially common in the South ..... sub-sp. *pseudo-Borbasii* J. Murr (5).

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1. In sub-sp. *pseudo-leptophyllum* J. Murr in Sched. (*Ch. leptophyllum* Murr, p.p. quoad pl. *tridentinum* of Nutt.), the leaves of the lateral branches exposed to the sun are very narrow, and the inflorescences are very mealy.

2. The sub-sp. *serratosinuatum* J. Murr in Sched. 1921, stands between sub-sp. *subficifolium* and sub-sp. *paucidens*.

3. This plant was at one time regarded, by me and others, as equivalent to *Ch. striatiforme* J. Murr; but from all the authentic specimens it appears to belong to the Grex *viride*.

4. Leaves large, almost trilobate, more sharply toothed; sub-sp. *trigonophyllum* J. Murr, Progr. Gymnas. Feldkirch, 1910 and 1911. *Ch. tridentinum* J. Murr is distinguishable by small olive-green glomerules.

5. Sub-sp. *interjectum* J. Murr stands between sub-sp. *pseudo-Borbasii* and sub-sp. *striatiforme*.

2. Leaves elongate-lanceolate, with almost parallel margins, mostly coarsely but bluntly toothed (ausgebissen); glomerules small, almost olive-green; seed very shiny; approaching *Ch. striatum*, but mostly not hybrid.

(a.) Plant more or less small and delicate.

(*a*). Inflorescence prolonged, spicate; branches long, flagelliform, decumbent; leaves rather mealy on the under side. A plant of dry banks and roadsides, more common in the South sub-sp. *striatiforme* J. Murr.

(*b*.) Inflorescence very loose, racemose-umbellate; erect habit. A plant of loose soil; it bears the same relation to sub-sp. *striatiforme* as sub-sp. *viride* does to sub-sp. *album*. Also occurs mostly in the South .... sub-sp. *concatenatum* Thuill.

(b.) Plant robust; tall.

(*a*). Leaves with sinuous, sharply toothed margins, the under surface the more mealy. A rarer form (passing into sub-sp. *viridescens*) sub-sp. *pseudo-striatum* Zschacke.

(*b*). Leaves clear green on both sides, very obtuse, and distantly and bluntly toothed. Differs from *Ch. striatum* only in the greater divergence of the leaf-margins, and in the larger and more mealy glomerules. Probably of re-crossed hybrid origin .... sub-sp. *substriatum* J. Murr in Vierteljahrheft für Geschichte u. Landeskunde von Vorarlberg, 1920, I. (as var. of sub-sp. *pseudo-striatum*).

CH. OPULIFOLIUM × ALBUM and CH. OPULIFOLIUM × STRIATUM.

I. Leaves markedly grey- or blue-green, rarely dark green. CH. OPULIFOLIUM × ALBUM.

A. Leaves, especially the upper ones, very obtuse, margin coarsely but bluntly toothed (ausgebessen).

1. Leaves rather dark green, ovate, flattened out anteriorly. The leaf resembles that of *Ch. opulifolium*, somewhat elongated and obtuse. (Probably a case of re-crossing.) .... *Ch. subopulifolium* J. Murr.

2. Leaves rather grey-green, very obtuse, and somewhat emarginate at the apex, margin deeply and elegantly doubly sinuous-toothed ..... *Ch. Borbasii* J. Murr.

3. Leaves extremely obtuse; the median lobe has parallel margins with isolated, coarse teeth, the lateral lobes are coarsely bipartite ..... *Ch. subquinquelobatum* J. Murr.

B. Leaves acuminate.

1. Leaves rather small, elongate-rhomboid, sharply mucronate, margin coarsely toothed (ausgebissen), with sharp lateral teeth; merges into *Ch. Borbasii*. It is a *Ch. opulifolium*, var. *mucronulatum*, with elongated leaves .... *Ch. Preissmanni* J. Murr.

2. Leaves large, triangular, deeply sinuate (ausgebissen) toothed, somewhat emarginate at the apex, rather green .... *Ch. platanoides* J. B. Scholz.

II. Leaves markedly bright green, although they are often somewhat mealy as well ..... CH. OPULIFOLIUM × STRIATUM.

1. All leaves triangular-ovate, broadly rounded anteriorly.

(a.) Leaves bright green, slightly toothed or almost entire .... *Ch. Ludwigii* J. Murr.

(b.) Leaves more mealy, margin bluntly sinuate toothed. Plant erect; flowering branches crowded .... *Ch. solitarium* J. Murr.

2. The larger leaves broadly triangular, coarsely and obtusely doubly toothed (much as in *Ch. platanoides*); the smaller lateral leaves ovate, very obtuse, with almost parallel margins ..... *Ch. tridentinum* J. Murr.

NEWLY INTRODUCED SPECIES OF THE ALBUM-GROUP.

CH. LEPTOPHYLLUM Nutt. resembles a narrow-leaved *Ch. album*, sub-sp. *lanceolatum*. Leaves linear-lanceolate to elongate-lanceolate (var. *oblongifolium* Wats.), mucronate; they, like the small, crowded inflorescences, are mostly densely mealy. (North America.)

CH. BERLANDIERI Moq. (*Zschackei* J. Murr) resembles an obtuse-leaved *Ch. opulifolium*. Leaves rhomboid to ovate, often indistinctly trilobed anteriorly (distinguishing it from *Ch. album*) clearly rounded but having at the same time a delicate sharp mucro; grey-green. (North America.)

CH. BERLANDIERI × ALBUM (*Ch. subcuneatum* J. Murr). Leaves acuminate from an ovate base, irregularly sinuately (wellig) toothed in the upper two-thirds, less clearly mucronate; not uncommon.

CH. STRIATUM (Kras.) Murr. Leaves like those of *Ch. ficifolium*, very obtuse, but the lateral lobes are only short or inconspicuous; green to bright green, almost shiny; the venation is anastomosing (*i.e.*, the ends of the lateral veins running parallel to the margins run into one another); often sinuately toothed. Branches flagelliform, brightly striped with red. Glomerules small; olive-green. (From Northern India; long established in Central Europe.)

CH. HIRCINUM Schrad. Closely allied to *Ch. ficifolium*. Leaves very variable; the lateral lobes are usually rather elongated and bipartite, and, like the inflorescence, are very mealy. Fetid smell. Generally smaller than *Ch. ficifolium* in all parts, and flowering later. (South America.)

CH. HIRCINUM × STRIATUM (*Ch. Haywardiae* J. Murr). Leaves resembling sometimes those of *striatum*, sometimes those of *hircinum*, but more incised than those of *Ch. hircinum*, and with usually shorter lateral lobes; green, but rather mealy; stem brightly striped red.

(The translation of this paper of Dr J. Murr we owe to the kindness of Dr S. H. Vines.)

†2131 (3). C. HIRCINUM Schrad., var. LATISSIMUM Murr ined. Bradford, Yorks, 1921, G. C. DRUCE and J. CRYER.

†2131 (4). C. BERLANDIERI Moq. × ALBUM L. = × C. SUBCUNEATUM Murr. Meanwood, Leeds, September 1921; Chipping Norton, Oxford, G. C. DRUCE.

2131 (4). C. DRUCEI mihi. *Ch. Berlandieri* × (*album-striatum*). Vorarlbergia: In ruderatis apud Josters pr. Feldkirch, viii., 1909. J. Murr. Accedit ad *Ch. Berlandieri* foliis circuitu fere ovalibus mucronulatis, glomerulis densis, etc.—ad *Ch. album* foliis inferioribus et mediis basi cuneatis deinde undulato-sinuatis (ut in *Ch. subcuneato* mihi)—ad *Ch. striatum* foliis omnibus saturate viridibus, subnitentibus, superioribus et nonnullis lateralibus marginibus sub-parallelis p.p. apice rotundatis, nervatura anastoma, glomerulis sub-olivaceis. Forsan ortum ex commixtione *Ch. Berlandieri* et *Ch. albi*, sub-sp. *pseudo-Borbasii* mihi aut sub-sp. *viridescenti* St Amans. It approaches *Ch. Berlandieri* in the nearly oval outline of its mucronulate leaves, and in its dense glomerules, etc.—[it approaches] *Ch. album* in that its lower and middle leaves are cuneate at the base becoming undulate-sinuate (as in *Ch. subcuneatum* mihi)—[it approaches] *Ch. striatum* in that all its leaves are deep green and somewhat shiny, the upper and some of the lateral leaves having sub-parallel margins and p.p. a rounded apex, with anastomosing venation, and in that the glomerules are sub-olivaceous. Possibly the plant has arisen from the crossing of *Ch. Berlandieri* with *Ch. album*, sub-sp. *pseudo-Borbasii* mihi or with the sub-sp. *viridescens* St Amans. J. MURR.

†2131 (13). C. QUINOA Willd. Sp. Pl. i., 1301. America, austral. Galashiels, Selkirk, Miss I. M. HAYWARD and G. C. DRUCE. A specimen (very incomplete) from Mr Grierson is near this or *C. Atriplicis* Linn. f. (? *purpurascens* Jacq.), teste Murr.

2135 (6). MONOLEPIS TRIFIDA Schrad. Ind. Sem. Hort. Gott. 4, 1830. Alien, Sibiria. Maryburgh, Lanark, and Bowling, Dumbarton, 1921, R. GRIERSON. Det. at Kew. *M. Nuttalliana* has been recorded for Britain. Perhaps they are synonymous.

†2210 (13). RUMEX PARAGUAYENSIS Parodi. Described at length

in *Rep. B.E.C.* 259, 1920, by A. Thellung. Alien, South America. Ware, Herts, 1914, DRUCE; Bristol, N. SANDWITH; Elland and Tingley, York, E. C. HORRELL; Glasgow, GRIERSON. Some, if not all, of the plants named in Britain as *R. dentatus* belong to this species, which in some respects recalls *R. pulcher*. It is difficult to assign its mode of introduction. Dr Thellung informs me that this South American alien has been recently described as *R. obovatus* Danser sp. nov. in *Nederl. Kruidk. Archief*, 1920 (1921), but Dr Thellung does not think it can be specifically separated from Parodi's plant.

2217. VISCUM ALBUM L. On Lime Trees. L. A. Boodle in *Kew Bulletin* 5, 212, 1921. It occurs on *T. europea* in the Oxford Botanic Garden.

2250. URTICA DIOICA L. The variation in leaf-shape of this species is well known, but recently I have seen forms with much rounder leaves than I had previously noticed. These I propose to call var. or sub-var. ROTUNDATA. I saw it at Barpham, Sussex W., in 1918, and Mr T. H. Green sent it from Twerton, Som. N., in that year. The leaf-measurements are as follows:—Middle of stem, $2\frac{1}{4}$ in. long by $2\frac{1}{2}$ in., deeply cordate; higher up, 27 in. from base of stem, $2\frac{1}{4}$ in. broad by 2 in.; upper leaves, 5 in. from apex of stem, $1\frac{1}{2}$ in. by 2 in. The leaves are densely hairy, almost rugose in texture, and coarsely toothed. There was no suspicion of hybridity with *urens*.

Forma INCISA mihi, with leaves deeply incised. La Haule, Jersey, 1919, DRUCE.

2312. CEPHALANTHERA RUBRA Rich. In the *Gard. Chron.* 109, 1921, Mr A. D. Webster, the author of *British Orchids*, says *C. rubra* has recently been reported from Gairloch, West Ross [surely an impossible occurrence; doubtless *Helleborine latifolia* or possibly *H. atropurpurea* is meant], but, he continues, "it is growing in some quantity at High Elms, where it was pointed out to me by the late Lord Avebury." Confirmation of this is most desirable, since I have talked over the Orchids with Lord Avebury, and he never mentioned such an interesting record. May it not be *Helleborine purpurata*, which grows there, or may it not have been planted in the grounds? Said to have been found in 1921 growing fairly freely in

the neighbourhood of Salisbury ("×" in *Salisbury and Winchester Journal*). In *Gard. Chron.* January 7, 1922, Mr A. D. Webster says he himself, with Mr Marshall Ward, saw *C. rubra* growing at the margin of the racecourse at High Elms.

2316. HELLEBORINE LATIFOLIA Druce. The Messrs Stephenson (*Journ. Bot.* 33, 1921) have a valuable paper on this plant, and on "*media*" and Linton's *atroviridis*. They show that *media* as a name must disappear. In this I cordially agree. The character derived from the more or less rugose-plicate bosses is too feeble and variable to afford a specific character; moreover, the name itself, as has already been shown, is faulty. Fries' *media* consisted of two species, each of which had been named previously. Linton's *atroviridis* is not a distinct species; in my List of 1908 I reduced it to a variety of *latifolia*. Babington's *media* was first correctly identified by him as *viridiflora*, but afterwards he wrongly named it *media*, as Col. Godfery points out. Of course, my var. *platyphylla* of *media* goes without a name into aggregate *latifolia*. Whether the narrow-leaved form of the latter is worth retaining is open for further investigation. The breadth of the leaf varies immensely.

2316 (3). H. LEPTOCHILA (Godfery). In *Journ. Bot.* 146, 1921, Colonel Godfery says the plant described as *Epipactis viridiflora*, var. *leptochila* (*Journ. Bot.* 37, 1919) is identical in its morphology and in the functions of the reproductive organs with *H. latifolia*; therefore, as there is no species under which it can be placed as a variety, he raises it to specific rank as *Epipactis leptochila* Godfr. Under this Messrs Stephenson put as vars. *dunensis* and *vectensis* (*l.c.*, 205, 1921).

2317. H. VIRIDIFLORA (Reichb.). Mr C. E. Salmon (*Journ. Bot.* 20, 1921) has a short note on this plant (as *Epipactis*) from E. and W. Gloucester and Monmouth, in which he thinks the forma *dunensis* may be worthy of varietal rank.

2317. EPIPACTIS VIRIDIFLORA Reichb. Since our note in last year's *Report* was written, it has been discovered by Col. Godfery that Mueller was mistaken in referring to this species the self-fertilising plants whose anatomy he investigated. Naturally,

Darwin (*Fertilisation of Orchids* 102) handed on the error. By search at Thorenc, where Mueller found his plants, Col. Godfery has proved that *Epipactis viridiflora* is after all just a cross-fertilised form of *E. latifolia*. It is, moreover, quite distinct from all three British self-fertilising forms, and has been named by Col. Godfery as *E. Muelleri* (*Journ. Bot.*, April 1921). It therefore becomes necessary to rename the British forms, and accordingly *E. viridiflora*, var. *leptochila* Godfery, now becomes *E. leptochila* Godfery, and the f. *vectensis* and f. *dunensis* named by us we now assign as *E. leptochila*, var. *vectensis* and var. *dunensis* (*Journ. Bot.* 146, May 1921, and 205, July 1921). Therefore, four self-fertilising forms of *Epipactis* have now been discovered, one in Switzerland and three in Britain. It is, however, probable that the new forms will in time be identified on the Continent. For instance, there is a dune form of *Epipactis* in Germany, of which we have specimens, which is almost certainly the same as our own; but in the dried state it is almost impossible to make out the exact form of the reproductive organs. T. & T. A. Stephenson.

2320. Orchid Seeds. The germination of the seeds was demonstrated by Mr J. Ramsbottom at the British Mycological Society on January 22, 1921, when he showed that they show no differentiation into plumule and radicle, but often possess larger cells at the suspensor end. The symbiotic fungus enters there, and the growing points of stem and root are situated at the further end of the seed. The root pushes its way through the tissues of the corm, but misses the fungal zone, and is free from the fungus on entering the soil. Later the fungus penetrates the root.

2325. Orchis latifolia L. In *Journ. Bot.* 1-7, 1921, the Rev. T. & Mr T. A. Stephenson discuss this plant. There is little doubt that the Linnean species, like so many others in the *Species Plantarum*, is a compound plant. Linnaeus started well; in the *Flora Suecica* he gave a description, contrasting it with *incarnata* on the one side and *maculata* on the other, but unfortunately, as was his custom, he added synonyms of plants which he had probably never seen, and which in many instances are quite different from the plant he had before him. In these cases it is wisest to ignore the synonyms and to keep to the descriptions, helped as they are

occasionally by geographical and stational clues. Therefore, we are constrained to limit *O. latifolia* L. to a plant with hollow stem, with leaves slightly (parum) spotted. The Linnean plant in his herbarium has broad flowers, the centre lobe rounded, bracts conspicuous, and leaves broadest in the middle. So far as British plants go, hitherto I have been unable to meet with plants which are identical with *O. latifolia* sent me from Sweden by Prof. Lindman and from Switzerland by Dr Keller. The Messrs Stephenson, however, consider Britain does yield *O. latifolia*, and they give a description and allude to four groups of which it consists. All of these seem likely to me to be hybrids of *O. praetermissa* with *maculata*, and its allies. Their *latifolia* is stated to have stems more or less hollow. I have found that the greater or smaller stem-cavity is almost uniformly associated with flowers approaching to or receding from *praetermissa*, and this is also true of the leaf-spots, the latter being of less specific value, since, as Messrs Stephenson remark, occasionally *maculata*, *Fuchsii*, and even *mascula* have unspotted leaves. I may add that the nearest approach to the Swedish *latifolia* was sent me from Selkirkshire; such as have been sent me from southern Britain seem to me to be allies or hybrids of *maculata*. It is usually not difficult to rightly prophecy that a certain paler-flowered Marsh Orchid growing with darker-flowered ones will have a stem whose central cavity is in proportion as its flower characters approach either parent. While thus frankly stating that I have yet to be convinced that true *latifolia* occurs in Britain, I am still inclined to hope for its appearance. These valuable researches of Messrs Stephenson may by many botanists be held to prove it. Botanists must be grateful to them for the painstaking and able work they are doing. Even if *latifolia*, British or foreign, should prove to be of hybrid origin, a name will be wanted to cover the enormous range of variation which is to be seen in aggregate *latifolia*, and this might be retained. We are glad also to see Messrs Stephenson refer to the variation in size of *maculata* and *Fuchsii* and to both growing even in sphagnum. In herbaria these large plants are often labelled *latifolia*. Among the flowers figured are *O. pratermissa*, *O. incarnata*, *O. purpurella*, *O. Fuchsii*, *O. latifolia*, and some hybrids. Bearing on this there is a suggestive statement by Sipkes (see *Journ. Bot.* 234, 1921) that, as to *O. latifolia*, he thinks that

in Holland it may be all or nearly *purpurella* hybrids, but leaves the question open for the present.

2325 (2). O. PRAETERMISSA Druce, and O. PURPURELLA Steph., in Holland. See "Two Orchids new to Holland," by C. SIPKES in *De Levende Natuur*, June 1921. The author makes no reference to the original description of *praetermissa*, but he saw Messrs Stephenson's good figures of the flower, and was enabled readily to identify it in several places, *i.e.*, near Castricum, Halfweg, Aalsmoor (Holland), Heille, Croede, and Oostkapelle (Zealand). The Hielle plant possesses a long narrow extension of the lip, which he described (*Kruid. Archief.* 1918) as *O. latifolia*, var. *macrantha*. He discusses the question of its being a possible hybrid, but says the most important argument against hybrid origin is that possible parents never grew near these specimens. As he has not seen my original paper, he is unaware of a still more important argument against hybridity there given, that it reproduced by seed offspring like the parent. He finds *O. purpurella* in South Limburg, near Epen, where it is very frequent. This plant, like *praetermissa*, was previously mistaken for *latifolia*. The hybrids from the Coul Valley are not, as he thought, *latifolia* × *maculata* (*O. Braunii*), but *purpurella* × *maculata*, and he thinks there is a possibility that all the Dutch *latifolia* are *purpurella* × *maculata*. Mr Sipkes thus independently has arrived at my suggestion regarding the English *latifolia*, that it is *praetermissa* × *maculata*, both these species being used in an aggregate sense—that is, that under *praetermissa* I include its var. *pulchella*, and sub-sp. *purpurella*, and under *maculata* come type *maculata* (*praecox*), *Fuchsii*, and *O. O'Kellyi*. Therefore, one need not wonder at the extreme variability of what passes as *O. latifolia* L., both in Holland and Britain. G. C. DRUCE.

2326 (3). O. PURPURELLA Stephenson. In the *Journ. Bot.* for July 1920 we described a new species of Marsh Orchis, under the name of *O. purpurella*. The lips of this form are figured in the same journal in November 1920, pl. 556, figs. 9 and 10 (coloured), and May 1921, pl. 559, figs. 9 and 10. See also *The Orchid Review*, December 1921. The chief points of distinction are (a) the deep, brilliant purple of the flowers; (b) the dwarf habit of by

far the most of the plants; (c) the leaf-spots, which are very small, often minute, and often present only at the tips, or more rarely at the bases of the leaves (as in all spotted species, a proportion of the plants is unspotted); (d) the pointed, almost, if not quite entire, diamond-shaped lip of the most typical form. We distinguished two forms, namely, form (a), with the diamond-shaped lip, and a lip-pattern of very heavy, broken lines of dark purple, and form (b), with more rounded and trifid lip, with small, rounded centre-lobe, and a pattern of rather narrower and more continuous lines, of the *latifolia* type. At that time we only knew form (a) from Aberystwyth, where we had had a field containing some hundreds of plants under observation for some years, and form (b) from Hawkshead, near Ambleside, and from the Isle of Arran. Since then Dr Druce has found form (a) at Port Madoc, and the species has been found in Holland by M. Sipkes. Some plants referred to *O. cruenta* from Cumberland and Durham also probably belong here. One possibility that had to be considered was whether the plant is *O. cruenta* O. F. Mueller. For some time we were unable to speak with finality upon this point, not having seen any living specimens of the latter, though our plant does not agree with the original plate (t. 876) in *Flora Danica*, nor with the description there given. Moreover, both Klinge and Ascherson & Graebner place the species in the closest connection with *O. incarnata*, in the latter case as a sub-species. We have recently examined a sheet of very well-preserved specimens in Dr Druce's herbarium, and can say confidently that *O. cruenta* is much nearer to *O. incarnata* than is *O. purpurella*. It has the same habit of leaves, and the same small flowers with recurved side-lobes of the lip, and a very similar lip-pattern. *O. purpurella* has broader leaves and a larger, flatter lip, with a very different pattern. *O. cruenta* has a more slender spur and a very different type of leaf-markings. As compared with the minute dots of *O. purpurella*, it has not only more heavy, angular markings, but also bright purple blotches on both sides of the leaves. Ascherson & Graebner also give a form B, *Seemenii*, dwarf (9-12 cm. high), with small flowers, almost entire, mostly of a dull (schmutzig) pale pink, the lip small, almost entire, with greenish marks. This form is given for the middle and North of Great Britain! What the form is, and how it got recorded for Britain, we have no idea. It is very

certain that we should not dream of making *O. purpurella* a subspecies of *O. incarnata*, from which it is markedly distinct. The question was carefully considered as to whether the plants were hybrids of some sort, and, as found in some situations, there are considerations which might point that way, but the group of plants growing at Aberystwyth, where there are some hundreds of specimens, all very true to type, as far as the flowers are concerned, of a rich, brilliant colour which could not have been produced by any crossing, far deeper and richer than any other type in the neighbourhood—we do not think these would be diagnosed as hybrids by any botanist who saw them on the spot. Moreover, they appear themselves to hybridise very readily with other forms, and we have determined with some certainty several intermediate forms, *O. purpurella*, form (a), with *O. latifolia* and *O. ericetorum*, and form (b) with the same two species and with *O. Fuchsii* and *Gymnadenia conopsea*. In the last case there are two types, one nearer one parent and one nearer the other, of which one is reproduced in the *Orchid Review* for November 1921. The two hybrids of form (a) are figured in the *Journ. Bot.*, November 1920, in the plate above referred to, figs. 11 and 12. In the *Journ. Bot.* for February 1922 we have named and briefly described these various hybrids, as follows:—1, × *O. insignis*, nobis = *O. purpurella* Stephenson × *O. latifolia* L.; 2, × *O. venusta*, nobis = *O. purpurella* Stephenson × *O. ericetorum* Linton; 3, × *O. venusta*, nobis = *O. purpurella* Stephenson × *O. Fuchsii* Druce; 4, × *Orchigymnadenia varia*, nobis = *O. purpurella* Stephenson × *Gymnadenia conopsea* R. Br. Of this two forms were found, type A being nearer to the *conopsea* parent, and type B being nearer to the *purpurella* parent. The last hybrid is only known from a very few specimens from Arran; but the other three are represented by a relatively large number of individuals in most localities in which *O. purpurella* has been found. They are so numerous, in fact, that it is most inconvenient not to have names for them. There is one other Marsh Orchis that must be mentioned in this connection. Dr Druce has long had under observation a plant which he has called "Northern *incarnata*." That plant he described in the *Rep. B.E.C.* for 1919 as *O. praetermissa*, leaving its exact status undetermined. When writing the paper on *O. purpurella* we had no acquaintance with this form in the field, only being sure from

the literature and specimens examined that the two were very nearly allied, as the argument of our paper will testify. However, this summer we were able to see *O. pulchella* in great beauty and fairly plentiful in the Isle of Arran, and there found it in several stations growing alongside *O. purpurella*, form (b), from which they only differed in being on the average a great deal larger, and without spots on the leaves. We found a fair number of dwarf plants without spots, and a few tall and slender plants with spots. Here, then, the two forms are commingling in some way, but, so far as present records serve, this does not often happen. At any rate, the fact that they are to be found in the main apart makes it desirable to retain the two names; but they should certainly be linked together as very close allies. They probably only differ by the presence or absence of the unit (Mendelian) characters for "leaf-spot" and "dwarfness." We suggest that they form a pair of species of a somewhat simpler type than those discussed in the interesting paper on "Pairs of Species," by Dr R. R. Gates, published in the *Botanical Gazette* for March 1916. We therefore venture to suggest that *O. pulchella* would be best separated from *O. praetermissa*, from which it differs in the colour-range and texture of the flowers, and the lip-pattern, and in its geographical distribution, as it appears almost entirely to displace the latter species in Scotland. T. & T. A. STEPHENSON.

Orchis cruenta was first recorded for Britain by Mr H. Goss from "the fells between Borrodale and Watendlath, Cumberland—alt. about 1000 feet" (*Journ. Bot.* 37, 1899), on Mr Rolfe's identification. I visited the place on two or three occasions, but was unable to see any plants answering to the description. Subsequently Mr Rolfe also named some specimens which I gathered near Middleton in Teesdale (see *Rep. B.E.C.* 521, 1910) as *O. cruenta*. These come under *O. purpurella* Stephenson. G. C. DRUCE.

2327. O. MACULATA L. In *Journ. Bot.* 305, 1921, Col. Godfery suggests replacing the name *O. ericetorum* Linton by that of *O. elodes* Grisebach in Ueber die Bildung des Torfs in den Emsmooren 25, 1846. There is nothing in the description to keep it apart from *O. maculata* L. as a species, and *elodes* may either sink in synonymy or be reduced to a variety if it is sufficiently distinct. Grisebach makes no mention of the important character of the size of the

side-lobes of the labellum. It will be noticed in this paper that Col. Godfery ignores the excellent description of *O. maculata* by Linnaeus and uses, as I think most unjustifiably, the name *maculata* in the sense of *Fuchsii*. He offers no explanation for this course, nor is his account of *O. elodes* itself exhaustive, *e.g.*, he has omitted to take any notice of Reichenbach's *O. elodes* Griseb. (see *Ic. Fl. Germ. et Helv.* xiii.-xiv., t. 406. Is the plant figured the restricted *ericetorum*?). His figures of the details of *O. maculata* show that both *Fuchsii* and *maculata* are included under the latter name. As to the occurrence of true *O. maculata* (*ericetorum*) on the continent, Col. Godfery does not appear to have taken the trouble to consult any of the great herbaria, which would easily have afforded the necessary information, or to have examined any extensive area. It was abundant on the moorland above Spa in Belgium in 1921. Indeed, the description of *O. maculata* in Lejeune & Courtois' *Comp. Fl. Belg.* excludes *Fuchsii*. One regrets to see such an untenable name suggested, which can only create confusion. I may add that when I was selecting a name for the basic-soil plant *O. elodes* was well considered by me as an equivalent for *ericetorum*, but was rejected. Both Dr Moss and myself were convinced that, as in the case of *Quercus Robur*, there was no doubt as to what Linnaeus meant when he described *maculata*, and that *Fuchsii* (or its equivalent) was to be separated. Miller took the same erroneous course as Col. Godfery suggests when he gave the name *Robur* to the sessile Oak and re-named (still-born) the true *Robur* as *Q. foemina*.

2327. O. MACULATA L. A paper on the forms of this plant by the Rev. T. Stephenson, D.D., and Mr T. A. Stephenson appears in *Journ. Bot.* 121, 1921. They treat of (1) *O. Fuchsii*, which they consider in some characters is intermediate between *O. latifolia* and *ericetorum*; (2) *O. O'Kellyi*, which they regard as a race (not a species) of *O. Fuchsii*; and (3) *O. maculata*, sub-sp. *ericetorum*. *O. maculata* is, as the authors say, an extremely variable species, yet by the segregation of *O. Fuchsii* the limitations are rendered much less difficult. Messrs Stephenson support what I have stated regarding the identity of Webster's *O. maculata praecox* and Linton's sub-sp. *O. ericetorum*. Both these authors argued from a much too limited amount of material. Neither of the names seem to me

necessary. Linnaeus, in his treatment of *O. maculata*, was not content in this instance with a descriptive phrase and a citation of synonyms more or less applicable to the species, but adds a descriptive footnote—" Petala 3 exteriora erecta, 2 interiora conniventa. Nectarii labium trifidum, planum: lobis lateralibus majoribus crenatis: intermedio angustissimo, integerrimo," which covers not only *praecox* and *ericetorum* but the recently disinterred *elodes* of Grisebach, which seems to me, in a specific sense, a still-born name. The specimen, too, in the Linnean Herbarium is *maculata*, not *Fuchsii*. As Messrs Stephenson well say, Webster and Linton " redescribed the Linnean *maculata*," doubtless led into this error by the plate in *English Botany*. I dissent from Messrs Stephenson's contention that the description of *maculata* in the foreign floras generally refers to *Fuchsii*. On the contrary, when the species is minutely described I think it will be found that *maculata* is indicated: often the description is so wide, and where both species are fairly common in the area under discussion this may have been intentionally done, as to cover both *Fuchsii* and *maculata*, which the authors may have thought to be forms of one variable species. May I say also that, if usage in one country or another is contrary to the original description of any species, it is invalid and must fail. With regard to *O. maculata*, such usage is not universal nor even general. In *Rep. B.E.C.* 99-108, 1914, I have shown how variable was the practice. Take, for instance, Archangeli *Fl. Ital.* 170, where the description is clearly not *Fuchsii*, and the same is true of Lejeune & Courtois' *Comp. F. Belg.*, Lloyd's *Flore de l'Ouest*, Bouvier *Fl. des Alpes*, Grenier & Godron *Fl. de France*, Post *Flora Syria, Palestine, and Sinai*, Brébisson *Fl. Normandie*, Rouy & Foucaud *Fl. de France*, etc.; whereas Koch *Fl. Germ.* and other authors give so vague a description that both species are covered. The authors of the paper give a whole-page illustration of the flowers of the palmate section—a most valuable addition to an important paper.

2327. O. MACULATA L., var. SUBINTEGRIFLORA Druce. Differs from the type by the labellum being nearly circular in outline, with a central shallow notch in which sometimes there is a very small and short central lobe rarely reaching the margin; the margin is entire, faintly cut, or slightly crenate. The markings are various, usually

dark purple on light lilac, and are usually in broken lines. Moors above Dolgelly, Merioneth.

[2333. OPHRYS BOTTERONI Chodat. Under this name my friend, Mr G. W. Harris, gave me specimens from the neighbourhood of Folkestone, but Prof. Chodat, to whom I sent them, does not admit them as his plant, but refers them to a form (which is common in Switzerland) of *arachnites* Lam. = *fuciflora* Reichb. This season further search will be made. In true *O. Botteroni* Chodat the inner sepals are petaloid.]

2335. O. APIFERA Huds. The Fertilisation of, by Col. M. J. Godfery, in *Journ. Bot.* 285, 1921. Contrary to preconceived belief, the author finds that it is mainly self-fertilised, although the plant is so specially organised for cross-pollination.

2338. HABENARIA GYMNADENIA × ORCHIS PURPURELLA. Under the combination *Gymnadenia conopsea* × *Orchis purpurella*, Messrs Stephenson in *The Orchid Review* 131, 1921, record the discovery of this hybrid in the Isle of Arran, and give a beautiful photograph of it. With it they found plants which they regard as hybrids of *O. purpurella* with *latifolia*, with *Fuchsii*, and with *O. ericetorum*.

†2380. LEUCOJUM PULCHELLUM Salisb. In March 1921 Mr P. M. Hall kindly sent me a specimen of a *Leucojum* which was said to be quite wild-looking in fields near Brightstone, in the Isle of Wight. I recognised it as the Balearic *L. pulchellum* and therefore went to Brightstone to see in what condition it grew. I soon found the field, in which there was a number of large clumps growing in and about a double hedge bordering a pasture field close to the village. These clumps were very luxuriant and covered with blossoms. In the field there were also plants of *Narcissus major* which, from these being in regular rows, dispelled any idea of either species being indigenous. Prolonged inquiry elicited the fact that both the *Leucojum* and *Narcissus* were planted some years ago by a schoolmaster, but that the former had considerably increased in number. Several gardens in the neighbourhood contained the *Leucojum*, and the villagers call it the Mountain Lily or Snowflake. G. C. DRUCE.

†*Gen.* 586 (5). MILLA Cav. Ic. ii., 76, t. 196, 1793.

†2392 (5). M. UNIFLORA R. Graham in Edinb. Phil. Journ. (833)

74; Bot. Mag., t. 3327. *Triteleia uniflora* Lindley Bot. Reg., t. 1293. Alien, Argentine. Hortal. Golf links, Grouville, Jersey, 1921, S. GUITON, ex T. ATTENBOROUGH.

†2409. SCILLA BIFOLIA L. I included a notice of this in "The Dubious Plants of Britain" (*Rep. B.E.C.* 789, 1919), and gave the following references to its supposed occurrence in Britain:—Teignmouth, Devon, Mrs Gulson, who "found only a few specimens which she brought into her garden, and that the plant was not now to be found in the neighbourhood."—Syme *Eng. Bot.* ix., 226. "Received from the West of England by Mr Sims, druggist, of Norwich. It is also in Buddle's herbarium (containing native species only)."—Sm. *Fl. Brit.* 365, 1800. The plate in Smith's *English Botany*, n. 24, is from a garden specimen. Its continental distribution is not adverse to its being a native in Britain; but so pleasing a plant is scarcely likely to have escaped observation. This year our good worker at Carmarthenshire plants, Mr D. Hamer, sent me a flower of this species which had been gathered in grass sward near the sea, a few feet above high water mark, on the Carmarthenshire coast. The exact locality is intentionally withheld. It is not a great distance from houses, and only two specimens were observed; thus its occurrence here may be adventive only. It would be interesting to know if it is grown in gardens in the neighbourhood. Perhaps investigation may discover it in greater quantity over a wider area.

†*Nat. Ord.* 91 (2). COMMELINACEAE.
Gen. 600 (5). COMMELINA (Plum.) L.
†2425 (5). C. COMMUNIS L. Alien, Asia. Leith Docks, Midlothian, September 1921, J. FRASER.

[2449. JUNCOIDES SYLVATICUM (Gaud.) Druce, var. JOANNIS-PRINCIPIS (Murr). *Luzula multiflora* × *sylvatica*. Frequent with the parents in Monte Rojaberg, prope Feldkirch, Austria, May 1921, J. MURR. This very interesting hybrid should be sought for in Britain, where both parents grow together. It has the strong growth and broad leaves of *sylvatica* with the inflorescence (modified) of *multiflora*.]

2506. POTAMOGETON OBTUSIFOLIUS M. & K., sub-sp. LACUSTRIS Pearsall, pat. et fils, in Journ Bot. 100, 1921, from the Lake District,

formerly (*Rep. B.E.C.* 841, 1919) recorded as *P. Sturrockii* Ar. Benn., but not the *Sturrockii* Ar. Benn. of *Scot. Nat.* 28, 1883.

2599. CAREX SPICULOSA Fries Bot. Notiser 99, 1843; Fries et Nylander Spic. Pl. Fenn. 21, 1844; Fries Sum. Veg. Scand. 226, 1846. *C. Goodenowii juncella* × *cuspidata* Almquist in Bot. Not. 18, 1891. *C. salina* × *vulgaris juncella* Hjell. Consp. Fl. Fenn. 285, 1895. *C. spiculosa* is recorded (Andersson *Cyp. Scand.* 41, 1849) by Nylander in promontorio maris albi arido Kuusokatka ad pagum Keret Lapponiae Rossicae. *C. salina*, var. *C. spiculosa* Richter Pl. Europ. 154, 1890. *C. salina*, var. *hebridensis* Ar. Benn. in Ann. Scot. Nat. Hist. 246, 1895, and 172, 1905. See also *Journ. Bot.* 252, 1897. The British locality is in North Harris, by brook at Loch Langavat, 2 miles north-west of Awhuimsuid, north of Obbe; covering a space about 2 or 3 yards long, by the same width, and among a sprinkling of heather above the brook. If there were any other Carices mixed with it I don't remember seeing them, but a little farther from the brook there were several Carices, where it was found by W. S. Duncan in 1895. Not being able to make this agree with any other *Carex* (than *spiculosa*), I felt dubious, as the rarity of the Finnish *Carex* seemed to exclude it, but I sent specimens to Dr Almquist, of Stockholm, who had worked at this section of the genus for many years. He replied—" 20/7/95.—Your *Carex* really resembles *spiculosa*, though, as you say, not exactly identical, and is undoubtedly the same hybrid." On this it seemed best to make it a var. of that species. The following references may be added:—Angström.—" Ytterligare underiältelser om botaniska resor i Skandriien af E. Fries Botaniska Notiser p. 51, 1844. *Carex spiculosa* Fries in Karelia keretina, Pergamo och Kalgolatis." Lang in Linnaea xxiv., 552, 1851.—" Cl. Friesius Cariciem spiculosam ad stirpem Caricis maritima refert, sed, ut mihi videtur, transitum optime facit a Cespitosis ad Salinas." AR. BENNETT. The chief difference between type *spiculosa* (which seems to be a hybrid and not a species) is in the elongated glume of the Scottish plant not being serrulate.

2611. C. REMOTA L., var. SUBLOLIACEA Asch. & Graebn. Syn. 67. *C. tenella* Sm., non *Engl. Fl.* iv., 83, 1828, non Schkuhr. " *C. remotiuscula* Willd." Don MS. *C. straminea* Don ?if of Willd.

Differs from the type in its much smaller and fewer-flowered spikelets with more silvery glumes. It is probably a condition of dry soils. Originally gathered by George Don in woods by the River Esk, Forfarshire, whence I have specimens (see *Don Memoir* 189, as *straminea*). Odiham, North Hants, 1880, Miss C. E. PALMER. Rozel, Jersey, 1851, J. PIQUET. Near Stoke Row, Oxfordshire, 1884; Riever Wood, Berks; Loch Coulin side, West Ross, 1882, DRUCE.

2628. C. PULICARIS L., forma MONTANA Pugsley in Journ. Bot. 106, 1921. Differs from the lowland form by its more erect fruit, smaller stature, shorter spikelets, with fewer flowers and more erect perigynia. It occurs in Aberdeen, Westerness, Mid Perth, Forfar, Somerset, Carnarvon, and Kerry, where I gathered it in 1875. This may also be the Helvellyn specimen gathered by Bentham in 1823. More recently Mr Pugsley has re-gathered it at Cwm Idwal.

†2641. SETARIA Beauv. Schinz & Thellung, *l.c.*, 258, admit the priority of the Lichen genus *Setaria* Acharius, but on the grounds of expediency they retain *Setaria* Beauv. for the grass genus, pointing out that the correct reference for the name is not (as given in the *Brit. Pl. List*) Flore d'Oware ii., 80, 1807. The name appears in the part which was not published until 1818. The first publication of the name was in the *Agrostographie* of 1812.

†2641. S. VERTICILLATA (L.) Beauv. Schinz & Thellung (*Viert. Nat. Ges. Zürich* 257, 1921) show that the earliest exact trivial is *verticillata*, dating from the second edition of *Sp. Pl.* 1762. Since the *Cynosurus paniceus* of L. Sp. Pl., 1753, is not this plant *paniceus* in the sense of *verticillata* must be abandoned.

2662 (11). S. BERTEROANUS (Trin.) Hitchcock & Chase in Contr. U.S. Nat. Herb. xviii., pt. 7, 370; 1917. Hitchcock in U.S. Dept. of Agric. Bull. No. 772, 150, fig. 84, 1920. Alien, America. Bradford, Yorks, 1919, J. CRYER.

†2665. ALOPECURUS BULBOSUS Gouan, var. MACROSTACHYUS Coss. Expl. Alg. *A. macrostachyus* Poir., ex Lam. Enc. Contrasts with the type—panicule spiciforme cylindrique à rameaux portant 4-6 épillets; glumes longues aiguës, libres, ciliées sur la carène; glumelle unique tronquée, 5 nerviée. Coast of Algeria, in wet

places. Its inflorescence, having fewer and larger spikelets, distinguishes it from the type. Alien. Espartal. Leith Docks, 1921, J. FRASER.

†2669. STIPA PENNATA L. See "Dubious Plants," *Rep. B.E.C.* 793, 1919. In Mr J. Piquet's herbarium there is a specimen labelled Georgetown, Jersey, 1850, but doubtless only a garden escape.

Gen. 649 (2). MUHLENBERGIA Schreb. Gen. 44, 1789.

2671 (10). M. RACEMOSA (Michx.) B. S. P. (*M. glomerata* Trin.). Alien, Amer. bor. Glasgow, 1921, R. GRIERSON.

2685. AGROSTIS TENUIS Sibth. Fl. Oxon 36, 1794. The Latin name for the Common Bent Grass for many years in general use in Britain was *A. vulgaris* With. Arr. ii., 132, 1796; indeed, as such it appeared in the ninth edition of the *London Catalogue* of 1895. In the *Flora of Berkshire* of 1897 I showed that Sibthorp's name had priority, under which it appears in the *British Plant List* of 1908. Richter (no doubt unintentionally) gave a false priority to Withering's name by attributing the date of publication to the edition of 1776, in which the name is not to be found. There is now another claimant brought in by Schinz & Thellung (*l.c.*, 261, 1921). This is *Agrostis capillaris* L. Sp. Pl. 62, 1753, a name used for it by Hudson (*Fl. Anglica* 27, 1762), by Leers (*Fl. Herborn.* 20, t. iv., f. 3), Stillingfleet, Villars (*Fl. Dauph.* ii., 73), and other authors. More recently Hitchcock, the well-known authority on the Grasses of North America (U.S. Dept. of Agric., No. 772, 129, 1820), showed that this name was applicable to the Common Bent and not to the Spanish and Portuguese plant, the *A. delicatula* of Pourret, to which Richter and other botanists had applied it, despite the fact of the Linnean diagnosis being unsuited. Linnaeus, moreover, gives as its habitat "in Europae pratis," and cites *Flora Lapponica* and *Flora Carniolica*, neither countries being the home of *delicatula* Pourret, though the Bent Grass occurs in both. Nyman (*Consp.* 802) cites *A. capillaris* L. as *A. vulgaris* With., p.p. Smith (*Eng. Fl.* i., 93) unjustly gives priority to *vulgaris* rather than to *tenuis*, and says (on wrong authority?) that *A. capillaris* L. is "a totally different plant found in Portugal." Accepting this decision of Hitchcock and Schinz & Thellung as valid (awkward as it will be to agricul-

turists), the name of the Common Bent must be *A. capillaris* L., while the Iberian plant is the *A. delicatula* Pourret. *A. capillaris* L. is a rather variable species, of which the following are the chief varieties :—

Var. NIGRA (With.). A strong, coarse grass, somewhat intermediate between *capillaris* and the plant generally known as *A. alba*, with prominent oblong, truncate ligule; the panicle-branches constantly erect-patent, bare of flowers below; the florets larger; the glumes relatively longer than the palea; the lower glume more strongly serrulate for half its whole length (in the type a third of the whole length); the leaf-sheath slightly rough, and in its taller growth and more robust habit. Thus in the ligule it approaches *A. alba*.

Var. HUMILIS (Asch. & Graebn.).

Var. PUMILA (L.). Caespitose; plant very small; florets infested with *Tilletia sphaerococca*, to which its characters are said to be due. General Munro considered it to be a good species, but it is said to revert if the smut is destroyed. Confirmative evidence on this point is needed.

Var. DUBIA (DC.) = var. ARISTATA Parnell, an awned form, is not very rare. It is possible that some of the awned forms are hybrids with *canina*.

Var. STOLONIFERA (Koch Syn. 782), with long, creeping stolons. Sandy places. This is in part the *A. stolonifera* L.

Var. ALPIGENA (Schur Enum. Transs. 723). To this I refer some plants gathered on the Cairngorm in 1919 having a short, ovoid panicle of small, dark-coloured spikelets, the panicle branches and peduncles slightly scabrous.

2687. A. CANINA L., var. PALLIDA Reichb. = sub-var. PALLIDA Druce Rep. B.E.C. 312, 1918. Methven, Perth, DRUCE.

2687. A. CANINA L., var. MONTANA Hartm. Cairngorm, Easterness, 1919, G. C. DRUCE.

†2719. AVENA STRIGOSA Schreb., segregates. No mention is made of *Avena strigosa* in this country in the two early botanical works, Ray's *Synopsis* (1724) or Hudson's *Flora Anglica* (1762), though in the former four cultivated types of *A. sativa*, besides *A.*

nuda, are enumerated. In Linnaeus' *Systema Plantarum* (1791) the species is described "panicula oblonga contracta secunda: flosculis geminis biaristatis; dorsa arista geniculata," and quoted from Schreber's *Spic. Fl. Lips.* p. 52. In Smith's *Flora Britannica* (1800) it is referred to as not indigenous. At the present time, apart from being a widely-distributed weed in cornfields, *A. strigosa* in its un-improved state is grown as a crop at the extreme limits of cereal cultivation in the mountainous districts of Wales, and also in the Shetland Islands, Orkneys, and some of the Hebrides (e.g., Tiree), under climatic and soil conditions in which other varieties of Oats cannot be profitably grown. A number of different lots of seed have been obtained from all these various sources, and during the past three years many hundreds of plants have been bred and critically examined by the writer. The result of this research has convinced the writer that three distinct types have been included under the aggregate name *A. strigosa* Schreber. Not having access to large libraries at the time of writing, I have been unable to consult some continental works, but so far as I am aware the species has hitherto not been sub-divided, and no varieties have been described. The three types are perfectly constant when grown from seed, and all their characters are unaffected by environment. I therefore propose sub-specific rank for these types, and suggest the names appended to the descriptions below. The flowers of *Avena strigosa* are very rarely cross-pollinated, and as yet no natural crosses between these sub-species have been observed. There are several varieties of these sub-species, distinguished by the colour of the outer palea when ripe; these appear to be comparable to the colour varieties of *A. fatua* L. and *A. sterilis* L. and their cultivated derivatives.

AVENA STRIGOSA Schreber, sup-species PILOSA mihi. Margo laminae ciliata. Palea inferior tota pilosa; circa 20 mm. longum habet. Young plants sub-prostrate, later becoming erect, but leaves spreading, leaf-sheaths pubescent. *Cilia on the margins of the lamina* extending from the ligule to near the apex. Outer palea of both flowers clothed with long, stiff, ascending *hairs over practically the whole of its surface.* Axis at point of attachment of lower grain practically glabrous (occasionally a few extremely short, white hairs present). Apex of rachilla of lower grain provided with a

dense bifurcated tuft of white hairs. Average length of outer palea from the callus at base to the apex of the two hair points when ripe, 20 mm.

Var. *alba*. Outer palea whitish in colour when the grain is ripe.

Var. *fusca*. Outer palea streaked longitudinally with narrow lines of light colour over the vascular bundles, and grey on the intervening tissue.

Almost always present with sub-species *glabrescens* as a crop in Wales, and elsewhere as a cornfield weed, var. *fusca* being the more common variety.

Sub-species GLABRESCENS mihi. Margo laminae ciliata. Planta erectior quam sub-sp. *pilosa*. Palea inferior epilosa; circa 19 mm. longum habet.

Young plants sub-prostrate, afterwards erect; leaves sub-erect at time of emergence of panicles. *Marginal cilia* from the ligule to near the apex of the lamina. Outer palea of all grains *entirely glabrous*. Base of lower grain also glabrous, but apex of rachilla with a bifurcated tuft of light-coloured hairs (just below the point of attachment of the upper grain). Average length of outer palea from callus at its base to the apex of the two hair points, when ripe, 19 mm.

Var. *albida*. Outer palea yellowish-white, with no indication of longitudinal streaking when ripe.

Var. *cambrica*. Outer palea of grain when ripe longitudinally streaked with dark grey and yellowish-white; the light-coloured stripes being narrow, over the vascular bundles only, the darker ones occupying the intervening tissue.

The prevailing sub-species in Wales, but also widely distributed in Britain, var. *cambrica* is the more common variety; var. *albida*, however, frequently accompanies it.

Sub-species ORCADENSIS mihi. Margo laminae non ciliata. Palea inferior, matura, ab arista ad apice pilosa; circa 17 mm. longum habet.

Young plants sub-prostrate and leaf-sheaths pubescent, as in the two foregoing sub-species, but there are *no marginal cilia* on the laminae. Outer palea of both grains *scantily clothed with stiff*

ascending hairs from immediately below *the point of attachment of the awn to near the base of the two apical hair points.* Whole of the remainder of the outer palea below the attachment of the awn *entirely glabrous.* Grain more nearly ovate than either of the two sub-species described above, although the apical hair points are as long. Apex of rachilla of lower grain bearing a small tuft of short hairs. Average length of lower grain when ripe, from callus at base to apex of two hair points, 17 mm. When growing under the same conditions this sub-species flowers and ripens its seed earlier than the sub-species *pilosa* and *glabrescens.*

Var. *flava.* Outer palea of ripe grain yellowish, not streaked with darker colour. Hairs at the base of the lower grain very short.

Var. *intermedia.* Outer palea streaked longitudinally with greyish-brown stripes, covering the space between the vascular bundles, over which alone are lines of a yellowish colour.

Var. *nigra.* Outer palea of ripe grain completely black or with extremely narrow longitudinal stripes of slightly lighter colour immediately over the vascular bundles.

Apparently almost confined to the north of Scotland, var. *intermedia* is the most common variety, var. *nigra* frequent, but var. *flava* only occasionally met with.

It may be mentioned that, despite repeated attempts, I have so far been unsuccessful in producing crosses between any of the varieties of *Avena strigosa* and other species of the genus, whereas artificial crosses between *A. fatua*, *A. sterilis*, *A. sativa*, and *A. nuda* have been obtained comparatively easily. This is perhaps less surprising in view of the recent work of Hitoshi Kihara in Japan. He has found the diploid number of chromosomes in *A. strigosa* to be 14, while that of *A. fatua*, *A. sativa*, and *A. sterilis* is 42. He suggests that *A. strigosa* is the most primitive of these species and may have given rise to *A. barbata*, the somatic nuclei of which have 28 chromosomes. It is not possible at present to say whether the three sub-species and varieties described above differ in this respect, but a thorough cytological investigation is in progress at the time of writing, accompanying genetical analysis of all these types by inter-crossing. C. V. B. MARQUAND.

†2720. A. STERILIS L. To this species Marquand refers the plant described by Hackel (*Rep. B.E.C.* 37, 1911) as *A. sativa* L., nova forma *glumaris*. I gathered it at Port Meadow, Oxon, in 1910, but it did not reappear. Hackel said it was a form previously unknown to him, approaching by its long sterile glumes *A. longiglumis* Dur., but quite distinct from it. *A. sativa*, forma *glumaris*, thus sinks in synonymy. I have *A. sterilis* also from Acton, Middlesex, and Colchester, Essex. G. C. DRUCE.

2743. KOELERIA VALLESIANA Bertol., ex Roemer & Schultes Mant. ii., 346, 1824 (as *valesiana*, prececes, teste Schinz & Thell.) Ascherson & Graebner as the authority.

2761. POA TRIVIALIS L., var. SEPTENTRIONALIS nov. var. In Shetland the common form of the above species appears to be a different race from the southern plant. For this variation the above name is suggested. Its chief features are that it produces more of the elongate aestival barren shoots from the base of the stem. Sometimes these are prostrate and give it the appearance of *pratensis*, sometimes ascending. Should this latter character be retained in culture the plant must be of superior economic value. The chief differences, however, are in the panicle branches and spikelets. The colour of these is a rich, dark violet-brown, but since it is only the centre of each glume and pale which is coloured while the tips have a broad silvery hyaline margin, a variegated appearance is given. The glumes are about 15 per cent. longer and about 20 per cent. broader than those of the type. The mid-rib is more prominent and is practically glabrous. From the larger florets and slightly shorter flower stalks the effect is given of a more crowded and a more luxuriant panicle. In Shetland, at Lerwick, North Roe, Ronas Voe, Unst, Norwick, Balta Sound, Burrafirth, Uyea Sound, Bressay. A closely allied plant occurs in western Ross-shire. Mr Murray, of Messrs Sutton's, who has had considerable experience with *trivialis*, tells me that none of their examples, whether grown from wild or cultivated seeds, have such large glumes, even when compared with luxuriant examples, and he thinks it worthy of varietal rank.

2811. BROMUS HORDEACEUS L., var. PSEUDORA CEMOSUS Asch. & Graebn. Syn. Alien? Near the Railway Station, Killin, Mid

Perth, 1920, J. FRASER; Glasgow, 1921, R. GRIERSON; Port Patrick, Wigton, J. FRASER. An attractive variety from the broad membranous border to the glumes and by its neat-looking glabrescent spikelets. Named at Kew, but placed under sub-sp. *leptostachys* Pers. by Dr THELLUNG. I think it deserves a varietal name.

2845. PHOLIURUS Trin., vice LEPTURUS Br. Hitchcock (U.S. Department of Agriculture Bull. No. 772, 105, 1920) rightly points out that *Lepturus* Br. = *Monerma* Beauv., having only a single glume in the spikelet. Trinius expanded the genus by including species of *Lepturus* having two glumes. If, as is now commonly done, the two genera are to be kept separate—then, according to the Internat. Rules, Art. 45, the name *Lepturus* can only be retained in its original sense for *Monerma*, and cannot, as is frequently and erroneously done in modern times, be retained for the species having two glumes. The name *Lepturus*, auct. rec., should be replaced by *Pholiurus* Beauv., sens. ampl. (em. Hitchcock). The species, which has made its appearance in Switzerland, they regard as specifically different from *Pholiurus incurvus*, comb. nov., and have given it the name *Ph. filiformis* (Roth) Schinz & Thell. (see *l.c.*, 265).

2848. HORDEUM NODOSUM L., var. BREVISUBULATUM (Trin.) Thell. Alien. Greenford, Middlesex, 1917, COOPER, ex G. C. BROWN. Thellung says, under *H. secalinum* Trinius (*Sp. Gram.* i., 1828, t. 4), planta paullum nota e Sibiria descripta.

†2854 (4). H. TRIFURCATUM Jacq., ex Baillon in Bull. Soc. Bot. Fr. i., 187, 1854. Alien. Glasgow, R. GRIERSON.

2885. ASPLENIUM ADIANTUM-NIGRUM L., var. CAUDIFOLIUM. Found by Mr Druery in 1883 in great abundance on a stretch of stone dyke on Dartmoor. It persists, and was again found in profusion in 1913.

2912. ANAGRAMMA LEPTOPHYLLA Christ. (*Gymnogramma*). R. T. Lynch (*Gard. Chron.* 211, 1921) states that he sowed "a good fat packet of spores," obtained from plants grown at Cambridge, "down the water lane which leads from near St Martin's to the sea . . . the only indiscretion of the kind I ever committed." If it appears there its origin is thus accounted for.

NOTES ON PUBLICATIONS, NEW BOOKS, ETC., 1921.

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

ALMQUIST, E. Studies of *Capsella Bursa-pastoris*, in Acta Hort. Berg. 45-95, 1921, with figures. See p. 273.

ALMQUIST, S. Roses in the Swedish Herbaria. See p. 278.

ARNOLD ARBORETUM, JOURNAL OF THE. Edited by C. Sprague Sargent. Vol. ii., 1920. Riverside Press, Cambridge (Mass.).

ARTSCHWAGWER, E., Ph.D., and SMILEY, EDWINA. DICTIONARY OF BOTANICAL EQUIVALENTS: French-English and German-English. Williams & Wilkins, Baltimore; 2.25 dols.

BEGUINOT, AUGUSTO. LA BOTANICA. pp. 116. Roma, 1920; 3.50 lire.

BEWS, Prof. J. W. AN INTRODUCTION TO THE FLORA OF NATAL AND ZULULAND. pp. vi., 248. Wheldon & Wesley, London; 15/-.

BLACK'S GARDENING DICTIONARY. Edited by E. T. Ellis, and arranged in alphabetical order. A. & C. Black, 4-6 Soho Square, London, 1921; 15/-.

BLACKBURN, K. B., and HARRISON, J. W. H. The Status of the British Rose Forms, etc., in Annals of Botany, vol. xxxv., 159, 1921.

BLATTER, ETHELBERT S. J., F.L.S. FLORA ARABICA. Pt. ii., Leguminosae to Compositae; pp. 121-282. Rec. Bot. Soc. of India viii., n. 3. Calcutta, 1921.

BOODLE, L. A. Mistletoe on Lime-trees, in Kew Bulletin, n. 5, 212, 1921.

BOSE, G. C. A MANUAL OF INDIAN BOTANY. pp. xvi., 368, tt. 8. Blackie & Son, London, Bombay, and Glasgow; 7/6.

BRENCHLEY, WINIFRED E. WEEDS OF FARM LAND. pp. 239, tt. 41. Longmans, Green & Co., London, 1920; 12/6. This is a most valuable, useful, and practical work, which should be in the possession of every agriculturist. In 13 chapters the subject is adequately dealt with, and a mass of information placed before the reader in a pleasing guise. In Britain, where there is no such rich endowment of agricultural study as is possessed by the Department of Agriculture at Washington, with its enormous output of literature, we are necessarily much behind in the scientific treatment of farm pests. This work will therefore give a much-needed help to those to whom the undue presence of weeds may materially alter the yearly balance-sheet for the worse. During the war much hasty and wasteful change of land from pasture to arable was insisted on by not too well-informed officials. Had the same amount of energy and expenditure been made in clearing the existing arable from weeds, in hedge-cutting, and in better and more complete ploughing, both the nation and the agriculturist would have been greatly the richer. At the present time, with the ruinous cost of production, farmers are too apt to allow weeds to increase owing to the high price of labour, but he may gather how necessary it is in an economic sense to subdue their number, and may obtain most useful help from Miss Brenchley's book, and will be led to see the importance of clearing his crops of many pernicious pests. Among these are the grass *Alopecurus agrestis* (its old and more correct name is *A. myosuroides*). Chapter 2 treats of the Distribution of Weeds. Many, of course, are brought in the seeds of the various crops; manure brings others; the mud on cart-wheels, as the Rev. A. Woodruffe Peacock has shown, is a responsible agent for the introduction of others (*Juncus tenuis* is thus spread), and storm currents, as Mr Peacock points out, convey seeds and parts of plants for a considerable distance. Many weeds are prolific seeders. Among these may be mentioned *Polygonum aviculare* (this rampaged over the devastated areas of Flanders and France), *Anagallis arvensis*, *Cerastium viscosum*, *Stellaria media*, the Speedwells, *Brassica arvensis* (the authoress uses the less correct name *B. Sinapis*, which does not retain the oldest trivial), the Dodders, Poppies, and Shepherd's Purse. Reference is also made to those plants having specialised seeds for wind or animal dispersion. Birds are themselves agents for the spread of many plants owing to the

enormous number of seeds which are eaten by them, a large percentage of which pass uninjured through the alimentary canal. In other cases the creeping roots themselves are apt to break up under agricultural operations, and thus the spread of *Convolvulus arvensis* and *Arrhenatherum tuberosum* (to which only varietal grade is given) is to be accounted for. This year in Shetland a farmer told me he had cleared two tons of the Onion Twitch from a small croft where it abounded. Chapter 3, on the Prevention and Eradication of Weeds, is eminently useful and practical. Thistles, it is said, may be destroyed by three cuttings each year, while a field infested with *Genista tinctoria* had better be converted into arable, as ordinary methods prove useless against this deep-rooted nuisance, which stock refuse to eat. I have—perhaps fortunately—failed to grow it in my garden. Iron sulphate in a 5 per cent. spray proves effectual in destroying Bracken, while lime is most useful in killing the acid-loving *Rumex Acetosella*. In Chapter 4 are quoted the results obtained by a Committee of the British Association in 1857 in testing the vitality of seeds over prolonged periods. Furze germinated when 15 years old, but a much longer period is claimed for its vitality, for 25 years was said to be proved in Cumberland by J. Parkin. At present we are still deficient in the precise knowledge of the vitality of buried seeds. The popular mind is always ready to accept "mummy wheat" and "buried henbane" centuries old, but Miss Brenchley herself gives the results of many carefully-conducted experiments, which greatly extend our knowledge of the age of seed-vitality. Not only birds but animals assist in the distribution of weeds since they are also voracious devourers of seeding plants. A cow was estimated to have eaten during the day 89,000 seeds of Plantain and 564,000 seeds of Camomile, of which 87,000 of the former and 198,000 of the latter passed through uninjured. Fifty per cent. of seeds capable of germination of *Chenopodium album* and *Rumex Acetosella* also were voided by a pig. We have shown in the *Adventitious Flora of Tweedside* how strong, hot solution of caustic soda, and of sulphuric acid did not kill the seeds of Medics or *Chenopodium*, nor do the moist fermenting heaps of manure destroy *Chenopodium album*, *ficifolium*, or *rubrum*, which are often seen in masses on those reeking heaps, and the same, too, is true of *Polygonum Persicaria* (which throughout is mis-spelled *Persecarea*),

and Rumices. Chapter 5 is devoted to the Habits of Weeds, and Chapter 6 to Parasites, among which Dodder and Broom-rape are the worst. The careful screening of the seed is strongly recommended—it is better to prevent than cure. Chapter 7 is on Poisonous and Injurious Weeds. Among the former one is surprised to find *Pteridium*, *Brassica arvensis*, *Raphanus Raphanistrum*, *Anagallis*, and the suspected *Nepeta Glechoma*. However, what is one man's meat is another man's poison, since Shepherd's Purse is said to have caused the death of two children who had eaten the tops, and yet it has been grown as a salad in America. Surely the deaths in this case were an instance of idiosyncrasy. Perhaps the so-called poisonous properties of *Equisetum* are caused by mechanical irritation of the mucous membrane due to the rough silicious structure of the plant rather than to any toxic principle, just as the irritation of the lungs by silicious particles in the case of granite and flint workers allows the ready entry of tuberculosis germs. Instances of death of cattle from eating *E. palustre* have recently occurred in Oxfordshire. Chapters 8 and 9 —Arable Weeds and Associations with Soils—are suggestive and helpful. *Arabis Thaliana* (*Sisymbrium Thalianum*) is said to be rare in arable soils in Bedfordshire; it is, however, frequent in light sandy soils in Berks, Bucks, and Oxfordshire. Morison (*Hist. Ox.* ii., 235, 1680) says "provenit in agris frumentaceis humidis passim circa Oxonium," but it is practically absent from the cold clays and chalk. A series of tables are given to show the percentage of frequency of certain weeds in root and other crops, those which are most frequent in cereal and root-crops, and those which seem to shun them. Grassland weeds are dealt with in Chapter 11, and the Uses of Weeds in Chapter 12, while the Popular and Local Names are given in the concluding chapter. The illustrations are a useful feature. Miss Brenchley is to be heartily congratulated upon this compact and handy publication.

BRITISH ASSOCIATION: Edinburgh Meeting. Presidential Address on The Present Position of the Theory of Descent in Relation to the Early History of Plants. The papers read included one on The Distribution of Certain Elements in the British Flora, by Mr Matthews. Origin of the Moss Rose, Major C. C. Hurst—"Only

differs from the old Cabbage Rose in multiple branching of its gland structures." The popular lecture was on Graft Hybrids by Prof. F. E. Weiss. Factors of Evolution, Dr J. P. Lotsy—" The species concept remains an abstraction. Nature consists of individuals; similar individuals form syngameons, and these have been mistaken for species. . . . The only transmissible changes proved to occur are the results of crossing. These changes transgress the limits of Linnean species."

BRITTEN, JAMES. Thomas Walter and his Grass, in Journ. Bot. 69, 1921. The Compendium of Smith's English Flora (and Aeneas MacIntyre), *l.c.*, 176, 1921.

BRITTON, N. LORD, and ROSE, J. N. THE CACTACEAE. Vol. ii., Cereeae, with 40 coloured plates, 305 illust., 4to. The Carnegie Institute of Washington, 1920; £7 10s.

BROWN, N. E. New Plants from Tropical South Africa, collected by Archdeacon F. A. Rogers (the son of our Rubi specialist, the late Rev. W. Moyle Rogers), in Kew Bulletin, n. 8, 289, 1921. Mr Brown has named five species after him.

BROWN, N. E. History of the Cape Aloe (*A. spicata* Thunb.) in Gard. Chron. 6 and 16, 1921. Mr Brown shows that the plant figured in Bentley & Trimen's *Medicinal Plants* as *spicata*, and the plant described by Baker under that name in the *Flora Capensis* vi., 316, is an Abyssinian species which is specifically different from Thunberg's plant.

BROWNE, LADY I. M. P. Anatomy of the Cone and Fertile Stem of *Equisetum*, in Annals of Botany, vol. xxxv., 427, 1921.

BULLEY, A. K. Alpine Plants on Snowdon, in Kew Bulletin, No. 8, 319, 1921. It is to be sincerely hoped that the most reprehensible idea of sowing exotic plants on this or any other British Mountain may not be carried into effect.

BUNZO, HAYATA. BUNZO ICONES PLANTARUM FORMOSONARUM NECNON ET CONTRIBUTIONES AD FLORAM FORMOSANAM. Vol. 10, pp. iv., 335, 1921; with an index to the 10 volumes, in which 170

families, 1197 genera, and 3658 species are described, 1200 species being new.

BURTT-DAVY, JOSEPH. New or Noteworthy South African Plants, in Kew Bulletin, n. 2, 40, 1921.

CARNEGIE INSTITUTE. Classified List of Publications of the Carnegie Institution of Washington. Washington, February 15, 1921.

CHAMBERLAIN, C. J. Grouping and Mutation in *Botrychium*, in Bot. Gazette 387, 1920.

CHEVALIER, AUG. EXPLOITATION BOTANIQUE DE L'AFRIQUE OCCIDENTALE FRANCAISE. Tome 1, Enumeration des Plantes récoltées; pp. 795. Paris, 1920; 60 fr.

CHURCH, A. H., F.R.S. ELEMENTARY NOTES ON THE SYSTEMATY OF ANGIOSPERMS. Bot. Mon., No. xi. Clarendon Press, 1921; 3/6.

CLARKE, W. G., F.G.S. Norfolk Topography in the Botanist's Guide of 1805, in Trans. Norf. and Norw. Nat. Soc. xii., pt. 2, 179, 1920-1. An excellent contribution.

CLARKE, W. G., F.G.S., and GURNEY, R., M.A., F.Z.S. Notes on the Genus *Utricularia* and its Distribution in Norfolk, in Trans. Norf. and Norw. Nat. Soc. xi., pt. 2, 128, 1920-21. See p. 300.

CLAUSSEN, J. Studies on the Collective Species of *Viola tricolor* L., with 3 plates, in Botan. Tidsskrift Copenhagen, binds 37, hefte 3, p. 205, 1921.

CLIFFORD, Sir HUGH. Botanic Gardens, Victoria, Nigeria. Address to the Nigerian Council, December 29, 1920. Draws especial attention to the importance of keeping these gardens in a high state of efficiency on account of the service they may be to the Colony.

COOK, Dr M. T. COLLEGE BOTANY: STRUCTURE, PHYSIOLOGY, AND ECONOMICS OF PLANTS. pp. x., 392. J. B. Lippincott & Co., Philadelphia & London; 12/6.

CRABTREE, J. H. ROCKS AND FOSSILS AND HOW TO IDENTIFY THEM: a companion volume to Grasses and Rushes, British Ferns, and Woodland Trees. pp. 62, with many plates. The Epworth Press; 1/9.

CURTIS, JOHN WRIGHT (1814-64): His Herbarium. C. E. Salmon in Gard. Chron. 15, 1921.

DARWIN, FRANCIS. Studies in Phaenology, No. 1920, in New Phytologist 30, 1921. The flowering of 272 species is noted for the four years 1917-1920.

DENSMORE, Prof. HIRAM D. GENERAL BOTANY FOR UNIVERSITIES AND COLLEGES. pp. xii., 459. Ginn & Co., Boston and London, 1920; 12/6.

DENT, Mrs, and THE WILD FLOWER MAGAZINE. The twenty-fifth year of this popular Magazine was felt to be a happy opportunity on the part of its members, under the auspices of Miss A. B. Cobbe, to present its founder, Mrs Dent, with a handsome and artistic silver rose bowl as a testimony of gratitude for her great zeal, and we may add our hearty congratulations upon her very sturdy and vigorous offspring. Mrs Dent has been fortunate to enlist so many willing helpers. Among these are Miss Gertrude Bacon, Lady Davy, Miss Cardew, Mrs Godden, Miss Cobbe, Miss Peck, Mrs Pinckney, Miss Bingham Stevens (Brownie), Miss Honor Penycoste, Miss Lucy Richards, Mrs Sandwith, Mrs Williams, Mr T. H. Green, and Canon Claye. In one year Mr T. H. Green recorded 1026 species out of the 1323 specified. The Commemoration Number contains a paper by Lady Davy on the Holy Thorn at Glastonbury. The Somerset ballad is quoted:—

> "The Staff het budded and het grew
> And at Christmas bloom'd the wholdaroo (wonder),
> And still het blooms at Christmas bright,
> But best tha sey at dark midnight."

Mrs Dent tells of the inception of the Magazine. We offer our best wishes for the continued success of the Magazine and its readers.

DOMIN, Prof. KARL. BEITRAGE ZUR FLORA UND PFLANZEN-

GEOGRAPHIE AUSTRALIENS IN BIBLIOTHECA BOTANICA. Stuttgart, 1921. We are glad to see the issue of our honorary member's important contribution to Australian Botany, of which he showed some portions to us last year at Prag, and we warmly congratulate him on his recovery from a serious operation he has had recently to undergo.

DOWNING, ANDREW J. LANDSCAPE GARDENING. Tenth edition, pp. xv., 439. Chapman & Hall, London; 36/-.

DRUCE, G. CLARIDGE. The Nomenclature of British Ferns, in The British Fern Gazette, pp. 182-190, 1921. Shetland Plants, in Trans. Linn. Soc. 14, 77, 1921. *Matricaria suaveolens* in Britain, in Gard. Chron. Botanical Foreword, in Wild Flower Magazine 2, 145, 1921.

EDINBURGH ROYAL BOTANIC GARDEN, NOTES OF. In vol. xii., n. 60, an interesting account is given of the garden, which was founded in 1680, and now covers 58 acres. Over half-a-million of people visited it last year, and during the past 32 years nearly 20 million visitors have passed through the entrance gate: a fact that may well please Sir I. Bayley Balfour, who may be assured that each of its visitors received pleasure.

ELFORD, P., and HEATON, S. PRACTICAL SCHOOL GARDENING. Second edition, pp. 224. Clarendon Press, Oxford; 3/6.

EVANS, Dr I. B. POLE. THE FLOWERING PLANTS OF SOUTH AFRICA. Vol. i., pp. 11, tt. x.; Pt. ii., tt. 11-20. L. Reeve & Co., London; coloured 15/-, plain 10/-.

FAIRCHILD, DAVID. Inventory of Seeds and Plants Imported by the Office of Foreign Seed and Plant Introduction, July 1 to September 30, 1916. U.S.A. Department of Agriculture, Washington. 1921.

FARRER, REGINALD. Second Exploration in Asia. In the *Gard. Chron.* for 1921 there is an especially interesting series of papers from the pen of our late talented botanical traveller describing in his usual facile and felicitous manner the glories of the Rhododendrons and other alpine plants he met with on his arduous journey.

FRITCH, Prof. F. E., and SALISBURY, Dr E. J. BOTANY FOR STUDENTS OF MEDICINE AND PHARMACY. pp. xiv., 357. G. Bell & Sons, London; 10/6.

FRITCH, Prof. F. E., and SALISBURY, Dr E. J. AN INTRODUCTION TO THE STUDY AND REPRODUCTION OF PLANTS. pp. viii., 458. G. Bell & Sons, London; 15/-.

FURNEAUX, W. S. COUNTRYSIDE RAMBLES. pp. lvi., 186. New Era Library. G. Philip & Son, Ltd., London.

FYSON, Prof. P. F. THE FLORA OF THE NILGIRI AND PULNEY HILL-TOPS. Vol. iii., pp. xvii., 581. Government Press, Madras.

GAMBLE, J. S., F.R.S. FLORA OF THE PRESIDENCY OF MADRAS. Pt. 4, Rubiaceae to Ebenaceae; pp. 579-768. Adlard & Son, West Newman, London, 1921; 10/-. We may take this opportunity of congratulating Mr Gamble on this most useful work and to thank him for identifying the old Indian material in the herbaria of Dubois and Sherard.

GATES, R. R. Study of Pollen Development in *Lactuca*, in Annals of Botany, vol. xxxv., 365, 1921.

GODFERY, Col. M. J. *Epipactis Muelleri*: A new European *Epipactis*, in Journ. Bot. 101, 1921. A new European *Serapias—gregaria* Godfery, *l.c.*, 241, 1921, from Hyères, and also *S. Lingua*, var. *anomala*.

GODFERY, Col. M. J. Two New Orchid Hybrids—*Serapias Lingua* × *Anacamptis pyramidalis* and *Ophrys arachnitiformis* × *scolopax*, in Journ. Bot. 57-60, 1921.

GUNTHER, R. T. Goodyer MSS. in Magdalen Coll. Library, in Trans. Linn. Soc. 16, 1921. The occurrence of the Library of Goodyer and of the How's MSS. is mentioned in the preface, p. cvii., of the *Flora of Berkshire* of 1897, and the Goodyer Library and MSS. in the *Rep. B.E.C.* 523, 1916.

HAINES, H. G., C.I.G. BOTANY OF BIHAR AND ORISSA. Pt. ii., pp. 224. Adlard & Son, West Newman, London, 1921; 10 rupees.

HARRISON, J. W. HESLOP. The Genus *Rosa*: its Hybridology and other Genetical Problems, in Trans. Bot. Soc. Northumb., Durham, and Newcastle-on-Tyne v., 244-298, 1921. See p. 279. *Primula farinosa*: its Variation in Co. Durham, in The Vasculum, February 1921, with a new var. *littoralis*. See p. 296.

HARRISON, J. W. HESLOP, and BLACKBURN, K. B. The Status of British Rose Forms as determined by their Cytological Behaviour, in Ann. Bot. 159, 1921.

HEDEREN, B. *Primula veris* in Nordvasta Dalarne, in Svensk Bot. Tidskrift, band 15, p. 269, 1921.

HILL, Capt. A. W. A Visit to the Cameroons and Nigeria, in Kew Bulletin 6, 1921. This was an official visit by the Assistant Director of Kew to report upon the Botanical Gardens in that area and upon their restoration and future maintenance. Capt. Hill also made some collections, among which was a new species of *Ochna* which Mr Hutchinson names *O. Hilliii*.

HILL, ARTHUR W., and BEAN, W. J. MEMOIR OF HENRY NICHOLSON ELLACOMBE (1822-1916). The Country Life Library; 10/6. An interesting appreciation of a remarkable horticulturist and a most pleasing man, whose love for plants was proverbial and whose knowledge of them and their culture almost phenomenal.

HORWOOD, A. R. A NEW BRITISH FLORA: British Wild Flowers in their Natural Haunts. Vol. v., pp. xi., 234; vol. vi., pp. xix., 232. Gresham Publishing Co., London; 1919; 12/6 each vol.

HUGHES, D. K. A Revision of the Australian Species of *Stipa*, in Kew Bulletin 1, 30, 1921. Forty species are mentioned, including several new ones. A Key to the Groups and Species is appended.

HURST, C. P. East Wiltshire Plant Galls, in Wiltshire Arch. and Nat. Hist. Soc. xii., 354. Among them is a new British record of a gall on *Salix triandra* caused by a saw-fly—*Pontamia proxima* Lepel, and another on *Gentiana Amarella* caused by *Eriophrys Kerneri* Nalepa.

HUTCHINSON, J. THE GENERA OF FUMARIACEAE AND THEIR DIS-

TRIBUTION. The author holds that Fumariaceae is a distinct family and accepts 18 genera. He uses the names *Dicentra* and *Corydalis*, which are not the earliest.

HUTCHINSON, J. The Family Winteraceae, in Kew Bulletin, n. 5, 1921. The Literature, Distribution, Economic Products, Description, and Anatomical Features are given, as well as a Key to the Seven Genera which it contains.

HUTCHINSON, J., and PEARCE, K. Revision of the Genus *Tryphostemma*, in Kew Bulletin 7, 257, 1921. Twenty-five species are described or enumerated.

JOHNSTON, Colonel H. H. Notes on the Flora of the Orkney Isles, etc., in Trans. Bot. Soc. Edinburgh, vol. xxvii., pt. 1, 43.

JOHANSSON, K. Bidrag till Kannedomen om Gottlands Ulmusformer, in Svensk Bot. Tidskrift, band 15, hafte 1, p. 1, 1921. *U. glabra*, forma *grandidentata*, is figured.

LANGE, AXEL. Lists of Plants from Tun and Hjelm, in Botanisk Tidsskrift Copenhagen, binds 37, hefte 1, p. 1, 1920.

LAUFER, BERTHOLD. SINO-IRANICA: Chinese Contributions to the History of Civilisation in Ancient Iran, with special reference to the History of Cultivated Plants and Products. Field Museum of Nat. Hist. Publications, Anthropological Series. Vol. xv., pp. ix., 445, 1919.

LAUDEGARDH, H. Ecological Studies in the Assimilation of Certain Forest Plants and Shore Plants, in Svensk Bot. Tidskrift, band 15, hafte 1, p. 46, 1921.

LESTER-GARLAND, L. V. Some Plants from Jebel Marra, Darfur, in Journ. Bot. 46, 1921.

LINDQUIST, HY. Om Vegetationen des pa det europertka Ryssland stepper., in Svensk Bot. Tidskrift, band 15, hafte 1, p. 20, 1921.

LJUNGQVIST, J. E. Ein neuer Fundort. für *Nitella batrachospermum*, in Svensk Bot. Tidskrift, band 15, p. 270, 1921.

LOUDON, J. C., and the Garden Magazine, with an account of the issue of the Arboretum et Fruticetum. See *Gard. Chron.* 216, 1921.

LYNN, M. J., M.Sc. The Reversal of Geotropic Response in the Stem, in New Phyt. 116, 1921.

MACOUM, J. M., and HOLM, T. REPORT OF THE CANADIAN ARCTIC EXPEDITION, 1913-18. pp. 25, tt. 13. F. A. Acland, Ottawa.

MAIDEN, J. H. FOREST FLORA OF NEW SOUTH WALES. Vol. vii. W. A. Gullick, Sydney.

MAGNUSSON, A. H. *Pulsatilla vernalis* L., bei Gothenberg, in Svensk Bot. Tidskrift, band 15, p. 271, 1921.

MARTIN, Prof. J. H. BOTANY WITH AGRICULTURAL APPLICATIONS. Second edition, pp. xii., 604. J. Wiley & Sons, New York; 21/-.

MILLER, CHRISTY, F.L.S. An account in Wistman's Wood of small aged specimens (500 years) of *Quercus pedunculata* at 1500 feet alt. on the steep left bank of the West Dart, almost in the centre of Dartmoor. Proc. Linn. Soc. 9, 1921.

MONCKTON, H. W. On the Distribution of *Taraxacum erythrospermum* Andr. in the South-east of England, in Trans. Linn. Soc. 19, 1921. On the chalk in Surrey a red-fruited form is *T. lacistophyllum*.

OLSEN, CARSTEN. The Ecology of *Urtica dioica*, in Journ. of Ecology, vol. ix., no. 1, p. 1, 1921.

OMANG, S. O. F. *Hieracium*: Forms of the Group *alpina*, in Nyt. Mag. Nat. 69-106, 1919.

ORCHID REVIEW. Under the able editorship of Mr Gurney Wilson, F.L.S., we are glad to see this useful publication continued in an enlarged form. It is now issued at 1/- per month.

OSTENFELD, C. H. CONTRIBUTIONS TO WEST AUSTRALIAN BOTANY. Pt. iii., Additions and Notes to the Flora of Extra-Tropical West Australia; pp. 144. Host & Son, Kobenhavn.

OSTENFELD, C. H. *Hieracium rigidum* and mutants. See p. 293.

PARKER, R. N. North-West Himalayan Astragali of the sub-genus *Aegacantha*, in Kew Bulletin 7, 278, 1921.

PEARSALL, W. H., père et fils. Potamogetons in the English Lakes, in Journ. Bot. 100, 1921. This contains a new sub-sp. *lacustris* = *P. Sturrockii* Ar. Benn. (*Rep. B.E.C.* 841, 1919, but not of the *Scot. Nat.* 28, 1883).

PENNELL, FRANCIS W. *Veronica* in North and South America. Contr. New York Bot. Garden, n. 230, 1921, with key to the genera and sub-genera. Our *hederifolia* is put as the type of the sub-genus *Veronicella* Fabr. Enum., 1765. With it are *V. spicata*, *V. fruticans*, *V. alpina*, *V. serpyllifolia*, and var. *humifusa*, *V. peregrina*, *V. arvensis*, *V. agrestis*, *V. polita*, *V. persica*. True *Veronica* contains *Chamaedrys*, *officinalis*, *Beccabunga*, *Anagallis-aquatica*, and *scutellata*. The sub-genus *Hebe* has no British representative.

PERCIVAL, Prof. JOHN. THE WHEAT PLANT: A Monograph. pp. 455 and figs. Duckworth & Co., London, 1921; 63/-. In this portly volume of 463 pages Professor Percival has compressed the results of his painstaking researches of twenty years. The subject is one of vital importance to the human race, since wheat is grown to a larger extent than any other food produce, and with the exception of Siam in every European and Asiatic country. Indeed, the only parts of the world from which it is absent are hot, low-lying regions of the Tropics! It can be grown far north, well into the Arctic Circle, up to 65 degs. N. on the Mackenzie River and southwards to the Equator, where in Ecuador and Columbia it is found at an elevation of 10,000 feet. In Tibet, Humboldt mentions its presence at as high an elevation as 15,000 feet. The Chinese well regarded it as a gift from heaven, and its lineage is of the lengthiest—well formed grains being found in Neolithic deposits. Wheat originated from two or three wild species, " but through hybridisation, mutation, and the effects of selection and cultivation the races of wheat have become as complex as the human race." Professor Percival has performed well the gigantic task of describing the main forms, of which

for some years he has had nearly 2000 in cultivation under his observation at the University College Farm at Reading. Many of these, from excellent original drawings, are illustrated in the 228 plates. It may be well to say that Linnaeus in 1753 described five species of Wheat—*Triticum aestivum*, *hybernum*, *turgidum*, *Spelta*, and *monococcum*, to which in 1763 he added *T. polonicum*, a name propounded by Plukenet, and described in Morison *Hist. Ox.* iii., 175, 1699. Percival thinks it a mutation of *T. durum*. The younger Linnaeus, in 1781, introduced *T. compositum*, a form of *T. turgidum*. In 1821 Roemer and Schultes recognised 21 species. Hackel (Engler & Prantl *Nat. Pfl.* 1887) reduced the cultivated wheats to three species, *monococcum*, *sativum*, and *polonicum*. Professor Percival says two wild species are known, and the cultivated wheats, none of which are found wild, fall into eleven natural groups. These he calls " races " rather than species. Under *T. aegilopoides* Bal., Wild Small Spelt, is put the race *T. monococcum* L. Under species *T. dicoccoides* Körn are placed the races *T. dicoccum* Schübl (Emmer), one of the oldest of cereals, being found in Neolithic remains, and well carved models of it were found in the tomb of King Zer Ta, 5400 B.C., in Egypt; *T. orientale* Percival (Khorasan Wheat); *T. durum* Desf. (Macaroni Wheat); *T. polonicum* L. (Polish Wheat), first mentioned by Bauhin, 1651, next by Bobart, 1690, who says he had it out of Worcestershire; *T. turgidum* L. (Rivet or Cone Wheat), mentioned in Tusser's Husbandry in 1580, but already mentioned by Fuchs in 1542; *T. pyramidale* Percival (Egyptian Cone Wheat); *T. vulgare* Host (Bread Wheat), also of very early culture, and of hybrid origin; *T. compactum* Host (Club Wheat), grown by Neolithic man; *T. sphaerococcum* Percival (Indian Dwarf Wheat); and *T. Spelta* L. (Large Spelt). The name " spelt " (speltae) occurs in an edict of Diocletian, A.D. 301. The Wheat is said to be of Germanic origin, and Percival suggests that it is a segregate of the hybrid of the Emmer series with *Aegilops cylindrica*. This method of classification may trouble the compilers of an index of species since, as in the instance of the *Kew Index*, " races " are not consistently recognised. But as hybrid names are admitted it would seem desirable to recognise them, and they might have the word " race " following the reference. Britain may well be proud of this monumental work, which will be the text book for Agricultural Science for many years

to come. Our profound admiration for the industry and ability displayed in its production cannot be properly expressed in the limited space at our disposal.

PETERSEN, H. E. Studies on *Pimpinella Saxifraga* L., in Botan. Tidsskrift, binds 37, hefte 3, pp. 222, 1921.

PIETERS, J., and KEPHART, I. W. Annual White Sweet Clover (*Melilotus alba*) and Strains of the Biennial Form. U.S. Department of Agriculture, Circular No. 169, Washington, 1921.

POPENHOE, WILSON. MANUAL OF TROPICAL AND SUB-TROPICAL FRUITS. Macmillan & Co., New York; 30/-.

POULTON, ETHEL M. An Unusual Plant of *Cheiranthus Cheiri*, in New Phytologist 242, 1921. But it is not rare.

PRAEGER, R. LLOYD. An Account of the Genus *Sedum* as found in Cultivation, in Journ. Royal Hort. Soc., vol. xlvi.

PRAEGER, R. L. ASPECTS OF PLANT LIFE, WITH SPECIAL REFERENCE TO THE BRITISH FLORA. pp. 208. Nature Lovers' Series. S.P.C.K., London; 6/-.

PRAIN, SIR DAVID. INDEX KEWENSIS: an Enumeration of the Genera and Species of Flowering Plants from the time of Linnaeus to the year 1885. Compiled at the expense of the late Charles Robert Darwin, under the direction of Sir Joseph Hooker, by B. D. Jackson. Two volumes, royal 4to, pp. 2568, morocco back, with one uniform volume of five supplements, bringing the work down to the end of 1915, £25 4s. The volume of supplements separately, £12 12s. The two volumes of the original work with five separate supplements, in cloth, £21. Supplement I. (1886-95), by T. Durand and B. D. Jackson; pp. 526; not sold separately. Supplement II. (1896-1900), compiled at Kew under the direction of Sir W. Thiselton Dyer; pp. 204, 36s net, or in two parts, paper covers, 15s net each. Supplement III. (1901-5), compiled at Kew under the direction of Sir David Prain; pp. 198, 36s net. Supplement IV. (1906-10), compiled at Kew under the direction of Sir David Prain; pp. 256, 36s net. Supplement V. (1911-15), compiled at Kew under

the direction of Sir David Prain, pp. 277; Oxford, at the Clarendon Press, June 1921; 76s net. The gratitude of the botanical world is due to the Director and his staff at Kew for the great assistance they have given not only to the scientific side of botany but to the application of the economic side, which has proved of inestimable service to ourselves and to our vast overseas Dominions. In a hundred-and-one ways they are called upon for information, and it is always courteously and readily given, and at no time in its prolonged history, under such great botanists and botanical organisers as Sir John Hill, Sir W. Jackson Hooker, Sir Joseph Hooker, Thiselton Dyer, and Sir W. T. Dyer has this help been more generously bestowed than under Sir David Prain, who has so recently resigned. In the directorship of Sir Joseph Hooker another task was added to Kew. That was the preparation of an Index of Plant Names, which by the far-sighted munificence of Charles Darwin was entrusted to the Director to carry out. Hooker had not far to seek for assistance, for in Dr Daydon Jackson there was a born indexer close at hand. The task was a gigantic one. It was to collate all the generic and specific names given to plants by botanists throughout the world since the year 1753. It must be borne in mind that at its conception the laws which were supposed to govern botanic nomenclature were those promulgated at Paris under the auspices of M. A. de Candolle, in which the starting point of generic citation was the *Genera Plantarum* of Linnaeus of 1737, whereas that of species began with the *Species Plantarum* of 1753, the limitation of genera being based on Bentham and Hooker's *Genera Plantarum*. The one palpable omission in the scheme of citation was the absence of the date of publication in the majority of cases. The preparation of the *Index* not only meant an immense amount of drudgery—there must be 300,000 specific names given—but it also necessitated a great organiser. The publication of the four fasciculi (I. and II. in 1893, III. in 1894, IV. in 1895), paged in two volumes, met with warm encomiums, and its advantages were at once realised by botanists throughout the world. The *Genera Plantarum* being taken as the authority, two grades of type were used—the "official" names for genera in Egyptian as against Roman capitals for the "unofficial" or invalid names, and for species small Roman type for the "official" and italics for the synonyms—and consistent cross-references were given. Thus,

Reseda vulgaris Mill was correctly referred to the earlier *R. lutea* L., and *Sinapis nigra* L. to the name under the genus *Brassica*, into which Bentham and Hooker merged *Sinapis*, i.e., *Brassica nigra* Boiss. The names are spelled as nearly like the original as possible, that is, the plants of the genus which was established as *Eleocharis* by Robert Brown are put under that name, notwithstanding some purists say it should be as Lindley wrote it, *Heleocharis*, but under the latter the cross-reference is usefully given. So, too, *Brunella* Tourn., which is the more correct name and one which Linnaeus should have used, is referred to *Prunella* L., which is the earliest published *valid* name, even if etymologically incorrect. So, too, *Rynchospora* Vahl of 1806 is adopted because it is the earliest, notwithstanding it should have been written *Rhynchospora* as written by Willdenow in 1809. The two names in the *Index* are separated by 50 pages. It was not unusual at the period when the *Index* was compiled to ignore the works of Sir John Hill, so that, except in a few instances and these not consistently, his names are ignored, and although some editions of Miller's *Dictionary* are cited, others are overlooked, and this even after the starting point of generic and specific citation—1753. On the other hand, some works (notably Adanson's *Familles des Plantes*, which is put on the Index Expurgatorius in the *Cambridge Flora*) are very freely cited, although Adanson did not accept the Linnean system. So, too, is Patrick Browne's *Civil and Nat. Hist. of Jamaica* and Haller's *Historia*, and rightly too, although both are barred in the *Cambridge Flora*. One criticism was not unjustly urged—that the publication of the *Index* gave an opportunity to correct many generic names in the *Genera Plantarum* of Bentham & Hooker, who paid quite secondary attention to matters of nomenclature, and thus were in divergence from continental usage. The publication of the *Index* led to one notable result. A very methodical German who had studied botanical literature in a most searching manner, and who was also a good but not a great systematist—Dr Otto Kuntze—saw that having one date for the citation of genera and another for species brought into the area of citation a considerable number of works published between 1737 and 1753 which according to the laws were not prohibited from adoption. But he went further. He suggested that the starting point for generic citation should be Linnaeus' first systematic work, the rare *Systema Plantarum* of

1735. Taking this date as a standard, he collated the various generic names which had priority over those adopted in the *Index Kewensis*, and in his *Revisio Generum Plantarum* he published the names of very many genera, and under these the species, which if adopted would have made 10,000 (more or less) changes in plant names. Among what most botanists thought was a mound of chaff there was, however, some grain, but Kuntze had been rather arrogant in his statements, had not endeared himself to those with whom he came into controversy, and his suggestions were treated with contumely. About that time, and in the absence of such a work as the *Index Kewensis*, I had with great labour compiled for the *Berkshire Flora* the earliest names I could discover, but to go behind the *Species Plantarum* had never crossed my mind. To avoid this great upheaval in plant names, it seemed the most logical course to make the starting point for generic and specific citation one and the same, i.e., 1753. I therefore wrote at length to M. A. de Candolle urging the desirability of framing a law to that effect. He told me he did not see his way, but when I went more fully into detail, showing its advantages, and when he was independently approached by Prof. Ascherson of Berlin, he gave way, and at the International Botanical Congress in Vienna in 1905, Article 19 says : — "Botanical nomenclature begins with the *Species Plantarum*, ed. i., 1753, for all groups of vascular plants. It is agreed to associate genera, the names of which appear in this work, with the descriptions given of them in the *Genera Plantarum*, ed. v., 1754. In order to avoid undue changes in generic names by the strict application of the rules of nomenclature, and especially of the principle of priority in starting from 1753, the rules provide a set of names which must be retained in all cases." This list was hurriedly prepared, and contains examples of great unfairness. A very important section of American botanists disagreed with the List of Nomina Conservanda as being "in the highest degree arbitrary" and as "controverting a cardinal principle," and they have ignored it. But to return to the *Index*. The first Supplement, including names published 1886-1895, was prepared by Dr Jackson and Theophilus Durand (the author of Durand's *Index to the Genera of Bentham and Hooker*, and joint author with Hans Schinz of the *Conspectus Florœ Africœ*. It was printed at Brussels, and issued in 1906. Unfortunately, under the stress of compilation, Durand

nearly lost his eyesight, so that the work is not so free from errors as the original volumes, which had the advantage of the meticulous care which the Clarendon Press gives to its publications. This Supplement had 466 pages, besides over 50 pages of additions and corrections. It thus dealt with over 50,000 names. The same plan of typography is retained, and *Rynchospora*, *Prunella*, and *Eleocharis* are kept as the official names. Most of Kuntze's names are given in synonymy. Hybrids are distinguished by × after the name. In the addenda a hybrid *Brunella* is given without a cross-reference. (This name has another disadvantage: there is already an official *Brunellia*.) The Supplement is printed on an inferior and loaded paper. In 1908 the second Supplement, beautifully printed at the Clarendon Press, was issued, and included the plants published 1896-1900. This consists of 204 pages, and includes nearly 25,000 names. In this the useful reference to the page in the *Index Kewensis* is omitted from the generic name. The three genera already cited as examples are still kept under their original name. Few hybrids are given. The third Supplement, also printed at the Clarendon Press in 1908, deals with years 1901-1905, and was produced under the aegis of Sir D. Prain. In this we find *Rynchospora* and *Rhyncospora* (for instance) are both retained and without cross-reference, as are *Brunella* and *Prunella*. This troublesome factor has to be borne in mind when consulting Supplements III.-V. of the work, or one may miss the reference. Again, very many of the Benthamian genera are split into two or more of Engler's genera. *Ampelopsis*, which was in the *Index* merged in *Vitis*, is now kept in heavy type in accordance with Planchon's monograph. It had been found that the number of addenda to be consulted—one in the original *Index*, two in Supplement I., and one in Supplement II.—led to names sometimes being overlooked. Separate addenda were accordingly discontinued from the third Supplement onwards, any additions being incorporated with the general body of names in one alphabetical arrangement. Hybrids have the word "hybr." after the name. The fourth Supplement appeared in 1913, and gives the names published in the years 1906-1910. A modification is introduced in keeping all the names in one type, i.e., no differentiation between official and unofficial. Owing to the lapse of time since the publication of Bentham and Hooker's *Genera Plantarum*, the generic limits recognised in that

work were in numerous cases no longer accepted by a large proportion of systematists. Engler and Prantl's *Die Natürlichen Pflanzenfamilien* could not be taken as a substitute, since the want of uniformity in the treatment of different families precluded its adoption as a standard for genera. As an example, Prantl's "lumping" in *Ranunculaceae* may be compared with Raimann's "splitting" in *Onagraceae*. In the circumstances it was decided that the *Index*—from the fourth Supplement onwards—should no longer be a nomenclator, but should become an Index in the strict sense of the word. Reductions were discontinued, a colon being used to separate two synonymous names, as the employment of the = sign might have led to misconception. Thenceforward the onus of determining the validity or otherwise of a particular name was transferred to the individual systematist. From the fourth Supplement onwards the dates of publication of names have been given in all cases. This has materially increased the utility of the work. Now to come to the volume which is just issued in 1921 under the aegis of Sir David Prain. This, too, is excellently printed by the Clarendon Press, is singularly free from misprints, and is a volume which, treating as it does of the years 1911-1915, had to be prepared during the period of the Great War, with a depleted staff, and amid a thousand interruptions. It includes between 25,000 and 30,000 names. In this, as in the last Supplement, only one kind of type is used for the specific names, and the departure from the plan originally adopted of keeping to the Benthamian and Hookerian standard of genera is still maintained. With the object of rendering the work still more useful, the geographical distribution of the new species was given in greater detail. Many names omitted from previous Supplements were taken up, notably in the genera *Rubus* and *Hieracium*.

RAYNER, J. F., F.R.H.S. The Flora of Millbrook Station (S. Hants). Our member found in an area of about $3\frac{1}{2}$ acres 280 species, several of which are additional adventives to the Flora of South Hampshire. Most of the critical plants passed under my observation. The useful list is published in the *Proceedings of the Hampshire Field Club*, vol. ix., pt. 1, pp. 99, 1920.

REA, MARGARET W., B.Sc. Stomata and Hydathodes in *Cam-*

panula rotundifolia and their Relation to Environment, in New Phyt. 56, 1921.

REID, C., and GROVES, J. The Charophta of the Headon Beds of Hordle Cliffs, in Quart. Journ. Geol. Soc., vol. 88, 175-92, 1921.

RIDLEY, H. N. Indo-Malayan Species of Jussiaea, in Journ. Bot. 257, 1921.

ROCK, Prof. JOSEPH. THE LEGUMINOUS PLANTS OF HAWAII. tt. 92. Honolulu, 1920.

RUSSELL, EDWARD J., D.Sc., F.R.S. SOIL CONDITIONS AND PLANT GROWTH. pp. viii., 406. Fourth edition. Longmans, Green & Co., London, 1921. The first chapter traces the gradual development of the science in history. In the second, which is mainly physical, a very clear account of the soil conditions affecting plant growth is given. "The Biological Condition in the Soil" occupies chapter vi. A long chapter (vii.) is devoted to the micro-organism population, but perhaps the most interesting chapter to botanists is the eighth, which considers "The Soil in Relation to Plant Growth," and contains a concise account of Ecology. Different ecological conditions are discussed and the history and successive changes in the Flora of certain types of soil are traced, while the progressive development of Agriculture is referred to. The last chapter (ix.) deals with methods of soil analysis. A "selected bibliography" of 323 titles of works which are referred to in the text is included. The author explains in the preface that the book is intended as a general monograph, embracing all the branches of the science, including Biology, to be taken in conjunction with a series of special monographs each written by the heads of the various departments of his Experiment Station at Rothamsted, which together will be known as the "Rothamsted Monographs of Agricultural Science." The photographic illustrations are not numerous but are excellently produced. Altogether it is a masterly treatise which cannot fail to awake the interest of botanists, and will be of special value in promoting a closer touch between Biologists, Chemists, and Physicists, which is so very necessary in attacking the complex problems of the soil.
C. V. MARQUAND.

The great part of this exhaustive Monograph is highly technical and, of course, outside the limit of the taxonomist, but no scientific agriculturist can afford to neglect it, and even the field-botanist will meet in its pages with many interesting factors of plant or weed occurrence. For instance, in treating of loam soils, it is correctly stated that *Clematis Vitalba* will wander from the chalk on to loam when these soils abut, but the demarcation is much more abrupt when the chalk abuts on a sand or clay, to which the *Clematis* scarcely extends. In Bucks, where clay has limestone nodules in it, the *Clematis* and *Cirsium eriophorum* may sometimes be found on what at first seems to be a wrong surface soil. Field botanists have long recognised that some plants are fond of acid, others of chalk or calcareous soils, but Dr Russell does well to draw attention to the fact that these partialities are not quite so simple as at first they seem. "A plant may be eliminated from the natural flora not because it cannot tolerate the degree of sourness in the soil but because it tolerates this sourness less well than its competitors. Another plant may flourish in sour soil, not because conditions of sourness are suitable to it, but because of the absence of effective competition. Thus, sorrel is often described as an indicator of sourness, but this is not entirely correct: it is not the presence of sorrel that is symptomatic, for sorrel will grow quite well on chalk soils; it is rather the presence of sorrel, sweet vernal grass, etc., combined with absence of clover. The effect of sourness, like that of any other adverse factor, is to alter the balance in competition somewhat against a particular set of plants, which tend, therefore, to be eliminated in time." In Ireland, on the carboniferous area of the Burren, *Calluna* grows (it is true, in a poor state) almost directly upon the calcareous soil, a curious ecological problem. Dr Russell observes that plants growing on clay soils tend to have larger leaves and to make shorter-jointed growth than plants on sandy soils. The book is a work of which Rothamsted may well be proud.

SALISBURY, E. J., and TANSLEY, A. G. The Durmast Oak-woods, etc., in Journ of Ecology, vol. ix., no. 1, p. 19, 1921.

SAMUELSSON, G. Om några *Lepidium-arter*, in Svensk Bot. Tidskrift, band 15, hafte 1, p. 29, 1921.

SCHINZ & THELLUNG. Beitrage zur Kenntnis der Afrikanischen Flora: Amarantaceae-Compositae, in Naturf. Ges. Zurich 66, 221, 1921. Beitr. zur Kenntnis der Schweizerflora (xviii.): Nomenclature (vii.), *l.c.*, 257-317, 1921.

SKENE, MACGREGOR, D.Sc. COMMON PLANTS. 8vo, pp. 271, tt. 24. A. Melrose; 6/-. It is with much pleasure that we call the attention of our readers to this very excellent little book, in which the author has produced the most happy combination between the scientific manual and the popular treatise. Indeed, it is not too much to say that it should be in the hands of every field botanist; even the most experienced will find something in it to interest and instruct him. The book is also well illustrated with some excellent drawings and photographs. The first two chapters and the last deal with the origin and cultivation of races of cereals, particularly of wheat, of which what is probably the original parent plant, *Triticum Hermonis*, has lately been discovered in Palestine. Chapter IV., taking the maple as an illustration, treats of the process of photosynthesis, and the assimilation of the chemical elements necessary to the growth of plants. Then follows an account of the life history and development of various degrees of parasitic plants, the mistletoe, dodders, and broom-rapes, the carnivorous and climbing plants, and of the leguminous plants which are able to extract and retain nitrogen from the air. The various kinds of cryptogamic flora, mildews, rusts, toadstools, lichens, and ferns are all dealt with at length. The chapters on fertilisation are of special interest. Though we cannot in this country exhibit the wonders of the yucca and the fig, the observant field worker will find much to interest him in studying the ways of broom, whin, sage, and many other plants. But perhaps the most interesting chapter in the book is that dealing with graft-hybrids, where it relates how a composite plant from seeds produced from flowers arising from a piece of garden nightshade grafted on to the stock of a tomato, which produced buds at the point of junction of the two plants. The account of the species of ants that grow their own mushrooms should also be noted. T. GAMBIER-PARRY.

SMALL, Professor JAMES. Some Chapters in Modern Botany, in Proc. Belfast Nat. Hist. and Phil. Soc. 85, 1920-1. (1) The Wanderings of the Groundsel. A most interesting lecture, which we

hope sometime to reprint in our Report. (2) The Erectness of Plants.

SMALL, Prof. J. TEXT-BOOK FOR MEDICAL AND PHARMACEUTICAL STUDENTS. pp. 681, fig. 1350. J. A. Churchill, London, 1921; 25/-. To one like myself, brought up on Bentley's Botany, the change to that of Reynolds Green was considerable, but this text-book of Prof. Small's, which is meant to supersede the latter work, is indeed a lengthy journey. There is no doubt of the excellence of this manual, which is intended as a text-book primarily for the medical and pharmaceutical student. For this latter class of student, studying for the qualifying examination, the important part covered in the curriculum is printed in larger type, a smaller type being employed for the more extended syllabus of the major examination and for the groups of lower plants which are usually included in a medical course. Many medicinal and economic plants are used as examples. One of the features of the work is that there is no division of the study of plants into morphology, anatomy, and physiology, and the stages (quoting from the Introduction) have been taken from the seed to the fruit in the order in which they occur in nature. Physiological processes and anatomical or morphological features are discussed at the points where they become dominant in the life of the plant, while certain special aspects, such as movement, evolution, and ecology, are considered towards the end of Part I. In Part II. the Principles of Classification are tersely but clearly described. The Appendix No. I. gives the Diagnostic Characters of certain Medicinal or Poisonous Plants, which is of general interest. The book is well printed, and the very numerous figures are clear and well selected. A good-natured gibe at the insufficiency of a botanical dictionary is given in quoting its definition of a seed as "a ripened ovule," and an ovule is said to be "an immature seed." Dr Small, however, makes it quite clear and attractive by defining a seed as a "ripened integumented megasporangium," which recalls the appellation (a parallelopipedon) given by Sydney Smith to the fish-wife, for even laboratory botanists do not like to call a spade a spade, and rarely use one syllable if it is possible to employ four. To the special class of student it is specially written for, and to even a wider range of enquirers, the text-book can be cordially

recommended, and its author, who has shown he is not only a good laboratory botanist, but also a philosophical botanist, is to be warmly congratulated upon producing such an excellent piece of work, which is destined to have a wide circulation.

SMALL, Prof. JAMES. The Hydrion Differentiation Theory of Geotropism, in New Phyt. 73, 1921.

SPRAGUE, T. A. A Revision of the Genus *Belotia*, in Kew Bulletin, n. 7, 270, 1921. A Revision of the Genus *Capraria*, *l.c.*, n. 5. The Generic Name *Schizonotus*, in *Journ. Bot.* 249, 1921.

SPRAGUE, T. A., and RILEY, L. A. M. Notes on *Raimannia* and Allied Genera, in Kew Bulletin, n. 5, 198, 1921.

STANDLEY, P. C. FLORA OF GLACIER, NATIONAL PARK, MONTANA. Vol. 22, pt. 5. Smithsonian Institute. Government Printing Works, Washington.

STANSFIELD, F.W., M.D. THE BRITISH FERN GAZETTE. Vol. 4. 1921. We are very glad to see this useful periodical again in evidence under the able editorship of the well-known fern expert.

STAPF, O. Kikuyu Grass, *Pennisetum clandestinum*, in Kew Bulletin, n. 2, p. 85.

STEPHENSON, Rev. T., D.D., and T. A., M.Sc. NATURAL HYBRID ORCHIDS FROM ARRAN. Photographs and description of *Gymnadenia Conopsea* and *Orchis ericetorum*. The suggested parentage seems quite reasonable. In the *Rep. B.E.C.* 199, 1906, I recorded this hybrid from Langton Lees, Berwickshire, and then named it × *O. Evansii*, after my companion, who has not only done so much good work at Ornithology, but also in Botany, the second volume of Fryer's Pondweeds being edited by him. According to British nomenclature, the combination is *Orchis maculata* L. × *Habenaria Gymnadenia*. Messrs Stephenson give a new hybrid from the same Scottish island—*G. conopsea* × *Orchis purpurella*. They also found what they regarded as *O. purpurella* × *latifolia*, *O. purpurella* × *Fuchsii*, and *O. purpurella* × *ericetorum*.

STERNER, R. Om *Geum hispidum* Fr., in Svensk Bot. Tidskrift, band 15, hafte 1, p. 126, 1921.

STONE, HERBERT. A TEXT-BOOK OF WOOD. pp. 240, tt. 41. W. Rider & Sons, London, 1921; 21/-.

STURTEVANT, A. H. NORTH AMERICAN SPECIES OF DROSOPHILA. pp. iv., 150, tt. 3. The Carnegie Institute of Washington Publications, 301, 1921.

TENGWALL, T. A. *Carex rufina* Drej. and *Triglochin maritimum* L. in Torne Lappmask, in Svensk Bot. Tidskrift, band 15, p. 268, 1921.

THATCHER, Dr R. W. THE CHEMISTRY OF PLANT LIFE. pp. xvi., 268. M'Graw-Hill Book Co., New York and London; 18/-.

THELLUNG, A. Pflanzenwanderungen unter dem Einflus des Menschen, in Engler's Bot. Jahrb., band 53, heft 3-5, beib. 116, pp. 37-64, 1915. A fascinating and thorough piece of work of which, one regrets, the exigencies of space prevent a translation being given in full. Dr Thellung refers to the various ways in which the different industries are responsible for plant introduction, referring to wool-washing, ship-ballast, transport by railways, canals. Of 769 adventive species, the wool-industry is responsible for the introduction of 526.

THORRINGTON, F. W. British Fern Varieties, in Proc. South London Entom. & Nat. Hist. Soc., 1919. On p. 13 the writer alludes among others to *Filix-mas*, var. *cristata*, from St Austell, Cornwall.

TROUP, Prof. R. S. THE SYLVICULTURE OF INDIAN TREES. In 3 vols.:—Vol. i., Dilleniaceae to Papilionaceae, pp. lviii., 336; vol. ii., Cesalpinieae to Verbenaceae, pp. xi., 337 to 783; vol. iii., Lauraceae to Coniferae, pp. xii., 783-1195. Clarendon Press, Oxford; £5 5/-.

TURRILL, W. B. A New European Plant, *Gonocytisus angulatus* Spach, found by C. G. Field Marsham on the steep cliffs of Cape Hellas, Gallipoli. It is the *Spartium angulatum* of Sibth. *Flora Graeca*, t. 672.

TUTTLE, GWYNETH M. Reserve Food Materials in Vegetative Tissues, in Bot. Gazette 6, 1921.

UDALE, JAMES. HANDY BOOK OF PRUNING, GRAFTING, AND BUDDING. Simpkin, Marshall, Hamilton, Kent & Co.; 2/6.

WARD, Capt. F. KINGDON. IN FARTHEST BURMA. pp. 311. Seeley, Service & Co., London, 1921; 25/-.

WARD, Capt. F. KINGDON. Botanical Exploration of the North-East Frontier, in the Gard. Chron. for 1921. There are several most delightful papers describing the country covered, and the rare and beautiful plants the intrepid traveller noted.

WEBSTER, A. D. On the British "Brown Oak" Timber, in Gard. Chron. 164, 1921. The best in Britain is said to be that obtained from Rockingham Forest, Ampthill, Beds, and Welbeck, in Notts. This Brown or Red Oak timber is by some authorities thought to be a distinct variety, by others it is thought to be due to the presence of iron in the soil, and by others to the presence of a fungus living in the wood. Mr Webster, however, believes that the presence of iron is the more likely explanation. He says that in America it is much prized. The dining-room at Washington White House is entirely panelled with it. Veneers, as many as thirty or forty to the inch, are used.

WESTBERG, H. *Carex sylvatica* in Dalarne, in Svensk Bot. Tidskrift, band 15, p. 269, 1921.

WILLIAMS, F. N. Critical Notes on Some Species of *Cerastium*, in Journ. Bot. 324, 349, 1921.

WILSON, E. H., and REHDER, ALFRED. A MONOGRAPH OF AZALEAS. Publications of Arnold Arboretum. Cambridge, Mass.; 5 dollars.

OBITUARIES.

BUCKNALL, CEDRIC. Born at Bath in 1849; died suddenly at Clifton, Bristol, on December 12, 1921, aged 72. He made music his profession, and settled eventually at Clifton, where he taught. He was organist at All Saints' Church from 1876 to the end, being held in high esteem by the clergy and congregation for himself, his fluency of improvisation, and his skill in plain-song accompaniment. He took his degree of Bachelor of Music at Keble College, Oxford, in 1877, and held the post of Lecturer on Harmony and Counterpoint at the British University. Science, however, was an attraction to him from the first, and he studied continuously different branches of it. As he rarely talked of his knowledge his friends lost sight of his attainments, and others did not realise his wide abilities. Amongst the branches he worked upon may be reckoned astronomy, clock construction, and microscopy. Natural History was his main love, and in this he was ever interested, and never satisfied till he had tried to clear up the difficulties before him. He early joined the Bristol Naturalists' Society, and he began in 1878 to contribute to its *Proceedings* "A List of Fungi of the Bristol District," a valuable summary of fifteen years' diligent search. He recorded 1431 species, amongst which were 76 new to Britain or to Science, and 2 were named in his honour, *Agaricus Bucknalli* (B. & Br.) and *Hemiarcyria Bucknalli* (Massee). Other papers by him on various subjects will be found in the same publications. He was one of the founders of the University Botanical Club for systematic and field botany, and by his constant attendance and frequent papers was a stimulus to the rising generation of botanists. The Botanical Exchange Club has also lost a valued referee. His acknowledged keenness in the field enabled him to detect *Stachys alpina*, new to Britain, growing amongst *S. sylvatica* at Wotton-under-Edge, Glos., as well as a *Rubus* in the same locality, which was named after him by his friend, J. W. White. Later in life he found he wanted a wider field in which to study flowering plants, and this led him often to spend his limited holidays on the Continent for travel in Norway, the Western Mediterranean, the Balearic Islands, and the Pyrenees. His methodical habits were well exemplified in the way he planned out in

advance each day's work for these botanical journeys, which gave excellent results, besides securing other unexpected rarities. A large Continental herbarium was in this way formed, which it is hoped may be acquired by the Bristol University. He learnt the languages of the countries he visited, and had a workable knowledge of nine, which helped him when he examined foreign herbaria to study critical genera. He rarely published much of his research, but his monograph, "A Revision of the Genus *Symphytum* Tourn." was accepted by the Linnean Society for its *Journal*, 1913, and another on "British Euphrasiae" was issued as a Supplement to the *Journal of Botany*, 1917. Cedric Bucknall was of a retiring disposition, not seeking honours or notoriety for his work, but believing in knowledge for its own sake. He never spared himself in travel or hours of study in earnest effort to get his critical opinions correct with Nature's laws. Willing to help at all times when appealed to, he endeared himself to those who penetrated his quiet thoughtfulness, and he is mourned for as a friend and a good critical botanist. IDA M. ROPER.

CZAPLICKA, Miss. Died on May 20, 1921. In 1914-15 she made an adventurous journey into the Yenisei and Lena Valleys, which are described in *My Siberian Year*. At Oxford she lectured on Ethnology until the end of the war, and then at the University of Bristol acted in the same capacity. She made in Siberia a small collection of plants which are now in the Fielding Herbarium and await precise identification.

DRUMMOND, JAMES RAMSAY, B.A.(Oxon), F.L.S., the son of a Scottish country clergyman, and grandson of the famous botanical collector, Thomas Drummond, was born on May 25, 1851. Educated at the Edinburgh Academy, and at the Universities of Glasgow and Oxford, he entered the Indian Civil Service in 1874. Posted to the Punjab, he served in that province as Assistant Commissioner, District Judge, and Deputy Commissioner until 1904. Inheriting the natural history tastes of his grandfather (also manifested equally strongly in his granduncle, James Drummond), J. R. Drummond, during his long service in the Punjab, found extensive and valuable collections, largely made by himself but supplemented by others made by native collectors in his private service. The last months

of his services in India were spent at Calcutta, his services being lent to the Government of Bengal as Acting Curator of the Herbarium in the Royal Botanic Garden there. It was Drummond's ambition to prepare after retirement a local flora of the Punjab, a proposal to which the Secretary of State for India lent his warm approval. With this object in view he settled after retirement first at Kew and thereafter at Acton. Unfortunately, failing health prevented the realisation of his purpose. He died at Acton on April 11, 1921. D. PRAIN.

DUCIE, THE EARL OF. Born June 26, 1827; died 1921. At Tortworth Court, Gloucestershire, Lord Ducie had an extremely fine collection of trees, in which he took the keenest interest. He had the finest specimen of *Castanopdis californica* in Britain, over 30 feet high, and as it was fertile the seeds of this Golden Chestnut of California were freely distributed to his friends. His collection of Oaks was remarkable. Tortworth is the home of the celebrated *Castanea sativa*, the oldest and largest Sweet Chestnut in Britain. It may be remembered that in our last year's *Report* a short memoir appeared of our late member, Lord Moreton, the only son of Lord Ducie, who was the father of the House of Lords, and a generous patron of the science of arboriculture, of which he was such a splendid exponent. With respect to the Tortworth Chestnut, it is stated that it stood there in 1150, and was then called the Great Chestnut of Tortworth. It fixes the boundary of the Manor. In 1759, at the height of 6 feet from the ground, it had a girth of $46\frac{1}{2}$ feet. See *Gent. Mag.*, 1766.

HARLEY, Dr JOHN. Born 1833; died December 9, 1921. By the death of Dr John Harley, a native of Ludlow, the Linnean Society loses one of its oldest members. He was elected on June 18, 1863, and the volume of the Society's Transactions (XXIV.) of the same year contains a paper by him on the parasitism of the Mistletoe, which he studied in the hope of finding some light on the causes of malignant growths in the human subject. In this Dr Harley gives a detailed description of the anatomy of the parasite, the portion of the host to which it is attached, and demonstrates the very close relation existing between the host and parasite. From an examination of the structure of the wood of the various hosts he concluded

that the size and number of the medullary rays is the chief cause which determines in any given case the attachment of the Mistletoe. Dr Harley's researches into the action of hemlock attracted attention in the medical world. He wrote papers on "The Old Vegetable Narcotics," besides many on medical subjects which appeared in the Medical and Chirurgical Soc. Transactions. Dr Harley was equally well known for his researches in Geology, and he was a man of wide literary and scientific interests. On retiring from his London practice he built a house, Beechings, near Pulborough, Sussex, on the site of an old British camp, which dominates the surrounding country. Here his botanical knowledge gave him pleasure in experimenting in the culture of rare plants, which he enjoyed showing to his scientific friends. He enjoyed remarkable vigour of mind and body to within a few days of his death on December 9th, at the age of 88.

LEES, FREDERICK ARNOLD. Born in 1853; died at Meanwood, Leeds, September 17, 1921. Lees was the son of F. R. Lees, Ph.D., who wrote a prize essay on "Total Abstinence," which had a very large circulation, and was also an extremely eloquent platform orator, who stood as a candidate in the Total Abstinence interest for Northampton about 1870, but was defeated by a large majority. Arnold Lees entered the medical profession, qualifying as a Member of the Royal College of Surgeons in 1871. He began his practice of medicine in the Yorkshire Dales, and there also he carried on his botanical work with zeal. For many years he had the wandering spirit. He took a practice and soon sold it, and probably his desire to see a new area and make new records was a powerful temptation, which he did not seriously resist. His main work was, however, done in Yorkshire, and in conjunction with Mr J. W. Davis, once Mayor of Halifax, he published an important work on *West Yorkshire*: being an account of its Geology, Physical Geography, Climatology, and Botany, a volume of 414 pages, in 1878, which was so much appreciated that a second edition had to be supplied. In August of that year he was at Market Rasen, in Lincolnshire, a county in the botany of which he took a great interest, and in the same year he took over from Mr Bates Blow the Recordership of the Botanical Locality Record Club, a very useful Society which was started in 1873, whose chief work was to ascertain Plant Distribution

in Britain, and to fill up the gaps in the British Watsonian Vice-counties. Lees acted as editor till 1886, and Mr Charles Bailey as its secretary and treasurer, which proved an expensive office. Our own Society has taken up the main scheme of its work in its "New County and other Records." When he was Recorder in 1879 I made Lees' acquaintance, and a botanical correspondence was carried on with him which only ceased with his death. He was a writer of a vigorous style, which in later days became ultra-Carlylean. He was also a good letter writer, always having some problem which he wanted to solve, an identification which he needed, or some theory to expound. One letter picked at random is appended. By the end of 1879 he was at Wetherby, near Leeds, and in 1880 he found and sent me a Sedge which he named (*Science Gossip* 278, 1880) *Carex saxumbra*. He was annoyed to find that it was afterwards (*Journ. Bot.* 97, t. 218, 1881) named *C. pilulifera*, var. *Leesii*. Subsequently it has been identified with the earlier named var. *longibracteata* Lange, and so sinks in synonymy. In May of that year he asks for "specimens of *Oenanthe silaifolia* and *Lachenalii*. Prof. Babington has his doubts about even the Oxford plant being Bieberstein's *silaifolia*, and Nyman does not give Britain for that species at all. He makes out we have *peucedanifolia* Poll. The thing wants working up, and only with fresh specimens and Reichenbach can I do it." By December 1881 he had moved to Warrington, and from that area he made several additions to the West Lancashire flora. From July to October 1883 he was at Reading, Berks, where we made an expedition or two, and from that neighbourhood he sent me a few records which are incorporated in the County Floras. In 1883 he was at Kidderminster, and he says he "hopes to explore the Wyre Forest botany for a year or two," and begs me to obtain for him the recently-discovered *Lycopodium complanatum* from Gloucestershire, but by November he had moved to Staplehurst, Kent, and says "his orbit is as erratic as a comet's." February 1884 saw him again resident in Yorkshire, at Hawes, where "he is getting settled." He says that William Whitwell (whose obituary is in this *Report*) has some Oxfordshire records for me, including *Salsola Kali*, an alien. He wishes God-speed to the forthcoming Oxford Flora. In March I delighted him by sending him *Daphne Mezereum*, which I had just

found in Penley Wood (now in Bucks) with Raoul de Seigneux. In June he presses me to work the Lake District and go to his old Lincolnshire district to see his friend's (the Rev. W. Fowler) great find of *Selinum Carvifolia*. In December he writes that he "is busy with the *Flora of West Yorkshire*, towards which the Yorks. Nat. Union made a grant of £25." In 1887 he was at Heckmondwike, and says the compilation of his Flora has made him neglect all else almost. He thinks the long-rayed form of *Pulicaria dysenterica* (described by me in *Midl. Nat.* as var *longiradiata*) may be a distinct species. In 1888 the portly volume of the *Flora of West Yorkshire* appeared under the aegis of the Yorkshire Naturalists' Union, and he well deserved the high commendations passed on it. For a long time it will stand in the front rank of County Floras. Although it brought "no grist to the mill," he must have felt satisfied with the encomiums passed on it by those best qualified to judge. In 1898 he tells me all the *Helleborus viridis* in Yorks is *occidentalis*. He writes in 1902 asking for a reprint of the Dymchurch flora, which he says "all goes to aid the theory I am slowly developing of a natural change in the vegetation of all districts, slowest, of course, where the conditions change the slowest." In 1908 he tells me the *Supplement to the Yorkshire Flora* is complete, and he was keenly interested in the alien species which appear on and about the refuse from the skin-works at Meanwood. In 1909 he accompanied me to Upper Wharfedale to see *Cypripedium Calceolus*, of which we found several clumps, and I was fortunate enough to see one in flower. There we made the acquaintance of Mr Crowther, who showed us a perplexing growth of *Helleborine*, one of which (a hybrid) I named after him. In White's *History of Lincolnshire* in 1892 Lees contributed an article on the Botany and Outline Flora of that county, which was a useful contribution to the Lincolnshire flora. In after years he re-married and settled at Meanwood, Leeds. He sold his herbarium of about 25,000 sheets to the Bradford Corporation, where it is now in the Cartwright Hall, Lister Park, and his books are in the Bradford Reference Library. He retained his love of botany to the last. He was a frequent contributor to the *Naturalist*, not only in prose but verse; but his chief poetic effusions appeared in the *Yorkshire Weekly Post*. On September 17 last year I went to Leeds in order to be

shown by its discoverer (Mr R. W. Butcher) the new British species, *Tillaea aquatica*, which grew in the place where Lees had himself gathered *Limosella*. On the following Sunday I called on my old correspondent, who had been ailing, and to my grief found that he had died the day before. As will have been gathered, F. A. Lees was an energetic worker and an original thinker. It is to be regretted that he died before seeing his Supplement *The Vegetation of Yorkshire* through the press, but it is to be hoped that it will not be allowed to lapse. He was elected an Honorary Member of the Yorkshire Naturalists' Union in recognition of his services to science, and he was one of our three Corresponding Members, who are specially selected for their work at British Botany.

He left behind also an unpublished *Flora of Upper Wharfedale* in the hands of his close friend, Mr Joseph Fry Pickard, who wishes to add a few words to his memory:—"I have known him for about twenty-five years, and my association with him has been most intimate. His keen interest and love for the study of Botany never wavered, and up to his last illness he always had some new thought to expound or some original suggestion to make. Not only was his devotion to Botany intense, but he had a profound knowledge of words and dialects. But he never allowed these matters to interfere with his duty towards his medical work. It was a pleasure to see the interest he showed towards young beginners in Botany, and he made many friends with these awakening minds. He was of a somewhat shy disposition until he knew his man, then the real qualities manifested themselves, and his company was delightful. His wondrous collection of newspaper cuttings, illustrated and formed into booklets, dealing with a great variety of subjects to which notes of his own were added, was almost unique. Everything was indexed, and often catalogued. His method in detail was of the highest order. I cannot close without a sincere word of appreciation of Dr Lees' painstaking endeavours in the cause of science. We have lost a brilliant botanist, and we shall miss his original penmanship."

Meanwood, 24/11/1917.

Dear Druce,—Your sending me sample pages 5 and 6 of Allen Tweedsiders was welcome! (sincere thanks), and I wish now that

I had not, the day or two before, sent to the *Naturalist* for the December number my tentative account of the Alien Heron-bills of our waste-lands and arable fields here, though I did describe (after my own fashion) *Erodium Botrys* Bert. among the rest, including *E. cygnorum*, for the transmitted description of which I acknowledge your kindness. However, you'll see the article, I believe, through Sheppard, and, however you may smile at my commentary, will forgive. I burn to see the Tweedside thing, which, no doubt, will be full of applications to the aliens of our skin-yards and wool-wash out-throws. No doubt you are right, alpha to omega, about the "confused" sources of these strange flower faces: I've long noticed that "near east" and Mediterranean coastal things come to us directly from the Cape or Argentine; and your explanation is no doubt equally correct. I'm a good deal "up a tree" in naming the Chenopods called "Fat-Heans" (succulent poor things) hereabout, and the Docks, for we have one Australian and another New Zealand or Argentine form. Some are not allowed long enough on their "limits" to produce good seed, not being so early in maturing as *Erodium* or *Brassica*. I am delighted with the 1916 *Report*. It is magnificent reading—to me, though my son (who is no botanist) says it is like North's Sheep-head—"fine confused fare." The Goodyer account is fine, and the Plant Notes, pp. 397-434, more interesting and illuminative (to me) than anything you've yet done. Hazlitt once, in an essay, said about walking alone and observing:—"Isn't the wild rose sweet without any comment?" Yes, but your comments on *Aquilegia alpina* in Caenlochan Glen, *Scorozonera* in Dorset, &c., make the facts orient and golden. The *Anthriscus* pages of botanic pabulum, too, rejoiced me, and I can confirm much of what you say, both as to that and *Apium repens*. I will try and find you one or two selected examples of the last. But you will have seen what Col. Rawson said the other day *re* the influence of sunlight at certain times and in certain aspects upon the colour of flowers, and I note without surprise, as a thing "of course," G. West's assertion *re* the effect of growing energy exerted under water in case of root-drowned *Tussilago*: the anatomical structure of the rhizome and petiole is totally altered, becomes scalariform, &c., just as with the tiered root-crowns of the wet-ditch grown *Valeriana sambucifolia*. Yet that is just the same entity as *V.*

Mikanii (*officinalis*). In some places where a rocky limestone-soiled wood sheer slopes down to a slowish stream you can see in the ecads every gradation from one to the other. . . . This year, bitten in right hand by a dog in May, I've done little or no sampling, and I have no records save of a few aliens, which records convey nothing but the bare fact of chance. I've noted the big inodorous *Erodium moschatum* (Muscovy, not musky), Stork's-bill, in plenty, and found only one slight staminal difference from the scented type; and also the non-perfumed Mignonette, and have had it sent, too, from Calderside, Ravensthorpe. But a gardener here tells me that he has long noticed that now and then a few plants of sown mignonette in his pots and borders will come up, grow big, and never evolve any perfume. Is *odorata* a true species or a hortist's cultivated improvement? . . . But, O! my names from 1888 *Fl. W. Yk.*, which you have been unearthing, are not, I fear, to be depended upon. . . . I've found one *Scirpus*, but no *Cyperus* as yet. The waste scour-heaps get removed and spread over the land after lying one winter to "blet," and so perennials don't get much of a long rope. Vale.—Yours always truly, F. A. Lees.

I return the proof-marked page of a *Descriptive Adventive Flora of Britain*. What a chap you are for working. I visualise a picture of you, and how your eyes twinkle at congenial work: least alone when most alone!—F. A. L.

Lett, The Rev. Canon H. W., M.A., T.C.D., a distinguished Irish Cryptogamic Botanist. Born at Hillsborough, Co. Down, 1838; died at Aghaderg Glebe, Co. Down, December 1920. He assisted Stewart in the *Flora of the North-West of Ireland*, and Moyle Rogers named *Rubus Lettii* in his honour. It was at first considered endemic to Ireland, but has since been discovered in Wales. A well-known worker at Hepatics, in 1902 he published a List, with descriptive Notes, of all the species of British Hepatics hitherto found in the British Isles.

Miall, Louis Compton, F.R.S. Born at Bradford, 1842; died at Far Headingly, Leeds, February 1921. He was the first Professor of Botany in the Yorkshire College of Science, and continued as such in the University of Leeds until 1907. The *Times* says in warm

encomium—"As a naturalist he was imbued with the spirit of Gilbert White, and was an enthusiast for what he called 'live natural history.' This spirit was most highly evinced in his two remarkable books, *Round the Year* and *House, Garden, and Field*, as well as in a scholarly edition of the *Natural History of Selborne*." Among his other publications may be mentioned *The Early Naturalists: Their Lives and Work*, 1530-1789, which is a book which should be in every naturalist's library.

M'Intosh, Charles, of Inver. Charles M'Intosh was born at the little hamlet of Inver, near Dunkeld, on the 27th March 1839. His education, scanty enough, was obtained at the village school. As a youth he worked in a sawmill, but an accident by which the fingers of his left hand were badly mutilated put an end to that occupation. Shortly after he became a rural postman, and continued at that till age brought on retirement. For forty years also he acted as precentor in the Parish Church of Little Dunkeld, and he derived much pleasure from the study and practice of music, being no mean performer on the violoncello. At an early age he began to take an interest in flowers and insects and other natural objects, but it was not till 1872, when the late Dr Buchanan White, while staying at Dunkeld, made his acquaintance and asked his help to explore the flora of the district, that he began the systematic study of nature. He was of great assistance to Dr White in many ways, notably in collecting the Willows, Roses, and Hawkweeds of the neighbourhood. By the Doctor's advice and assistance he turned his attention to the Mosses and Fungi of the locality. At a great Fungus show held in Perth in 1875 he exhibited specimens of the splendid *Pholiota aurea*, its first discovery in Britain, I believe. His fine collection of Mosses was presented by him, about a year ago, to the new School of Forestry at Dunkeld. In after years he turned his attention successively to the Uridineae, the Pyrenomycetes (of which his collection is in the Perthshire Herbarium), and latterly to the Discomycetes, of which he discovered several new to Britain and a few new to science. The microscope was always to be seen standing on his table in his little cottage at Inver. But though Botany was his special study, he was an all-round naturalist. Birds received much of his attention: why some species increased whilst others decreased, and the different

effects of hard and mild seasons upon their numbers in general. The Insects of the district, as well as the Mollusca, were familiar to him, and, indeed, nothing which had life escaped his notice. On several occasions he was able to give valuable information to experts who came to investigate the pests which attack trees, especially the Conifers, which are so abundant in the neighbourhood of Dunkeld and Murthly. He was proud of the beautiful scenery amidst which he lived. It never palled upon him; its changing aspect under changing skies kept its charm ever fresh. Apart from his attainments, the man himself was worthy of all the respect with which he was universally regarded. Thoroughly upright and trustworthy, he was always ready to oblige, and his frank and genial manner, enlivened by a touch of humour, endeared him to his friends. Big and powerful of frame, he enjoyed good health till within a month or two of the end, and never lost the zest of life. He quietly breathed his last on the 5th of January last, and thus came to an end a lowly but useful and on the whole a happy life. W. Barclay.

Rolfe, Robert Allen, A.L.S. Born at Ruddington, near Nottingham, on 12th May 1855; died at Kew on 13th April 1921. The death of Mr Robert Allen Rolfe, which took place at Richmond, Surrey, in his sixty-sixth year, has deprived British Botany of an earnest and successful votary, and rendered the science he loved the poorer by the loss of a worker whose reputation as an orchidologist was world-wide. Rolfe, after leaving school, was trained as a gardener. For a time he worked in the gardens at Welbeck Abbey, whence he entered Kew in 1879. A vacancy having occurred in the Herbarium Staff at Kew in 1880, Rolfe was the successful competitor at the examination of candidates for the post. By way of recreation rather than as part of his routine duties he took up the study of galls, his first paper on the subject appearing in 1881. His interest in this study never abated, though the fact that he was an authority of high rank in this particular field was probably unknown to all save the few workers who give it special attention. His routine duties involved, in his earlier years of herbarium work, a close study of the flora of the Philippines, the results of which were published in 1885. This work was of such excellence as to lead to his election as an Associate of the Linnean Society. He now added

to what may be termed his recreations the study of hybrids, his first contribution to which appeared in 1887. Rolfe's position as an authority in this field, though as well-deserved as that acquired by him as a student of galls, was probably as little realised by the majority of his systematic contemporaries. It was, however, fully appreciated by those engaged in practical garden craft, with whose difficulties Rolfe, thanks to his own early training, was familiar, and to whose needs he gave, throughout his career, the most sympathetic attention. His routine duties had in the meantime made him turn his attention to the Orchidaceae, and led to the publication by him in 1886 of a revision of the genus *Phalaenopsis*. The judgment revealed in this paper led his immediate superiors to encourage him to devote especial attention to this family. Other papers on Orchidaceae followed, and by 1893 his reputation as an authority on the family had become so thoroughly established that he was able to found the *Orchid Review*, the special organ of cultivators of Orchids in Britain, which he edited with success, though, it is to be feared, at the expense of such sustained labour during hours that might otherwise have been given to legitimate recreation and leisure as to impair his health. From the time of the foundation of the *Orchid Review* Rolfe held in the gardening and the botanical world alike a position comparable with that held up to 1864 by the late Professor Lindley, and that subsequently held by the late Professor Reichenbach. Endowed with a vigorous constitution, Rolfe for nearly thirty years crowded into his days and nights the labours of two ordinary mortals. His last illness and death were unexpected, for before he was laid aside he had in contemplation two important tasks—that of comparing at Vienna the species of Orchids it had fallen to him to characterise from 1886 onwards with the types of the species described by Reichenbach, which, in terms of the last testament of that distinguished man, had been sealed up at Vienna for a quarter of a century, and that of visiting in person certain regions in tropical America whence so many of the species in cultivation with which he had been compelled to deal in the course of his official duties had originally come. The frustration of these plans renders still more irreparable the loss sustained by botanical science through the disappearance of the unique and peculiar knowledge of which Rolfe was the possessor. The prescience shown by the Linnean Society in

honouring itself by choosing Rolfe as one of its Associates almost at the outset of his career, and long before he became the recognised authority as regards Orchids in this country, has already been indicated. The esteem in which he was held by orchidologists abroad, both for his character as a colleague and for his authority in their particular field of study, was shown by the number and nature of the letters of regret evoked by his death from correspondents of Kew in every civilised country. His own Ministry had shown the esteem in which his attainments were held in this country by inviting him, in the public interest, to remain in its service after he had attained the age of sixty-five, at which public servants are normally retired. Early in his career the Royal Horticultural Society made him one of its corresponding members, and was thereby able to avail itself of his invaluable services as a member of its powerful Orchid Committee. But it was not until Rolfe was stricken by the illness which was to prove fatal that this body, to which he had so long rendered yeoman service, bethought itself of honouring him by the bestowal of its Victoria Medal of Honour. D. PRAIN.

WHITWELL, WILLIAM. Born at Manchester 1839; died at Dorridge, near Birmingham, December 1921. He entered the service of the Inland Revenue, and among other places was stationed from 1870 to 1877 at Oxford, where he did some botanising, and a few of his records are included in the Oxfordshire Flora. He then went to the south of England, and for some years lived at Balham. In 1886 he recorded the occurrence of *Anemone nemorosa*, var. *coerulea*, in 1870 near Tunbridge Wells (*Journ. Bot.* 157, 1887); he also noted (*l.c.*, 56) that *Silene Otites* grew on the wall of Colchester Castle, where it seems it was planted by local lepidopterists as a larval food. One of his best finds was that of *Polygala austriaca* near Caterham, Surrey ((*l.c.*, 249, 1888); and (*l.c.*, 314 and 354, 1889, and 282, 1890) he gives an account of *Arenaria gothica* found in Yorkshire by Mr Rotheray. In 1891 (*l.c.*, 308) he recorded some plants for Monmouth; *Sonchus arvensis*, var. *angustifolius*, in Lancashire (*l.c.*, 247, 1894); *Impatiens Noli-tangere* in Montgomery and Salop (*l.c.*, 117, 1895); and he wrote East Sussex Notes (*l.c.*, 103, 1902), mentioning the alien *Festuca heterophylla*. In 1898 he recorded (*l.c.*, 33, 1898) *Euphorbia*

prostrata from a nursery garden at Christchurch, Hants. His most important paper (*l.c.*, 291) was on the alleged occurrence of *Botrychium matricariaefolium* and *B. lanceolatum* in Britain. Neither of these have since been confirmed and await discovery. Montgomeryshire Notes appeared in 1896 (*l.c.*, 172, 511). In 1893 he contributed to our Club a curious form of *Thalictrum flavum* from Llansilin, Denbigh, which the Rev. E. F. Linton there named *rufinerve* Lej. & Court., a determination I doubt. The plant had an earlier history. It was originally sent to the Botanical Exchange Club in 1875 by Miss Foulkes-Jones, who found it at Llansilin. At that time Boswell Syme referred it to var. *nigricans*, and in this Mr J. G. Baker agreed. Whitwell had roots from Miss Foulkes-Jones, so this was the same gathering which I submitted to Herr J. Freyn, who named it *T. gallicum* Rouy. A renewed investigation is desirable. I have seen it in gardens in Carnarvonshire as a tall plant, six feet high. Whitwell took considerable interest in the Berkshire Strawberry (*Fl. Berks* 189), and he grew it for many years. An impulsive critic said it was *F. elatior*, and Whitwell, writing on October 29, 1900, from Balham, says:—"You asked me to take notice of the flowers of your *F. bercheriensis* this season in respect of the question whether the plant is not really *elatior*. I have done so, and have dried an excellent series showing flower-buds, flowers, and the fruit in various stages up to ripeness. The suggestion that it may be *elatior* has surprised me. The form seems to be quite different; the petals are purely orbicular; those of *elatior* are narrowed into a decided claw, and are also slightly elongated. The inflorescence in *elatior* is more erect, and calyx, pedicels, and leaves are much more hairy than in your plant. The leaves are intermediate in form between *vesca* and *elatior*. F. A. Lees at once said that it was manifestly different from *elatior*; it could not be that. Also that it was in various points distinguishable from *vesca*. . . . I have remarked before on the extreme lusciousness of your ripened fruits: three or four under gentle pressure for drying scented my study almost overpoweringly—more than a plateful of purchased strawberries would have done." These remarks have been quoted to show Whitwell's power of critical observation. Incidentally, they throw a side-light on Count Solms-Laubach's

matured opinion, namely, that *bercheriensis* was a variety of *vesca* which at one time had been cultivated, and had now to some extent reverted to *vesca*, *i.e.*, it is neither *elatior* nor *vesca* × *elatior*, which he at one time thought might be its origin. Whitwell in 1902 went to live at Lower Hagley, but lost his *Fragaria* in the removal. He had a good botanical library, and it was hoped that he might have done much good work, but he was in very delicate health, and even in 1900 says "his powers of continuous and concentrated work remain painfully small, but has recovered a little of the ability to write, though only a little," and then he was chained to the oar by having his bed-ridden father living with him, then in his 90th year, and had only Whitwell to watch over him. Even in 1903, after his removal to Lower Hagley, he laments the lack of improvement in his health, and that although only 64 years of age he is only able to walk 5 or 6 miles, "while his friend Bagnall, who is 73, often does 30 miles a day, and not long ago accomplished 34 miles." One should add that Whitwell assisted Arnold Lees in indexing the *Flora of North-West Yorkshire*, and that he published a lecture on the "Life of a Fern," which he gave before the Welshpool Naturalists' Field Club, in which he alludes to many of the Ferns of Montgomeryshire.

NEW COUNTY AND OTHER RECORDS.

ABBREVIATIONS.—*Fern. Gaz.* = *The British Fern Gazette*, edited by F. W. Stansfield; *Gard. Chron.* = *The Gardeners' Chronicle*; *Ir. Nat.* = *The Irish Naturalist*; *Nat.* = *The Naturalist*; † = Adventive; * = New County Record (in the case of adventive plants this is only rarely added); ! placed after a plant name signifies that the compiler has seen the specimen; ! placed after a locality that the compiler has seen it there; × placed before one or between two scientific names means that the plant is a hybrid; 52, etc., numbers following a county refers to the Watsonian vice-county; [ ] enclosing a record means that confirmatory evidence is needed, or that the plant is not British.

4. THALICTRUM MINUS L. (*montanum*). Paviland Cliffs, Glamorgan, WAKEFIELD & WEBB.

†10. ANEMONE RANUNCULOIDES L. On a hedge bank, Sewerby, York, R. J. FLINTOFF.

†13. A. JAPONICA S. & Z. Alien. Churchill Heath, Oxon, Miss FOWLER, with *A. apennina* L. Known for many years.

17. MYOSURUS MINIMUS L. Artington, Surrey, O. LATTER, *in litt.*

*21. RANUNCULUS AURICOMUS L. Ballycarew, Wexford, MOFFAT in *Irish Nat.* 72, 1921.

23. R. LINGUA L. Hunmanby, near Bridlington, York, FLINTOFF.

*38. R. TRICHOPHYLLUS Chaix. Near Loch Spiggie, Shetland. (Beeby's *trichophyllus* from Walls turned out to be *Drouetii*.)

*40. R. HETEROPHYLLUS Web. Dunean Loch, Fife, TEMPLEMAN. Forma GODRONII. Carlton Field, Notts, R. BULLEY.

41. R. PSEUDOFLUITANS Baker & Foggitt. Wollaton Canal, Notts, R. BULLEY.

47. R. FICARIA L., f. LUXURIANS Moss. Brixton, Isle of Wight, probably only a state induced by growing in wet places, DRUCE.

48. CALTHA PALUSTRIS L., var. GUERANGERII (Bor.). Between Hartford Bridge and Bramshill, Hants, J. W. THOMPSON. Var. MINOR DC. Carnedd Dafydd (2900 ft.), Carnarvonshire, DRUCE.

*52. HELLEBORUS FOETIDUS L. Llandifaelog, Carmarthen, BARKER. Not native. Sewerby, York, FLINTOFF.

†55. NIGELLA DAMASCENA L. Hortal. Longland Bog Cliffs, Glamorgan, WEBB.

†56. N. ARVENSIS L. Uxbridge, Middlesex, Mrs. WEDGWOOD.

77. CASTALIA ALBA Wood. Llanaber, Merioneth (lacked pers. auth.), DRUCE.

80. PAPAVER RHOEAS L., var. HOFFMANNIANUM Kuntze. Wilsford, Wilts, DRUCE. Var. VIOLACEUM Bréb. Near Eastbourne, Sussex, C. NICHOLSON.

†93. ESCHSCHOLZIA DOUGLASII Walp. Near grain-store, Dalmuir, Glasgow, GRIERSON.

†101. CAPNOIDES LUTEA Gaertn. Fruiting at Torquay, C. BAILEY, and at Radley, Berks, VINCENT.

104. FUMARIA PALLIDIFLORA Jord. Conwyl, Carmarthen, BRUNKER, ex HAMER.

*108. F. MURALIS Sond., var. DICIPIENS, but fruit required (teste Pugsley) for precise identification, Parkstone, Dorset, Miss TODD.

†131. BARBAREA INTERMEDIA Bor. Gravel pit, Chichester, LITTLE.

138. ARABIS ALPINA L. Still in the spot where we saw it on the Cuchullin, Skye, in 1907; just over flower on July 13, 1921, DRUCE.

†*141. A. GLABRA Bernh. Ibrox, Glasgow, GRIERSON.

142. CARDAMINE PRATENSIS L. Beautiful flore pleno plants. Between St Anne's Hill and Thorpe, Surrey, Miss TULK.

143. C. AMARA L., var. ERUBESCENS Peterm. Bungay, Suffolk, Miss COBBE; Burnhall, York, T. C. TAYLOR.

†149. LUNARIA REDIVIVA L. Chadlington, Oxon, DRUCE; Pennal, Merioneth, Mrs WEDGWOOD; Dundee, Forfar, DRUCE; near St Asaph, Flint, B. ALLEN.

†158. ALYSSUM MARITIMUM Lam. Bexhill, Sussex, H. L. GREEN.

†159. DRABA AIZOIDES L. Planted on a wall at Charmouth, Dorset, TEMPLEMAN.

161. D. INCANA L., var. CONFUSA (Ehrh.). Caenlochan, Forfar, PATTON.

†176. HESPERIS MATRONALIS L. Havant, S. Hants, HILLARD; Goathland, York, FLINTOFF.

†177. WILCKIA MARITIMA Scop. Near Goathland, York, FLINTOFF; Port Talbot, Glamorgan, WEBB.

†183. SISYMBRIUM SOPHIA L. Gwys, Brecon, WEBB.

†185. S. ORIENTALE L. Colchester [Ref. No. 1884], BROWN; Chipping Norton, Oxon, DRUCE; St Ouen's Bay, Jersey, as *Brassica*, PIQUET; Uxbridge, Middlesex, TRETHEWY; Minford, Merioneth; Gloucester Dock, GAMBIER-PARRY.

†187. S. LOESELII L. Eltham, Kent, Mrs WEDGWOOD.

†195. ERYSIMUM HIERACIFOLIUM L. Meole Brace, Salop, MELVILL.

197. E. CHEIRANTHOIDES L. Havant, S. Hants, Miss HILLARD.

†198. E. REPANDUM L. Hertford, 1845, as *C. Cheiri*, ANSELL in *Hb. Druce*, and at Ware, 1914, Mrs WEDGWOOD.

†200. CONRINGIA ORIENTALIS Dum. By the railway at Grosmont, N.-W. Yorks, FLINTOFF; near Trefnant, Denbigh, B. ALLEN.

†202. CAMELINA SATIVA Cr., var. PILOSA (DC.)=FOETIDA. St Ouen's Bay, Jersey, 1896, PIQUET.

*205. BRASSICA OLERACEA L. Walberswick, E. Suffolk, W. G. CLARKE.

†212. B. ELONGATA Ehrh. Grosmont, Goathland, N.-W. Yorks, FLINTOFF.

*215. B. NIGRA Koch. Pembrey, Carmarthen, BARKER, ex HAMER.

†222. B. POLLICHII (Sch. & Sp.) Druce = B. GALLICA (Willd.). Winchester, Miss TODD; Newhaven, Sussex, Mrs WEDGWOOD.

†224. B. INCANA Schultz. Newhaven, Sussex, Lady DAVY.

†228. ERUCA SATIVA Mill. Monks Meadow, Gloster, ex RIDDELSDELL.

†228 (2). E. CAPPODOCICA Reuter. Glasson Docks, Lancs, Miss A. B. COBBE.

*232. BURSA BRITTONII (Almq.). Dundee, Forfar, DRUCE.

B. BATAVORUM (Almq.). St Helier, Jersey; (S. Servan, Brittany), DRUCE; Grangetown, Cardiff, 1920, WADE, as var. *densiflora*—see *Rep. B.E.C.* (the smaller species only) 214, 1920; Erith, Kent; Bradford, York, DRUCE.

B. ANGLICA (Almq.). Balta, Shetland; Yardley Gobion, Northants; Sible Hedingham, Essex, DRUCE.

B. CONCAVA (Almq.). Mallow, Cork, September 1921, DRUCE.

B. BREMENSIS (Almq.). Walmer, E. Kent, H. E. Fox. See *Rep. B.E.C.* 214, 1920.

B. BELGICA (Almq.). Lerwick, Shetland, DRUCE.

B. DRUCEANA Almq. Killarney, Kerry, DRUCE.

B. GERMANICA × PATAGONICA? Cottenham Park Road, West Wimbledon, Surrey, 1921, C. E. BRITTON [n. 590], queried as this by Dr Almquist. Mr Britton had suggested a hybrid origin of this sterile plant.

(B. LAEVIGATA (Almq.). Zeebrugge, Belgium, 1921, DRUCE.)

†233. CORONOPUS DIDYMA Sm. Charterhouse, Surrey, O. H. LATTER.

236. LEPIDUM LATIFOLIUM L. Gloster Dock, GAMBIER-PARRY; †*on grass by the roadside, Potterne, Wilts, GWATKIN.

†239. L. PERFOLIATUM L. Carmarthen, HAMER; Galway, TRETHEWY.

240. L. RUDERALE L. Porthdinlleyn, Carnarvon, GENNER.

†240 (2). L. NEGLECTUM Thell. Thetford, Norfolk, Miss COBBE.

†241. L. SATIVUM L. Hayling Island, S. Hants, with mauve flowers, HILLARD; Carshalton, Surrey, BISHOP.

†247. L. DENSIFLORUM Schrad. Gloucester, GAMBIER-PARRY; Glasgow, GRIERSON; Watton, Norfolk, Mrs WEDGWOOD.

†247 (17). L. SCHINZII Thell. Bradford, York, CRYER, with *L. sagittulatum* Thell. and *L. hyssopifolium* Desf., etc.

†247 (31). L. RAMOSSISSIMUM Nels. Southampton, RAYNER; Glasgow, GRIERSON.

*249. THLASPI ARVENSE L. Carmarthen, HAMER.

250. T. PERFOLIATUM L. Prestwood, Bucks, confirmatory record, ADRIANA WHITE; Quarry, Bearborough, Cutsdeane, Worcester, R. BUTCHER.

*251. T. ALPESTRE L. By the River Ystwyth, near Llanychaiarn, Cardigan, a few feet above sea-level, as a form approaching *occitanicum*, MARQUAND.

†258. VOGELIA PANICULATA Hornem. North Cadbury, N. Somerset, BOYS; Acton, Middlesex, Mrs WEDGWOOD.

*291. VIOLA STAGNINA Kit. W. Dereham Fen, W. Norfolk, A. TEMPLEMAN.

294. V. RIVINIANA Reichb., var. PSEUDOMIRABILIS. Lough Corrib, Galway, Mrs EVANS & A. W. TRETHEWY; Gap of Dunloe, Flesk Valley, Kerry; Shetland, DRUCE. × RUPESTRIS. Rozel, Jersey, DRUCE; near Dyers Farn, Langley; Hitchin, Herts, LITTLE.

*295. V. RUPESTRIS Schmidt. At Langley, Herts, with above, LITTLE.

296. V. CANINA L. Bressay, Shetland. Var. CALCAREA Reichb. Balta, Unst, DRUCE. × RUPESTRIS. Cronkley Fell, York, KEW, but Mrs Gregory would like more advanced specimens. × STAGNINA. Dereham Fen, W. Norfolk, A. TEMPLEMAN.

298. V. ODORATA L., var. PRAECOX. Potters Pury, Northants, DRUCE.

298 (2). V. FLORIBUNDA Jord. Still at Cobham, Kent, a form with remarkably large flowers, Mrs STEVENS.

*301 (2). V. EPIPSILA Ledeb. Glen Cahir, Clare, DRUCE. Var. GLABRESCENS. Mallow, Co. Cork, DRUCE.

304. V. LLOYDII Jord. Carmarthen, BARKER; *Tingwall, Shetland; near Kirkwall, Orkney, DRUCE.

304. V. SEGETALIS Jord. Parkstone, Dorset, Miss TODD.

*308. POLYGALA SERPYLLACEA Weihe. Commin-y-Rhos, Glamorgan, WEBB.

310. P. DUBIA Bellynck. Tenby, Pembroke; Dancing Ledge, Dorset; Wye Downs, Kent; Hartland Point, N. Devon; St Ouen's, Jersey, DRUCE.

†320. DIANTHUS BARBATUS L. In a wood near Powick, Worcester, Miss BOLTON; waste ground, Dundee, Forfar, DRUCE.

†328. GYPSOPHILA PANICULATA L. Blackpill, Glamorgan, on ballast, WEBB.

†330 (2). G. ELEGANS Bieb. Glasgow, GRIERSON.

†331. SAPONARIA VACCARIA L. On rubbish on the beach, Auchindour, Westerness, WEBB.

336. SILENE CUCUBALUS Wib., var. RUBRA (DC.) Druce. See *Rep. B.E.C.* 188, 1915. Hythe Quay, Colchester, BROWN.

†342. S. GALLICA L. Bradford, York, CRYER; Glasgow, GRIERSON.

†347. S. ARMERIA L., var. SPARSIFLORA Schur. Near Exeter, Miss TODD.

*357. CUCUBALUS BACCIFER L. Among low shrubs on a cliff overhanging the sea at Woody Bay, N. Devon, 1920, Rev. H. E. FOX. A very interesting discovery. Its occurrence here has to be accounted for. Can it have come with shrubs, or is it native?

*372. CERASTIUM PUMILUM Curt. Very plentiful on the Great Orme, Carnarvon, March 1921, Rev. E. M. REYNOLDS. An important extension northwards of its range.

*373. C. SEMIDECANDRUM L. Carmarthen, BARKER, ex HAMER.

374. C. SUBTETRANDRUM Murb. Black Holm, 1916; Eday, S. Ronaldsay, Hoy, Col. JOHNSTON. I have not seen the specimens of this very critical plant, which should be authenticated by Murbeck or Ostenfeld.

*380. STELLARIA NEGLECTA Weihe, var. UMBROSA Opiz. Waulkmill Bay, Orkney, 1920, DRUCE.

382. S. DILLENIANA Mönch. Fen, Shouldham, W. Norfolk, LITTLE.

†418. CLAYTONIA SIBIRICA L. Bredon Hill, Worcester, C. REA.

*424. ELATINE HEXANDRA DC. Hensoe, Glamorgan, Miss VACHELL. An excellent addition to the county flora.

435. HYPERICUM DESETANGSII Lam. Lewes, Sussex, 1850, IBBOTSON, in *Hb. Druce*.

†445. LAVATERA CRETICA L. Bradford, York, CRYER.

†456. MALVA PARVIFLORA L. Christchurch, S. Hants, as var. *microcarpa* Losc., Miss TODD.

465. TILIA ULMIFOLIA Scop. Dolgelly, Merioneth, DRUCE; *Gwynfey, Carmarthen, HAMER; Boot, Cumberland, J. F. PICKARD, ? planted.

477. GERANIUM SYLVATICUM L., var. or sub-var. ROSEUM Druce. Nent, Alston, Cumberland, WATERFALL.

478. G. PRATENSE L. Near Penrice Church, Glamorgan, ? if adventive, WEBB.

†479. G. ENDRESSI Gay. Skelwith, N. Lancs, J. W. H., ex RIDDELSDELL.

†479. G. PHAEUM L. Horbling, near Billingborough, Lincs, Miss LANDON; Sleights, near Whitby, York, FLINTOFF; Holt Park, Windermere, Mrs EVANS.

*483. G. DISSECTUM L. Garden weed at Balta, Shetland, DRUCE.

†490 (3). ERODIUM BRACHYCARPUM Thell. Shirley and Bradford, York, CRYER; Meanwood, Leeds, DRUCE.

†491. E. CHIUM Willd. Countess Wear, Devon, D'URBAN. Perhaps a form of this, teste Dr Thellung.

497. E. CICUTARIUM Ait., var. TRIVIALE (or near it). Dog's Bay, Galway, DRUCE, teste BAKER.

†499. E. CYGNORUM Nees. Railway between Nailsworth and Dunkirk, W. Gloster, 1865, spec. ex RIDDELSDELL.

†501. TROPAEOLUM MAJUS L. Mayals, Glamorgan, WEBB.

504. OXALIS ACETOSELLA, L., var. SUBPURPURASCENS DC. Challock, near Ashford, Kent, H. L. GREEN.

†505. O. CORNICULATA L., var. PURPUREA Parl. Bexhill, Sussex, H. L. GREEN.

†508. O. VIOLACEA DC. Near Welbeck, Notts, GOULDING.

†509 (2). O. FLORIBUNDA Lehm. Helensburgh, Dumbarton; Bray, Dublin, GRIERSON.

†512. IMPATIENS PARVIFLORA DC. Wood near Stanley, Staithe; near Beccles, Suffolk, Rev. G. HALLIDAY.

†513. I. GLANDULIFERA Royle. Near Newark, Surrey, Lady DAVY.

†515. RUTA GRAVEOLENS L. Bexhill, Sussex, H. L. GREEN.

†522. VITIS HEDERACEA L. Marston, Oxon, DRUCE.

526. ACER CAMPESTRE L. A tree, 35 feet high, near Welshpool, Montgomery; *Penruddock, Cumberland, J. A. WEBB. Var. INCISIFOLIA. Ufton, Warwick; Twinstead, N. Essex, DRUCE.

†528. LUPINUS NOOTKATENSIS Donn. On shingle of the Lochy, near Inverlochy Castle, Westerness, WEBB.

†529. L. ANGUSTIFOLIUS L. In a field, on the blue galt, sown with beans, at the base of the North Downs, between Woldingham and Oxted, Surrey, Rev. E. C. CRUTWELL; Radyr, Glamorgan, SMITH.

†531. LABURNUM ANAGYROIDES Med. Semi-wild in Lady Portsmouth's Park, Hants, BOYS; Greenhithe chalk-pit, Kent; Fairford, Gloster, DRUCE; spreading to limestone cliffs at Langland, Glamorgan, WEBB.

†554. TRIGONELLA M.-CAERULEA (Ser.) Druce. Eltham, Kent, 1921, Mrs WEDGWOOD.

†578. MEDICAGO PRAECOX DC. Abingdon, Berks, GAMBIER-PARRY.

†579. M. HISPIDA Gaertn., var. CONFINIS Burnat. [Ref. No. 1798.] Hythe Quay, Colchester, BROWN.

586. M. LUPULINA L., var. WILLDENOWIANA Koch. Radyr, Glamorgan, SMITH; Kirkwall, Orkney, DRUCE.

†597. MELILOTUS INDICA All. Minfford, Merioneth, GAMBIER-PARRY.

599. TRIFOLIUM PRATENSE L., var. PARVIFLORUM Bab. Dundee, Forfar, DRUCE.

†605. T. LAPPACEUM L. Eltham, Kent, Mrs WEDGWOOD; Leith, FRASER.

610. T. STELLATUM L. After many vicissitudes this clover reappeared at Shoreham, Sussex, in 1921, Miss COTTIS; with other aliens at Fforestfach, Glamorgan, ROWLANDS, ex WEBB.

619. T. STRIATUM L., var. ERECTUM Gasp. Tresco, Scilly, Dr H. DOWNES.

621. T. FRAGIFERUM L. On a dry football field, Swansea, abundant, WEBB.

†626. T. STRICTUM L. Leith, FRASER, with *T. Michelianum* Savi, etc.

628. T. REPENS L., var. RUBESCENS Ser. Ranworth, E. Norfolk, Mrs WEDGWOOD.

†630 (2). T. ISTHMOCARPUM Brot. Leith Docks, FRASER; Byfleet, Surrey, DRUCE.

†638. T. FILIFORME L. Leith Docks, FRASER.

641. ANTHYLLIS VULNERARIA L., var. BICOLOR (R. & F.). Birling Gap, Sussex, Mrs WEDGWOOD.

648. LOTUS TENUIS Kit. Leighton Buzzard, Beds, TEMPLEMAN. Rare in the county, whence I first recorded it from Twin Woods in 1896.

†665. SCORPIURUS SUBVILLOSA L. Leith Docks, plentiful, with *S. vermiculata*, FRASER.

†666. CORONILLA VARIA L. The Rev. H. H. Harvey says he got it at Ashwater, S. Devon, some years ago. Mr Wise found it at Lipton Quarries previous to that. Llandefailog, Carmarthen, BARKER.

†686. VICIA CALCARATA Desf. Colchester, BROWN.

†690. V. NARBONENSIS L. Tenbury, Worcester, 1915, Mrs WEDGWOOD.

†695. V. MELANOPS Sibth. & Sm. Frome, Somerset, Mrs WEDGWOOD.

†697. V. CORDATA Wulf. Colchester, BROWN; Hayes, Kent, Mrs WEDGWOOD.

†701. V. PEREGRINA L. Colchester, BROWN.

706. V. GRACILIS Lois. Shenley Hill, Beds, TEMPLEMAN.

710. LATHYRUS SYLVESTRIS L., var. LATIFOLIUS Peterm. Caldy Island, Pembroke, ARNETT.

†711. L. TUBEROSUS L. Near Dartmouth, Devon, found by a Cadet, R. MILNE.

712. L. MARITIMUS Big. Salthouse, E. Norfolk, HORWOOD.

†717. L. INCONSPICUUS L. Hertford, A. W. GRAVESON.

†718. L. HIRSUTUS L. North Cliff, Bridlington, York, FLINTOFF.

†721. L. CICERA L. Hythe Quay, Colchester, BROWN.

†724. L. OCHRUS L. Colchester, BROWN.

729. L. MONTANUS Bernh., var. TENUIFOLIUS Garcke. Aymestrey, Hereford, DALTRY.

*738. PRUNUS CERASUS L. Carmarthen, KNIGHT, ex HAMER.

746. SPIRAEA ULMARIA L., var. DENUDATA Boenn. Potterne, Wilts, GWATKIN; Mallow, Cork, DRUCE.

†848. RUBUS SPECTABILIS Pursh. Duff House Grounds, Banff, with **R. nutkanus*, WATT in *Glasgow Nat.* 66, 1918.

883. GEUM INTERMEDIUM Ehrh. Ufton Wood, Warwick, also a form with a single, rose-coloured, sessile flower, DRUCE.

†885. FRAGARIA MOSCHATA Duch. Site of an old cottage, destroyed about 40 years ago, Potterne, Wilts, GWATKIN.

886. F. VESCA L. With white fruit, Bramshill Wood, N. Hants, Mrs THOMPSON.

†896. POTENTILLA INTERMEDIA L. Gloucester Docks, GAMBIER-PARRY.

901. P. REPTANS L. With trifoliate leaves, Aldwick, Bognor, W. Sussex, LITTLE.

†904. P. ALBA L. On the grassy bank of a garden which until recently had been virgin wood, " evidently not intentionally planted and apparently quite wild," Hythe, Kent, Mrs MURRAY. Doubtless introduced. See " Dubious Plants," in *Rep. B.E.C.* 756, 1919.

909. ALCHEMILLA MINOR Huds. Setter, Syradale, Kirbister, Orkney; near Morley Bridge, Kerry, DRUCE.

909. A. ALPESTRIS Schmidt. *Balta, Shetland; Kirbister, Orkney; *near Montgomery, DRUCE.

†916. ACAENA ANSERINIFOLIA (Forst.) Druce (= *Sanguisorbae*). Near Lucan, MOFFAT; Rostrevor, in the grounds of Sir J. Ross at Bladensburg, PRAEGER in *Irish Nat.* 1921. Doubtless here of hortal origin.

*931 (2). ROSA ACICULATA grex. One of the roses of this rare British group was found on the border of Whittlebury Forest, Northants, in October last. It had very large fruit with subpersistent sepals; leaves biserrate, hairy on the under surface; the peduncles densely aciculate with gland-topped setae, DRUCE.

950. R. RUBELLA Sm. Col. Wolley-Dod so names a red-flowered *spinosissima* Rose from Dog's Bay, Galway, collected by Mrs WEDGWOOD in September 1920. I have the same plant from Co. Clare, but doubted its identity with *rubella* Sm., DRUCE.

963. PYRUS TORMINALIS Ehrh. Layer Marney, Essex, BROWN.

966. CRATAEGUS MONOGYNA Jacq., var. LACINIATA Wallr. Mallow, Cork, DRUCE; Lochyside, Westerness, with var. *incisifolia* Druce, WEBB.

†972. COTONEASTER MICROPHYLLA Wall. Bont Newydd, Carnarvon, B. ALLEN; edge of Lingholm Wood, Cumberland, J. A. WEBB.

†972 (2). C. SIMONSII Baker. Island in Lough Corrib, Galway, TRETHEWY.

†972 (3). C. FRIGIDA Lindley. In a hedge at Bishops Stortford, Hants, Hon. Mrs LEITH.

975. SAXIFRAGA OPPOSITIFOLIA L. Cwm Tarrell, B. A. WILLIAMS.

978. S. DECIPIENS Ehrh. Sea scarp of Croaghmore, on Clare Island, 200-1200 ft., PRAEGER.

*1010. SEDUM FABARIA. Carmarthen, HAMER.

*1011. S. RUPESTRE Huds., var. MINUS Syme. Llangunnor, Carmarthen, HAMER.

†1012. S. REFLEXUM L. St Clears, Carmarthen Walls, HAMER; In masses on rock, Llandewir Cwm; Builth, nowhere near houses, WEBB.

1014. S. SEXANGULARE L. Langdon, near Tewkesbury, W. Gloster, Miss VACHELL.

*1045. LYTHRUM HYSSOPIFOLIA L. Hayling Island, S. Hants, Miss HILLARD. A capital discovery. Alien at Burnley, Lancs, TRAVIS.

1052. EPILOBIUM ROSEUM Schreb. Hambleden, Bucks; Meanwood, Leeds, DRUCE.

1054. E. MONTANUM × PARVIFLORUM. Swaythling, S. Hants, RAYNER.

1055. E. ALSINEFOLIUM × PALUSTRE. Margin of Maze Beck, near Caldron Snout, H. W. KEW.

1057. E. PALUSTRE × PARVIFLORUM. Ippolyts Common, Hitchin, Herts, LITTLE.

1059. LUDVIGIA PALUSTRIS Ell. Plentiful this year in its old station in the New Forest. Miss TODD also found it in a pond about two miles from Romsey, S. Hants.

†1067. OENOTHERA LACINIATA Hill (*sinuata*). Gloucester,

Mount Meadow, GAMBIER-PARRY; Knap Mill, Christchurch, S. Hants, Miss TODD.

†1075 (6). CUCUMIS MYRIOCARPUS Naudin. Named at Kew. Still at Bradford, and at Meanwood, Leeds, DRUCE.

†1077. MESEMBRYANTHEMUM EDULE L. Crude Bay, N. Devon, Hon. Mrs ADEANE.

1126. ANTHRISCUS SYLVESTRIS Hoffm., var. ANGUSTISECTA Druce. Ballyvaughan, Clare; Mallow, Cork, DRUCE.

1135. OENANTHE PIMPINELLOIDES L. Tellisford, Somerset, GWATKIN.

1147. ANGELICA SYLVESTRIS L., var. DECURRENS Wallr. By the Roughty River, Kerry; Roundstone, Galway; Mallow, Cork; Ballyvaughan, Co. Clare; Sligachan, Skye; Balta, Unst, DRUCE. Mull, Hebrides, TAYLOR.

†1152 (2). PEUCEDANUM GRAVEOLENS B. & H. Hertford gravel-pit, GRAVESON; Bradford, CRYER; Abingdon, Berks, GAMBIER-PARRY.

†1157. CORIANDRUM SATIVUM L. Glasson Docks, N. Lancs, Miss M. COBBE.

1182. SYMPHORICARPOS RACEMOSUS Michx. Greenhithe, Kent, DRUCE.

1194. GALIUM ERECTUM Huds. Near Brighton, Sussex, as a small neat form, Miss COTTIS; railway side near Carlisle, WEBB & DRUCE.

*1201. G. TRICORNE Stokes. Carmarthen, HAMER.

†1211. ASPERULA CILIATA Rochel. Malvern Beacon, Worcester, WALL.

1216. VALERIANA SAMBUCIFOLIA Mikan. Watton, Caithness; Syradale, Orkney, DRUCE.

*†1223. VALERIANELLA ERIOCARPA Desf. Hayling Isle, S. Hants, Miss HILLARD.

†1245. SOLIDAGO SEROTINA Ait. Sutton Courtney, Berks; Marston, Oxon, DRUCE.

1248. BELLIS PERENNIS L., lusus PROLIFERA. The Hen-and-Chicken variety. Near Badminton, Gloster, W. D. HARFORD; Devon, Mrs SANDWITH. †Var. HYBRIDA (Ten.). Leith Docks, FRASER.

†1252. ASTER TRADESCANTI A. Gray. Ref. No. 2318, between Hammersmith Bridge and Barnes, Thames-side; Ref. Nos. 2308, 2310, near Richmond, Surrey, BRITTON. Near *A. parviflorus* Nees.

†1255. A. NOVI-BELGII L. Ref. No. 2326, Thames-side above Putney, Surrey, and Ref. No. 2316 above Kew, BRITTON; Lochyside, Mid Perth, WEBB; Gwys, Brecon, WEBB.

†1255. A. FLORIBUNDUS Willd. Ref. No. 2307, Thames-side, between Richmond and Ham, Surrey, BRITTON.

†1256. A. VERSICOLOR Willd., em. Thell. Ref. No. 2309, Thames-side above Richmond, Surrey, BRITTON; Fleet Pond, Hants, MONCKTON.

1258. A. TRIPOLIUM L., var. DISCOIDEUS Reichb. Saundersfoot, Pembroke, ARNETT.

The Asters are named by Dr Thellung.

1261. ERIGERON ACRIS L., with white pappus (*serotina*). Greenhithe, Kent, DRUCE.

†1262. E. CANADENSE L. Billington, Beds, TEMPLEMAN.

1279. INULA HELENIUM L. South side of Boar's Hill, Berks, E. ALLEN; Grosmont, N.-E. Yorks, FLINTOFF.

†1284. I. VISCOSA Aiton. Barry, Glamorgan, R. SMITH.

†1294. XANTHIUM STRUMARIUM L. Hythe Quay, Colchester, BROWN.

†1306. GUIZOTIA ABYSSINICA Cass. Colchester, J. E. HUNWICKE.

1310. BIDENS TRIPARTITA L., var. MINOR W. & G. With nearly

simple leaves, Portfield, Chichester. The barbs of the fruit vary in number, LITTLE.

†1315. HEMIZONIA PUNGENS Torr. & Gray. Moulsford, Berks, Miss NEILD.

1337. DIOTIS MARITIMA Cass. Several hundreds of plants in one of the Scilly Isles, Dr H. DOWNES.

*1362 (2). MATRICARIA OCCIDENTALIS Greene. Limerick; Sligo, PRAEGER.

†1389. DORONICUM PLANTAGINEUM L. Widdington, Essex, Mrs WEDGWOOD.

1393. SENECIO AQUATICUS Hill, var. PENNATIFIDUS Gren. & Godr. Bodorgan, Anglesey, DRUCE; Carmarthen, HAMER.

*1395. S. ERUCIFOLIUS L. Llanstephan, Carmarthen, HAMER.

1400. S. SYLVATICUS L., var. AURICULATUS Meyer. Carmarthen, HAMER.

1401. S. VULGARIS L. *S. radiatus*, var. *multicaulis* Trow, with cream-coloured ligule. Cardiff, Glamorgan, Miss VACHELL.

†1402. S. CINERARIA DC. Shingle bank, west side of Pagham Harbour, W. Sussex, 1917, LITTLE.

†1411. CALENDULA ARVENSIS L. Pyrford, Surrey, Mrs WEDGWOOD.

*1418. ARCTIUM LAPPA L. Pendine, Carmarthen, KNIGHT, ex HAMER.

1420. A. NEMOROSUM Lej. Swaythling, S. Hants, RAYNER; *Llandovery, Carmarthen, KNIGHT.

1424. CARDUUS CRISPUS L., vera. Near Dorking, Surrey, MONCKTON.

1434. CIRSIUM PALUSTRE Scop., var. FEROX Druce. Ranmore

Common, Surrey, MONCKTON; near Sligachan, Skye; Strathcarron, W. Ross, DRUCE.

†1441. ONOPORDON ILLYRICUM L. St Philip's Marsh, W. Gloster, Miss I. M. ROPER.

1451. CENTAUREA PRATENSIS Thuill. Near Cirencester, Gloster, GREENWOOD.

1451. C. OBSCURA Jord. Kyle of Lochalsh, W. Ross; Sligachan, Skye; Dundee, Forfar; Cove, Kincardine; Par, Cornwall; St Albans, Herts; Mallow, Cork; Glen Flesk, Kerry; Roundstone, Galway; Cahir, Clare, DRUCE.

†1459. C. DIFFUSA Lam. Uxbridge, Middlesex, Mrs WEDGWOOD; Monk Meadow, Gloster, GAMBIER-PARRY; Glasgow, GRIERSON.

†1462. C. SOLSTITIALIS L. Hethersett, E. Norfolk, CLARKE.

†1476. CARTHAMUS LANATUS L. Radyr, Glamorgan, R. SMITH.

*1492. CREPIS MOLLIS Aschers. Nenthead, near Alston, Cumberland, WATERFALL.

1494. C. BIENNIS L. Potterne, Wilts, GWATKIN; near Abberley, Worcester, DRUCE.

†1495. C. NICAEENSIS Balb. Shalford, S. Hants, Miss TODD. The Orkney Flora plant from Kirkwall Reservoir is (teste Dr Thellung) a var. of *C. capillaris*.

†1504. LAGOSERIS NEUMAUSENSIS (Gouan) Koch. (*Pterotheca sancta* Koch). Among sainfoin, Wilbury Hill, Beds, LITTLE.

†1509. HIERACIUM PRATENSE Tausch. Near the railway, Bromsgrove, Worcester, Miss WILKINSON.

1563. H. SANGUINEUM Ley. Dalmahoy, Edinburgh, BELL; Glen Tilt, E. Perth, 1882, DRUCE.

1565. H. MURORUM L., var. SUBTENUE (W.R.L.). Glen Dole, Forfar, 1915, DRUCE.

1575. H. CREBRIDENS Dahlst. Teesdale, Durham, 1896, DRUCE; Carmarthen Van, LEY.

1584. H. SAGITTATUM Lindb., var. PHILANTHRAX Dahlst. Cane End, Oxon, 1906, DRUCE.

1584 (2). H. LINTONI Ley. Rannoch, Mid Perth, 1915, DRUCE.

1590. H. DECOLOR Ley. Moorfoot Hills, near Edinburgh, BELL.

1599. H. VULGATUM Fr., var. SUBRAVUSCULUM W. R. L. Machyntlleth, Montgomery, DRUCE.

1607. H. MACULATUM Sm. Newburgh, Fife, Miss TODD.

1609. H. SCIAPHILUM Uechtr. Bromsgrove, Worcester, WILKINSON; Benslow, Hitchin, Herts, LITTLE.

1609. H. TRANSIENS Ley. Shifnal, Salop, *Hb. Druce.*

1623. H. TRUNCATUM Lindb., forma. Near John o' Groats, Caithness, DRUCE.

1629. H. TRIDENTATUM Fr. Tiptree Heath, Essex, Mrs WEDGWOOD and BROWN; Studland, Dorset, Miss TODD.

1637. H. BOREALE Fr., var. QUERCETORUM (Jord.). Dunnet, Caithness, DRUCE. Var. DUMOSUM (Jord.). Cramond Bridge, Edinburgh, DRUCE. Var. HERVIERII (Jord.). Selham, Sussex, LITTLE; Taplow, Bucks, DRUCE.

(*Mr J. Cryer has named most of the* Hieracia.).

1640. HYPOCHAERIS RADICATA L., var. LEIOCEPHALA Regel. Shilley Green, Herts; Wallington Hall and Tottenhill, W. Norfolk, LITTLE.

1644. LEONTODON NUDICAULIS Banks, var. LASIOLENA (Bisch.) Druce. Wymondley, Herts, LITTLE.

*1645. TARAXACUM NAEVOSUM Dahlst. Erith Marshes, Kent; Pyrford, Surrey; Twinstead, N. Essex, DRUCE.

†1651. LACTUCA MURALIS Fres. Near Burntisland, Fife, naturalised, TEMPLEMAN.

1657. SONCHUS ASPER Hill, var. PUNGENS Bisch. Thorne Waste, York, Mrs WEDGWOOD.

1658. S. OLERACEUS L., var. TRIANGULARIS Dum. Pyrford, Surrey; St Neot's, Hunts; Lichfield, Staffs, DRUCE. Var. LACERUS Willd. Greenhithe, Kent; Chipping Norton, Oxon, DRUCE.

1669. PHYTEUMA SPICATUM L. Still at Abbot's Wood, Arlington, Sussex, DYMES.

*1672. CAMPANULA LATIFOLIA L. Hendrefoilan, Skirrow, Glamorgan, WEBB.

1706. RHODODENDRON PONTICUM L. Seeding in rocky places, Torrent Glen, Dolgelly, Merioneth, WEBB.

1707. PYROLA ROTUNDIFOLIA L. A form intermediate between the type and var. *maritima* was sent from black bog earth in the Broads district of E. Norfolk by W. H. ST QUINTIN. *Forma CHLORANTHIFLORA Not. Scorriclett, 7 miles west of Wick, Caithness, N.C.R., R. BAIN in *Wats. B.E.C.* 144, 1920-1.

1713. LIMONIUM VULGARE Mill, var. PYRAMIDALE Druce. Christchurch, S. Hants, Miss TODD.

1723. HOTTONIA PALUSTRIS L. Abergwili, Carmarthen, BRUNKER.

1726. PRIMULA VERIS L. With dark red corolla in a meadow at Melmerby, Cumberland, Rev. W. W. MASON.

1745. CENTUNCULUS MINIMUS L. Pembrey, Carmarthen, KNIGHT.

1758. CENTAURIUM CAPITATUM Druce. Llanstephan, Carmarthen, HAMER.

1760. GENTIANA PNEUMONANTHE L. Cropton Moor, near

Pickering, N. Yorks; first found by Miss CADBURY; flowering well, 1921, FLINTOFF.

*1763. G. AMARELLA L. Near Ystradfellte, Brecon, B. A. WILLIAMS.

1763. G. AMARELLA L., var. PRAECOX Raf. Steyning, Sussex, Miss COTTIS; Ivinghoe, Bucks, REDGROVE. I saw it there in 1898. Braunton Burrows, N. Devon, H. DOWNES. *Type on hill above Fort William, Westerness, WEBB. I have not seen the specimen.

*1765. G. CAMPESTRIS L. Near Ystradfellte, Brecon, B. A. WILLIAMS.

†1778. PHACELIA CILIATA Benth. Burton-on-Trent, Staffs, CHIPPERFIELD.

†1781. HELIOTROPIUM EUROPAEUM L. Ware, Herts, Mrs WEDGWOOD.

†1783. OMPHALODES VERNA Moench. Naturalised at Highnam, W. Gloster, GAMBIER-PARRY.

1784. CYNOGLOSSUM OFFICINALE L., var. ALBUM. Watchet, Somerset, H. DOWNES.

†1787. LAPPULA ECHINATA Gilib. Mirfield, York, T. C. TAYLOR.

†1789 (3). BENTHAMIA LYCOPSIOIDES Lindl. (AMSINCKIA). Haslemere, Surrey, TEMPERLEY.

†1789 (6). B. MENZIESII (Nels. & McBride). Newport, Countess Wear, S. Devon, D'URBAN; Headley, Surrey, REDGROVE.

†1791. SYMPHYTUM TUBEROSUM L. Thundridge, Hertford, 1848, COLEMAN; Sidley, Bexhill, Sussex, H. L. GREEN; Lerwick, Shetland, DRUCE. Doubtless adventive.

†1792. S. PEREGRINUM Ledeb. Harlech, Merioneth, DRUCE & JONES; Virley, Essex, DRUCE; Beaminster, Dorset, GRAVESON; Linkness, Orkney, DRUCE.

†1797. BORAGO ORIENTALIS L. Near a stream at Cock Mill, near Ruswarp, Yorks. First noticed by the recorders in 1916, but it is stated to have been known there for 30 years; well established, F. SNOWDON, ex FLINTOFF.

1813. MYOSOTIS PALUSTRIS Hill. Harlech, Merioneth, DRUCE & JONES. Probably of garden origin. Var. STRIGULOSA (Reichb.). Near Uyea Sound, Unst, DRUCE. This, too, may be of garden origin, although looking native.

1821. M. LUTEA Pers. Melmerby, Cumberland, Rev. W. W. MASON.

1822. LITHOSPERMUM OFFICINALE L., var. PSEUDOLATIFOLIUM Salm. Colesborne, Gloster, GREENWOOD.

†1830. CERINTHE MINOR L. Two and a half miles south of Corbridge-on-Tyne, Northumberland, on ground where trees had been felled, TEMPERLEY.

†1837. CUSCUTA EPILINUM DC. Ashwell and Newnham, Herts; Stondon, Beds, R. LONG, ex LITTLE.

†1846. SOLANIUM NIGRUM L., var. LUTEO-VIRESCENS (Gmel.). Dry Sandford, Berks, GAMBIER-PARRY.

†1849. S. TRIFLORUM Nuttall. On the sandy shore a little above high-water mark, Holy Island, Northumberland, TEMPERLEY.

†1855. DATURA STRAMONIUM L. Caldy Island, Pembroke, ARNETT; very fine at Blackpill, Glamorgan, WEBB. † Var. TATULA (L.). Meanwood, Leeds, DRUCE. The type abundant there and at Bradford.

†1860. VERBASCUM PHLOMOIDES L. Old camp ground, Swanage, Dorset, Miss TODD.

†1863. V. VIRGATUM Stokes. Denham, Bucks, REDGROVE.

†1864. V. BLATTARIA L. Felthorpe, E. Norfolk, CLARKE.

*1867. V. NIGRUM L. Carmarthen, HAMER.

†1873 (4). LINARIA DALMATICA Mill. Field near Budleigh Salterton, Devon, Alderman GARDNER.

†1882. L. SUPINA Desf. Cosham, S. Hants, 1912, Mrs WEDGWOOD.

1884. L. SPURIA Mill, lusus PELORIA. Near Bourne St Mary, Hants, BOYS.

1892. SCROPHULARIA AQUATICA L., var. APPENDICULATA Mérat. Ippolyts Common, Herts, LITTLE; Stow Wood, Oxon, DRUCE. Var. CINEREA Dum. Purwell, Hitchin, Herts, LITTLE.

1893. S. ALATA Gilib. A form with less winged stem and less glossy foliage, York, G. WEBSTER. Needs further study.

†1899. MIMULUS MOSCHATUS Dougl. Wotton, Surrey, Mrs WEDGWOOD.

*1901. LIMOSELLA AQUATICA L., var. TENUIFOLIA Lej. Sides of the River Glaslyn in both counties, Carnarvon and Merioneth, in immense quantities, GAMBIER-PARRY and D. JONES. A very important comital addition since, till now, it has only been known as a native plant from Kenfig Pool, Glamorgan.

1906 (5). VERONICA TEUCRIUM L. In a field at Knockpatrick, Limerick, PRAEGER.

1911. V. BECCABUNGA L., var. REPENS Bosch. Twinstead, N. Essex, DRUCE.

1912. V. ANAGALLIS-AQUATICA L. Swanbister, Orkney; Dunrossness, Shetland, DRUCE. Var. GLANDULOSA Druce. Oughton Head, Hitchin, Herts, LITTLE.

1912 (2). V. AQUATICA Bernh. Snove Hall, W. Norfolk, LITTLE; Bradland Pond, Northants; Swainsthorpe E. (not W.), Norfolk, DRUCE. Var. MONTIOIDES (Boiss.) Druce. Cirencester, Gloster, GREENWOOD.

1919. V. ARVENSIS L., var. NANA Poir. Near Don Bridge, Jersey, 1921, DRUCE.

†*1923. V. TOURNEFORTII Gmel. Garden weed at Unst, Shetland, DRUCE.

1940 (3). EUPHRASIA CONFUSA Pugsley. Llangannock, Carmarthen, BRUNKER.

1948. BARTSIA ODONTITES L., var. VERNA (Reichb.). Swanbister, Orkney, DRUCE; Burren, Co. Clare, DRUCE. Var. LITORALIS (Reichb.). Dunrossness, Shetland, DRUCE. New to the Mainland.

1951. RHINANTHUS MAJOR Ehrh. Near Radlett, Hertford, Dr SALISBURY.

*1953. R. RUSTICULUS (Stern.) Druce. Arisaig, Westerness; Bettyhill, W. Sutherland, 1919, DRUCE.

1954. R. STENOPHYLLUS Schur. Baltasound, Spiggie, Shetland; Roundstone, Galway, DRUCE.

*1955. R. MONTICOLA Druce. Stenness, Orkney; Balta, Shetland, 1920, DRUCE.

1959. MELAMPYRUM ARVENSE L. Eartham, W. Sussex, BROCK.

*1960. M. PRATENSE L. Saxavord, Unst, at 750 ft., only one small specimen seen in flower, DRUCE.

1962. OROBANCHE RAPUM-GENISTAE Thuill. East Hoathly, Sussex, H. L. GREEN; on gorse near Harecroft, Cumberland, Lady EDINA AINSWORTH.

1971. O. MINOR Sm., var. FLAVESCENS Reut. On *Volvulus sepium*, near Port Eynon, Glamorgan, Miss PHOEBE SIMONS.

1976. UTRICULARIA MAJOR Schmidel. Pools on the shore, Muddiford, S. Hants, Miss TODD; East Hoathly, Sussex, H. L. GREEN; Loch of Fleet, new to Unst, DRUCE.

†1983. ACANTHUS MOLLIS L. Mule camp, on the downs, near Shoreham, Sussex, Miss COTTIS.

†1989. MENTHA ALOPECUROIDES Hull. Binstead, Isle of Wight, Mrs WEDGWOOD.

1990. M. LONGIFOLIA Huds. Near Basset, S. Hants, Miss TODD.

1996. × M. VERTICILLATA L., var. PALUDOSA (Sole). Shawford, S. Hants, RAYNER.

1997. × M. GENTILIS L. Swaythling, S. Hants, garden plant, RAYNER; Mallow, Co. Cork, 1921; Birdlip, Gloster, DRUCE; Felinfoel, Carmarthen, *Motley Hb.*

2000. M. ARVENSIS L., var. NUMMULARIIFOLIA (Sch. & Korte). Denham, Bucks, DRUCE; Harefield, Middlesex, DRUCE.

2004. ORIGANUM VULGARE L., var. ALBIFLORUM Lej. Gower, Glamorgan, WEBB.

†2031. SALVIA VERTICILLATA L. Radyr, Glamorgan, R. SMITH; Dunster, Somerset, G. TALBOT; Glasson Docks, Lancs, Miss M. COBBE.

2044. PRUNELLA VULGARIS L., sub-var. ALBA. An albino plant, with type, at Lowthorne, E. Yorks. An immense colony in newly cleared woodland, W. CRAIK.

†2059. STACHYS ANNUA L. Radyr, Glamorgan, R. SMITH.

2075. LAMIUM GALEOBDOLON Cr. Peloric form, Leigh Woods, N. Somerset, N. SANDWITH.

2082. TEUCRIUM CHAMAEDRYS L. In a lane near Penzance, Cornwall, THURSTON.

2083. AJUGA REPTANS L. A scionless form on Carnedd Dafydd, Carnarvon, June 1921. Perhaps Johnson's plant (see *Merc. Bot.*, pars alt. ii., 1641) was this form, DRUCE.

2090. PLANTAGO CORONOPUS L., var. PYGMAEA Lange. Merthyr-Mawr dunes, Glamorgan, WEBB.

2092. P. LANCEOLATA L. With dense, compound heads at Hayling Island, S. Hants, Miss HILLARD; Godshill, Isle of Wight, STRATTON. Var. DECUMBENS Rostr. Roundstone, Galway, DRUCE. Var. SPHAEROSTACHYA Roehl. With considerable wool at leaf-bases [Ref. No. 1879], East Mersea, Essex, BROWN.

†2100. P. ARISTATA Mich. N. Queensferry, Fife, TEMPLEMAN.

2102. ILLECEBRUM VERTICILLATUM L. Mouth of the River Meon, S. Hants, Miss HILLARD.

†2110. AMARANTHUS RETROFLEXUS L., var. DELILEI Thell. Hertford, 1846, ANSELL.

2120. CHENOPODIUM HYBRIDUM L. Winchester, Miss TODD.

2121. C. URBICUM L. Bradford, Yorks, CRYER; Berwick, A. H. EVANS.

2122. C. MURALE L., var. MICROPHYLLUM Gurke. Exmouth, S. Devon, Miss TODD; Hertford, GRAVESON.

2123. C. OPULIFOLIUM Schrad. Radyr, Glamorgan, SMITH; Gloucester Docks, GAMBIER-PARRY. C. OPULIFOLIUM × ALBUM = × C. PREISMANNI Murr. Cirencester, Gloster, W. J. GREENWOOD.

2124. C. LANCEOLATIFORME Murr. A conspicuous, tall plant with entire, lanceolate leaves, Bradford, Yorks, September 1921, and a form with long, mucronate leaves at Botley, Oxon, DRUCE.

2124. C. VIRIDE × ALBUM. With subfastigiate inflorescence [Ref. No. Y896], Bradford, Yorks, DRUCE.

2124. C. PAUCIDENS Murr (*album* × *viride*). E. Bergholt, Suffolk [Ref. No. 1777], BROWN; Bradford, Yorks [Ref. No. Y986), September 1921, DRUCE; Swanage, Dorset, C. B. GREEN; Glasgow, 1921, GRIERSON; Radyr, Glamorgan, SMITH.

2124. C. SUBFICIFOLIUM Murr, as a sub-sp. of *album*. Swanage, Dorset, C. B. GREEN; Bradford, Yorks, CRYER. Dr Murr thus names the plant and cancels the var. *borbasiforme* to which I referred it.

2124. C. PSEUDO-STRIATUM Zschacke. Bradford, Yorks, September 1921, CRYER & DRUCE.

2124 (5). C. LANCEOLATUM Muhl. Bradford, Yorks, September 1921, CRYER & DRUCE.

2125. C. LEPTOPHYLLUM Nutt. Barry, Glamorgan, SMITH.

2126. C. FICIFOLIUM Sm. Hitchin, Herts, LITTLE. This corroborates the name in *Rep. B.E.C.* 158, 1914.

2127. C. GLAUCUM L. In a field at Falconhurst, Edenbridge, Kent, G. TALBOT. A curious, untypical form, thus named by Dr Murr. Also from Sowley Pond, S. Hants, Miss TODD.

2129. C. POLYSPERMUM L. Grovebury sandpit, near Billington Crossing, Beds, 1920, A. TEMPLEMAN. A very dwarf form. Var. CYMOSUM Moq. North Cadby, Somerset, BOYS.

†2130. C. AMBROSIOIDES L. Bradford, Yorks, CRYER & DRUCE.

†2130 (3). C. PANICULATUM Hook. Bradford, Yorks, 1919, CRYER. Dr Murr corroborates Dr Thellung in thus naming it.

†2131. C. STRIATUM (Kras) Murr, f. EROSA. With very compact inflorescence, Baptist Mills, Bristol, October 1920, Miss TODD.

†2131. C. SUBSTRIATUM Murr = C. STRIATUM × ALBUM, ad PRAEACUTUM vergens. Another conspicuous Goosefoot, growing at Bradford, Yorks, September 1921, DRUCE & CRYER; Abingdon, Berks, 1917, DRUCE.

†2131 (3). C. HIRCINUM Schrad. Bradford, Yorks, CRYER & DRUCE; Leith, FRASER.

†2131 (4). C. BERLANDIERII Moq. Hythe Quay, N. Essex [Ref. No. 177], BROWN. Near to this is a plant from Winchester, Miss TODD.

†2134. C. VIRGATUM Ambrosi. Cambridge, H. CARTER; Phillach sand dunes, Cornwall, E. THURSTON.

†2135. ROUBIEVA MULTIFIDA Moq. Radyr, Glamorgan, SMITH; Uxbridge, Middlesex, Mrs WEDGWOOD.

2148. ATRIPLEX DELTOIDEA Bab. Compton, Beds, LITTLE.

†2153 (2). AXYRIS AMARANTOIDES L. Reigate, Surrey, H. E. GIRDLESTONE; Scarborough, Yorks, A. H. ALSTON.

*2157. SALICORNIA LIGNOSA Woods. Near Cardiff, Glamorgan, Miss VACHELL.

2176. POLYGONUM TOMENTOSUM Schrank (*maculatum*). *Burridge Health Farm, Gt Bedwyn, S. Wilts, C. P. HURST; Fordham, W. Norfolk, LITTLE; Llanarthney, Carmarthen, HAMER.

*2178. P. MITE Schrank. Pembrey, Carmarthen, HAMER.

†2190 (2). P. POLYSTACHIUM Wall. Cocklington, S. Devon, Miss TODD.

†2191. P. CUSPIDATUM S. & Z. Bexhill, &c., Sussex; Fulham, Middlesex, GREEN; Fort William, Westerness, WEBB.

2195. RUMEX HYDROLAPATHIUM Huds., var. LATIFOLIUS (Borr.). Near Wareham, Dorset, Miss TODD; Welshpool, Montgomery, DRUCE. A plant from Chew Magna collected by Mrs THATCHER is perhaps best placed here.

×2198. R. PROPINQUUS Aresch. Langdon Beck, Teesdale, Miss M. COBBE.

2207. R. MARITIMUS L. Highnam, W. Gloster, GAMBIER-PARRY; Cirencester, Gloster, GREENWOOD; Scoulton, Norfolk, Miss COBBE.

†2210 (6). R. SALICIFOLIUS Weinm. Chipping Norton, Oxon, DRUCE; Slateford, Midlothian, FRASER; Uxbridge, Middlesex, Lady DAVY.

†2210 (12). R. MAGELLANICUS Gris. Seen at Leith for nearly 20 years, FRASER; Phillack sand dunes, Cornwall, near a mule camp, THURSTON.

*2214. DAPHNE LAUREOLA L. Near St Peter's, Guernsey, on a high wall with earth, not planted, W. H. JONES.

2215. D. MEZEREUM L. Still at Kettlewell, Yorks, Miss COBBE.

2223. EUPHORBIA PLATYPHYLLOS L. Stone, Kent, ST J. MARRIOTT.

*2227. E. AMYGDALOIDES L. Wood, near Ystradfellte, Brecon, B. A. WILLIAMS.

2243. MERCURIALIS AMBIGUA L. f. Near Winchester, Miss TODD.

2246. ULMUS PLOTII Druce. Shrewsbury, Shropshire; Tewkesbury, W. Gloster; Mallow, Cork, DRUCE.

†2248. CANNABIS SATIVA L. Near Leicester, 10 feet high, in an orchard, MARTIN.

2258. ALNUS GLUTINOSA Gaertn., var. MACROCARPA Loudon. Ballyhalis, Kerry, DRUCE; the type near Hitchin, Herts, less common than var. *macrocarpa*, LITTLE.

2259. CARPINUS BETULA L. In a hedge near Great Horwood, Bucks, F. W. HEWLETT.

†2264. QUERCUS ILEX L. Seedlings on Caswell Cliffs, Glamorgan, WEBB.

2270. SALIX HOFFMANNIANA Sm. ♀ Plentiful at Shalbourne, S. Wilts, and one tree ♀ at Great Bedwyn, N. Wilts, HURST.

× 2273. S. ACUMINATA Sm. Ickleford, Herts, LITTLE.

2289. POPULUS CANESCENS Sm. Near Welshpool, Montgomery, DRUCE.

†2291. P. NIGRA L. Ludlow, Salop; Welshpool, Montgomery, DRUCE.

2299. HYDROCHARIS MORSUS-RANAE L. Pond at Redcoats Green, Herts, perhaps introduced by water birds, LITTLE.

2306. LISTERA CORDATA Br. Teesdale, Durham, Miss M. COBBE.

*2309. SPIRANTHES ROMANZOFFIANA Cham. In a bog near Waterville, Kerry, P. MACSWEENEY in *Irish Nat.* 79, 1921. R. W. Scully suggests that the south and north Irish plants differ slightly.

*2313. CEPHALANTHERA DAMASONIUM Druce. Beech wood on chalk near Brough, E. Yorks, 1920-21, Miss BURNETT, ex W. S. BISAT and J. FRASER ROBINSON. An important extension of its range northwards.

2323. ORCHIS USTULATA L. Pointon, near Billingbro, Lincoln, Miss LANDON.

2324. O. MORIO L., forma CHURCHILLII Druce. Ramsden Heath; Stanton St John, Oxford, DRUCE; Cuckfield, Sussex, Lady DAVY.

2325. O. LATIFOLIA L. Professor LINDMAN kindly sent me specimens from wet meadows, Scania, Sweden, which resemble the Swiss plants from Aarau, Switzerland, supplied by Dr Keller. They differ from any British plant yet seen by me. The "*latifolia*" from Arran sent by Dr Stephenson is a slender plant with narrow leaves, and to me is a *maculata* hybrid.

2326. O. INCARNATA L. Christchurch, S. Hants, R. V. SHERRIN. Var. DUNENSIS Druce. Marshy loch side, Kierfold, Sandwick, Orkney, 1921, JOHNSTON. Seen in Orkney in 1920, DRUCE.

2326 (2). O. PRAETERMISSA Druce. Woodbury Common, Halberton, Tiverton, S. Devon, robust plants over 2 feet high, D'URBAN; Cirencester, Gloster, GREENWOOD; typical, Cobham, Surrey, L. G. PAYNE; Harlech, Merioneth; *Sligachan, Skye; *Strath Carron, W. Ross; *Blair Athol, E. Perth; *Lerwick, Shetland, DRUCE. Var. PULCHELLA Druce. Stoborough, Miss I. M. ROPER; Wareham, Dorset, R. V. SHERRIN; Arran, STEPHENSON; Teesdale, Durham; Walton, Caithness; Inchnadamph, W. Sutherland; Invershin, E. Sutherland; Sligachan, Skye; Strathpeffer, E. Ross; Balta, Burrafirth, Unst; Tingwall, Whiteness, Dunrossness, Shetland; Woodford, Galway, DRUCE. × MACULATA. Harlech, Merioneth, DRUCE. × FUCHSII. Near Cobham, Surrey, L. G. PAYNE; Sligachan, Skye, DRUCE.

2326 (3). O. PURPURELLA Steph. Kirkby, 69b, PEARSALL; *Kirbister, Syradale, Orkney; *Lerwick, Balta, Shetland; *Strathpeffer, E. Ross; Llanganeth, Glamorgan; Tremadoc, Carnarvon; Watendlath, Cumberland, DRUCE; Keirfold, Orkney, 1921, Ref. No. 1147, JOHNSTON; Arran, STEPHENSON. × LATIFOLIA. Arran, STEPHENSON. × HABENARIA GYMNADENIA. Arran, STEPHENSON.

2327. O. MACULATA L., var. MACROGLOSSA Druce. Harlech, Merioneth, DRUCE. × PRAETERMISSA, var. PULCHELLA. Syradale, Kirbister, Orkney, 1920; Tingwall, Spiggie, Shetland, DRUCE. × HABENARIA GYMNADENIA. Arran, STEPHENSON; forest of Rowland, York, J. A. PICKARD.

2327 (2). O. FUCHSII Druce. Cobham, Surrey, L. G. PAYNE; Woodbury Common, S. Devon, thirty inches high, D'URBAN. × MACULATA = O. TRANSIENS Druce. Cobham, Surrey, L. G. Payne.

2327 (3). O. O'KELLYI Druce. Ditchling, Sussex, L. G. PAYNE; Glenasmole, Dublin, PRAEGER.

2329. O. MASCULA L. Near Tenby, Pembroke, and near Malvern, Worcester, TOWNDROW & WALL; leaves unspotted, labellum less cut, flower deep colour, Cwm Idwal, Carnarvon, DALTRY.

*2331. O. HIRCINA Crantz. Near Lollingdon, Berks, Misses STEPHENS and WELLS, ex Miss NEILD; Hinxton, Cambridge, A. SHRUBBE, ex A. H. EVANS. Splendid new county records. *Hircina* flowered well in Jersey, Kent, Gloster, and Sussex this year.

2335. OPHRYS APIFERA Huds., var. CHLORANTHA Heer. Eastbourne, Sussex, HAYNES.

2335 (2). O. TROLLII Heget. Andoversford, Mr HEMPIDGE, ex Miss VACHELL; Highnam, Gloster, GAMBIER-PARRY.

*2336. O. MUSCIFERA Huds. Killiecrankie Pass, E. Perth, J. PICKARD.

2343. HABENARIA VIRESCENS Druce, var. ECALCARATA. Wittenham Wood, Berks, HAYNES.

†2363 (2). TRITONIA CROCOSMIFLORA Nich. **On rubbish, Chipping Norton, Oxon;** by the Roughty River near Dromidnagower, Kerry, far from houses, September 1921, DRUCE; Blackpill, etc., Glamorgan; Arisaig, Westerness, WEBB; shores of the Clyde at Whiting Bay, Tighnabruaich, GRIERSON.

2364. NARCISSUS LOBULARIS Haworth. Mr J. ARNETT sent me fresh specimens on March 2, 1921, from the vicinity of Tenby, Pembroke, of the single and also the flore pleno variety.

*2382. RUSCUS ACULEATUS L. Near Carmarthen, HAMER.

†2390. ASPHODELUS FISTULOSUS L. Portishead Dock, N. Somerset, GAMBIER-PARRY; Eltham, Kent, Mrs WEDGWOOD; Glasson, Lancs; Exmouth, Devon, Miss A. B. COBBE.

2396. ALLIUM VINEALE L., var. BULBIFERUM Syme. Bexhill, Sussex, H. L. GREEN. Var. COMPACTUM (Thuill.). The only form about Hitchin, Herts, LITTLE.

†*2405. A. SCHOENOPRASUM L. Hayling Island, S. Hants, Miss HILLARD.

2410. SCILLA AUTUMNALIS Huds. In thousands this year near Hampton Court, Lady DAVY; on Blackheath, Kent, 1920, Miss BACON. It is very pleasing to find this much threatened species still growing in the vicinity of the metropolis.

2411. S. NONSCRIPTA L. & H., var. BRACTEATA Druce. Midsomer Norton, Somerset, Mrs TUNNICLIFF, ex Mrs THATCHER.

2420. GAGEA LUTEA Ker-Gawl. At 1125 feet in Colt Park Wood, Ribblehead, York, C. A. CHEETHAM in *Naturalist* 168, 1921.

2422. COLCHICUM AUTUMNALE L., var. VERNALE. Silligrove, Wyre Forest, Worcester, Miss M. AMOS, ex H. POWELL.

2425. PARIS QUADRIFOLIA L. A six-leaved form at Coedriglan, Glamorgan, R. SMITH.

2434. JUNCUS SYLVATICUS Reich. Attacked with the gall, *Livia juncorum*, Killin, M. Perth, FRASER.

2441. J. TENUIS Willd. Ardlui, Dumbarton, *Glasgow Nat.* 103, 1915. There is a Perthshire specimen collected by M'Intyre before 1844 in *Herb. Ansell.*

*2466. SPARGANIUM MINIMUM Fr. Llanaber, Merioneth, DRUCE.

*2478. ELISMA NATANS Buch. Cwm Bychan Lake, Merioneth, GAMBIER-PARRY.

2528. CYPERUS FUSCUS L. It has re-appeared at Dorney, Bucks, in small quantity, DRUCE and Miss BARBARA BUCKLER; most abundant this year near Clevedon, N. Somerset, Mrs SANDWITH.

2530. ELEOCHARIS MULTICAULIS Sm. Sligachan, Skye, DRUCE.

*2531. E. ACICULARIS Br. Welshpool, Montgomery, DRUCE.

*2540. SCIRPUS NANUS Spreng. On the banks of the Glaslyn River, Merioneth, DRUCE, JONES, & GAMBIER-PARRY. In considerable quantity, Mr Parry says, with *Eleocharis acicularis*, *Scirpus setaceus* and *Savii*.

2549. ERIOPHORUM GRACILE Roth. Aldershot, Hants, TEMPLEMAN.

2558. CAREX PSEUDOCYPERUS L. Near Welbeck, Notts, GOULDING; *Singleton Bog, Glamorgan, WEBB.

*2559. C. RIPARIA Cust. Carmarthen, BARKER.

2576. C. FLAVA L., var. OEDOCARPA And. Llanaber, Merioneth, DRUCE.

2576. C. LEPIDOCARPA Tausch. Hoy, Orkney, DRUCE. × FULVA. Simonsbath, S. Somerset, Lady DAVY; above Tan-y-Bwlch, Carnarvon, Miss COBBE.

2604. C. GOODENOWII Gay, var. RECTA A. & G. Llanaber, Merioneth, DRUCE.

*2617. C. PANICULATA L. Llanaber, Merioneth, DRUCE; Pamplin

also saw it near Llanderfel. Var. PSEUDO-PARADOXA Gibs. Oughton Head, Hitchin, Herts, LITTLE.

2621. C. INCURVA Lightf. Near Spiggie, Shetland, DRUCE.

2627. C. PAUCIFLORA Lightf. Eskdale, Cumberland, an extension of its range in the county, and its second locality 40 miles apart, R. H. WILLIAMSON.

†2634. PANICUM SANGUINALE L. Grange-over-Sands, Lancs, Miss A. B. COBBE.

†2637. P. LAEVIFOLIUM Hack. Maryborough Camp, Glasgow, GRIERSON; Bradford, York, CRYER, as the var. *amboense* Hackel.

†2650. PHALARIS AQUATICA L. Bowling Coup, Glasgow, GRIERSON.

*2670. MILIUM EFFUSUM L. Porth-yr-Ogof, Brecon, WEBB.

2678. PHLEUM ARENARIUM L. Gloucester Dock, GAMBIER-PARRY.

*2706. AIRA CARYOPHYLLEA L. On shale cliff near Scalloway, Shetland, native. Beeby only saw a solitary specimen in cultivated ground, DRUCE. Var. MULTICULMIS (Dum.). Benston, Herts, LITTLE.

2717. AVENA FATUA L., var. PILOSISSIMA Gray. Mr Marquand, who has been specialising on Oats, has kindly examined my Herbarium. The following localities have afforded specimens which he puts under Gray's variety. St Luke's, Jersey; Falmouth, Cornwall; Staplehurst, Kent (E. S. MARSHALL); Claygate, Surrey (H. C. WATSON); Yiewsley, Middlesex; Bengoe, Herts, 1853 (ANSELL); Amersham, Slough, Bucks; Hermitage, &c., Berks; Bullingdon, Banbury, &c., Oxon; Warboys, Cambridge (FRYER); Pilning (J. W. WHITE); St Philip's Marsh, W. Gloster; Lighthorne, Warwick, 1855 (C. E. PALMER); Portmadoc, Carnarvon; Watton, Norfolk; Yardley Gobion, Harp le, &c., Northants; Chesterfield, Derby (DRABBLE). Var. GLABRATA (Peterm.). Staines, Harefield, Middlesex; Wytham, Berks; Slough, Bucks; Galashiels, Selkirk.

†2721. A. ORIENTALIS Schreber. Odiham, Hants, 1889, Miss C. E. PALMER.

2733. PHRAGMITES VULGARIS (Lam.) Druce, var. STOLONIFERA (Mey.). Lyme Regis, Dorset, Miss A. B. COBBE. Var. FLAVESCENS (Cust.). Erith, Kent; Mallow, Cork; Limerick; Killarney, Kerry; Wexford, DRUCE. Var. EFFUSA (A. & G.). Radley, Berks; Greenhithe, Kent, DRUCE.

*2746. CATABROSA AQUATICA Beauv. Carmarthen, BARKER.

2759. POA PRATENSIS L., var. LATIFOLIA Weihe. Hoy, Orkney, 1920; Marlborough, Wilts, a very robust plant, DRUCE. Var. ANGUSTIFOLIA (L.). Chichester, Sussex, DRUCE.

*2759 (2). P. IRRIGATA Lindm. Burrafirth, Unst, Shetland, DRUCE.

†2760. P. PALUSTRIS L. Uxbridge, Middlesex, Lady DAVY. Adventive here as elsewhere in Britain.

2761. P. TRIVIALIS L., var. RIGIDIOR Rupr. Winter Corrie, Clova, Forfar, DRUCE. Var. GLABRA Doell. Stone Marshes, Kent, ST J. MARRIOTT.

*2773. GLYCERIA PLICATA Fr. Welshpool, Montgomery, DRUCE.

2783. FESTUCA SYLVATICA Vill. Below Einon Gam Fall, Glamorgan, WEBB. Spec. non vidi.

†2803. BROMUS UNIOLOIDES H.B.K. Gloster Docks, GAMBIER-PARRY; Swaythling, S. Hants, RAYNER; Hayes, Kent, Mrs WEDGWOOD.

†2806. B. SECALINUS L. The short spikeletted form. Between Wareham and Wool, Dorset, Miss TODD; Glasgow, GRIERSON.

*2807. B. COMMUTATUS Schrad. Llanelly, Carmarthen, *Hb. Motley*.

†2815. B. MACROSTACHYS Desf. Woolwich, Kent, C. H. GRINLING.

†2817. B. JAPONICUS Thunb. Hampstead, Middlesex, Mrs WEDGWOOD.

2824. LOLIUM PERENNE L., var. SPHAEROSTACHYUM Masters. Aberystwyth, Cardigan, MARQUAND.

2827. AGROPYRON REPENS × JUNCEUM (*A. Hackelii* Druce). Muddiford, S. Hants, Miss TODD.

*2872. EQUISETUM HYEMALE L. Fairlight Glen, Sussex, 1914, REDGROVE. A very interesting record.

2896. DRYOPTERIS REMOTA Braun. A single clump in the wood, Dalystone, Galway, PRAEGER. One would value Mr Stansfeld's opinion on this.

2898. D. SPINULOSA Kuntze. Oughton Head, Herts, LITTLE.

2899. D. ARISTATA Druce, var. ALPINA (Moore). Scuir Ouran, W. Ross, 1883; Cairngorm, Easterness, 1920, DRUCE.

2911. CETERACH OFFICINARUM DC., var. CRENATUM Milde. Llangendeirne, Carmarthen, BARKER.

†2923. AZOLLA FILICULOIDES Lam. Monkton, Kent, Lady DAVY and Miss VIVIAN.

*2936. NITELLA TRANSLUCENS Ag. Bardister, Shetland, DRUCE.

*2943 (2). TOLYPELLA NIDIFICA Leonh. Loch of Huesbreck, Shetland, DRUCE.

*2950. CHARA CONTRARIA Br. With the foregoing, DRUCE.

2958 (2). C. DELICATULA Gr. & Webst. Wareham, Dorset, Miss TODD; Roundstone, Galway; Sligachan, Skye, DRUCE.

ADVENTIVE PLANTS OF THE GLASGOW AREA, 1921.

In the Counties of Renfrew (R.), Lanark (L.), and Dumbarton (D.).

By R. Grierson.

224. *Brassica incana* Schultz, Riddings (L.). 239. *Lepidium perfoliatum* L., Maryburgh (L.), Cumbernauld (D.). 247 (4). *L. densiflorum* Schrad. 247 (31). *L. ramosissimum* A. Nels. 268. *Rapistrum rugosum* All., Riddings (L.), Newlands (L.), Dumbarton. 324. *Dianthus Caryophyllus* L., hortal, Tollcross (L.). 328. *Gypsophila paniculata* L., Maryburgh (L.). 330 (2). *G. elegans* Bieb. 356. *Silene annulata* Fenzl, Riddings (L.). 562. *Medicago Falcata* L., Gartcosh (L.). 610. *Trifolium stellatum* L., Dalmuir (D.). 651. *Galega officinalis* L., Bowling (D.). 685. *Vicia monanthos* Desf., Bowling (D.). 727. *Lathyrus odoratus* L., hortal, Tollcross (L.). 1107 (2). *Carum aromaticum* Druce (*copticum*), Maryburgh (L.). 1297. *Rudbeckia laciniata* L., Newlands (L.). 1301. *Helianthus annuus* L. 1306. *Guizotia abyssinica* Cass., Ibrox, etc. (L.). 1313. *Hemizonia pungens* T. & G., Possil (L.), Maryburgh (L.), Dalmuir (D.). 1338. *Anthemis tinctoria* L., Maryburgh (L.). 1489. *Picris Hieracioides* L., Ibrox (L.). 1777 (6). *Nemophila insignis* Benth., Maryburgh (L.). 1878. *Linaria repens* Mill., Gartcosh (L.). 1879. *L. chalepensis* Mill., var. *cleistogama* (Thell.), (L.). 2135. *Monolepis trifida* Schrad., Maryburgh (L.). 2168. *Salsola Kali* L., var. *tenuifolia* (Mey.), Possil (L.). 2114 (2). *Amaranthus Dinteri* Schinz, var. *uncinatus* Thell., Bowling (D.). 2111 (4). *A. quitense* H. B. K. 2210 (13). *Rumex paraguayensis* Par., Possil (L.). 2632. *Panicum Crus-galli* L., var. *longiaristatum* Lej., Newlands (L.). 2636. *P. miliaceum* L., Newlands (L.). 2640. *Setaria glauca* Beauv., Bowling (D.), Newlands (L.). 2649. *Phalaris tuberosa* L., Bowling (D.). 2650 (2). *P. truncata* Guss., Bowling (D.). 2698. *Gastridium ventricosum* S. & T., Ibrox (L.). 2718 (2). *Avena sterilis* L., Dalmuir (D.). 2792. *Festuca Myuros* L., Ibrox (L.). 2794. *Bromus villosus* Forsk. = *B. rigens* L. 2854 (2). *Hordeum trifurcatum* Jacq., Ibrox (L.).

ADVENTIVE PLANTS OF THE DUBLIN AREA, 1921.

By R. Grierson.

224. *Brassica incana* Schultz. 228. *Eruca sativa* Mill. 267. *Rapistrum orientale* DC. 1357. *Chrysanthemum coronarium* L. 1462. *Centaurea Solstitialis* L., Ballsbridge. 1463. *C. melitensis* L. 1789 (3). *Benthamia* (*Amsinckia*) *lycopsioides* Lindl. 1789 (5). *B. intermedia* Druce. 2639. *Setaria viridis* Beauv. 2640. *S. glauca* Beauv. 2803. *Bromus unioloides* H.B.K.

BRITISH CENTAUREAS OF THE NIGRA GROUP.

By C. E. Britton.

The following represents an attempt at an arrangement of the chief plant forms that pass in Britain under the name of *Centaurea nigra*. All botanists who have interested themselves in these plants are well acquainted with the diversity of forms met with, and of the difficulty that exists in assessing the correct value of the variations encountered. What has chiefly appealed to observers are the variations exhibited by (1) the phyllary-appendages, (2) the florets, (3) the fruits; other parts of the plants receiving less attention.

The *phyllary-appendages*.—In all members of the *nigra* series the appendages should be deeply pectinated with long more or less regularly-shaped teeth, equalling the disk-like undivided portion, or more usually exceeding the diameter of this in varying degrees to as much as four or five times. It is when the teeth bear a smaller relation to the disk, are less filiform, and variously united, that there may be a disposition to connect the plants showing such divergences with plant-forms outside the series of *nigra*.

The *florets*.—Usually these are uniform in the group of *nigra*, whereas in most species of the genus *Centaurea* it is the rule for the outer series to be much enlarged, of a shape different from the inner florets, and to collectively form a showy "ray."

The *fruits*.—Normally these are surmounted by a bristly or scale-like pappus. Frequently, however, no pappus is developed

and when this condition is accompanied by one or both of the variations of the appendages and florets alluded to, such forms have been referred to *C. nigrescens* Willd., *C. serotina* Bor., *C. decipiens* Thuill., and *C. pratensis* Thuill., their real relationship being overlooked.

In general, I think it will be recognised that variation among the plants of this group is greater in Britain than on the Continent. With respect to the rayed forms which appear to be always rare on the Continent, these are singularly ill-distributed in this country, being in some localities of extreme rarity, in others so abundant as to constitute dominant forms. The property of producing radiant marginal florets seems inherent in the genus and is, no doubt, a latent character in the group of *nigra*, being called into existence by local conditions of exposure, elevation, &c. Some authors place great value upon the presence of radiant florets and absence of pappus, but, in the present group, these features appear to the writer to be of the nature of biological characters of little taxonomic importance, for in plants otherwise identical the florets may be radiant or not, and the fruits devoid of pappus or provided in varying degrees with this latter. It is quite certain, as experience in the field shows, that the arrangement adopted by Mr F. N. Williams (*Prodr. Fl. Brit.* i., 57-60), which would refer to *C. nigra* the pappose-fruited forms, and to *C. Jacea* those deficient of pappus, is hardly in accordance with the facts.

CENTAUREA NIGRA L.

Whether it is possible to use this name other than in an aggregate sense is doubtful. When looking through the Linnean Herbarium no type specimen was seen: all that bore on the matter was a specimen, without data of any kind, that Dr Daydon Jackson informed me was grown in the garden at Upsala as the Linnean species. The opinion of Jordan that the name covered many different plants is probably correct and is here adopted, although it must be admitted that later French botanists regard *C. nigra* L. as synonymous with *C. obscura* Jord.

C. OBSCURA Jord. in Schultz Arch. Fl. Fr. et D'Allemagne, p. 320.

It is rather curious that the author of the name, contrary to his usual practice, published no long and detailed description.

After discussing the question of the applicability of the Linnean name, and arriving at the conclusion before-mentioned, Jordan stated that he applied the name *C. obscura* to the species formerly named by him *C. nigra*, and particularised it in the following words: "C'est une plante de prairies montueses, plus basse et moins multiflore que le *C. nemoralis* Jord., à capitules plus gros, à involucres plus noirâtres, fleurissant dans un même lieu, près de deux mois avant cette dernière espèce qui habite surtout les bois de la plaine." The importance attached to the habit and season of flowering is well-founded, as contrasted with *C. nemoralis*, and inspection of plants distributed by Jordan as his *obscura* show a close agreement with the short description. These plants have usually unlobed lanceolate leaves, stems simple or with few undivided branches with terminal globose capituli, appendages dark brownish-black, with the central disk triangular-lanceolate or even lanceolate. Some authors ascribe to the appendages a broader outline than the type-specimens allow; for instance, Boreau described them as very broadly ovate; Grenier (*Fl. Jurass.*) said that they were much broader than long; whilst Gugler described the disk as broadly-ovate to roundish or even reniform. It is quite certain that *C. obscura*, as defined by Jordan and exemplified by his authentic specimens, is by no means a rare plant in Britain, occurring from the south to the extreme north (*C. nigra* L. from Sand Voe, Shetlands, 4/7/1889, W. H. Beeby, in Herb. S. Lond. Bot. Inst., appears to be undeveloped *C. obscura*). Just as on the Continent, it is difficult at times to draw a rigid line separating *C. obscura* from *C. nemoralis*, so similar uncertainties are occasionally presented by British plants, but bearing in mind the habit, the branches few and usually short, the roundish, usually dark-coloured heads, the early season (June) at which it commences to flower, there should be no difficulty in its recognition. British forms which cannot be kept apart from *C. obscura* may be as tall and as much branched as the most luxuriant form of *C. nemoralis*; the capituli may range in colour through all shades of brown to black; the appendages may be closely appressed or more or less spreading, and the pectination may be coarse. Among others, the following forms appear worthy of recognition.

Forma *longiflora*.—Florets much exserted, equalling the length

of the pericline, the outer bent at right angles, sometimes doubly curved, about 28 mm. long; stamens of outer florets devoid of anthers; style and stigma well-developed; fruit epappose. This when growing is a plant with very conspicuous, bright crimson-purple florets which are pseudo-radiate, or sub-radiate, and has frequently attracted the attention of collectors. It is apparently referred to by Syme in *English Botany* v., 32, where he notes "another form has all the florets elongated or several rows of them elongated, but is destitute of the elongated trumpet-shaped ray." Surrey, Middlesex (cultivated examples distributed Bot. Exch. Club, 1921, under Ref. No. 1822), etc.

Forma *radiata*.—Outer florets radiate. This appears to be less frequent than the analogous form of *C. nemoralis*. Specimens placed here were distributed by Mr R. S. Standen from Burley Street, New Forest, Hants, 1913, through the Watson. Exch. Club, and by Rev. W. R. Linton from Cwm Bychan, Merioneth, 1895, through the Bot. Exch. Club. Specimens have also been seen from Devon, Aberdeen, etc.

Forma *pinnatifida*. — Leaves oblong-lanceolate, obtuse or acuminate-pinnatifid; lobes prominent, broadly triangular, or at lowest part of lamina lanceolate-acuminate. Has the habit of *C. obscura*, the stem with two or three branches each bearing a solitary capitulum. Surrey—Headley. Edinburgh—Pentland Hills, 1921 (Miss I. M. Roper).

Forma *elongata*.—Stem branched from or below the middle, lower branches 20-30 cm. long or more, often exceeding the main stem, simple or again branched. Stem-leaves lanceolate or oblong, entire or somewhat pinnatifid; rameal-leaves linear-lanceolate, entire or serrate-pinnatifid. Sometimes form luxuriant, much-branched plants about 3 feet high. Surrey, in several localities. Forfarshire (G. C. Druce), etc.

Var. *subnemoralis*, var. nov.—Stem reaching 7-8 dm., leafy, branched above; branches erect, the lower elongated. Stem-leaves linear-oblanceolate, entire or shallowly dentate-serrate, or oblong-oblanceolate, sinuate-pinnatifid. Capituli globose, umbilicate at base; appendages blackish-brown or black (teeth brownish), closely imbricate, or spaced, and then allowing the green phyllaries to be visible, spreading or spreading-recurved at lower part of

capitulum; disks of lowest series subulate or narrowly lanceolate, succeeding series lanceolate-triangular to deltoid, uppermost roundish. Distinguished by narrow elongated leaves (lowest about 14 × 2.5 cm.) and narrow spreading or recurved basal appendages. Radnor—rocky banks of R. Wye at Boughrood (W. C. Barton) [Ref. No. 478], distributed through Bot. Exch. Club 1920). Surrey—Ockham (cultivated plants distributed under No. 2209 through Bot. Exch. Club 1921).

Forma *longiflora*.—Florets as in *C. obscura*, f. *longiflora*. S. Lincs.—Bourne (A. Webster).

CENTAUREA SURREJANA, sp. nov.

Stem erect, flexuose, simple or more usually branched; leaves scattered, subequal, the lower 10-16 cm. long, oblanceolate or elliptical-lanceolate, sinuate-pinnatifid or dentate, subacute, narrowed into petiole sometimes as long as lamina; the upper leaves oblong-lanceolate or lanceolate, entire or sub-pinnatifid, acute; rameal-leaves scattered, linear-lanceolate, entire, about 30 × 5 mm., occasionally numerous and involucrate at base of capitulum. Branches arising from base of stem or from the middle or extreme summit, erect or erect-spreading, simple or branched towards the extremity, the lower 10-21 cm. long, the upper very short, equalling length of capitulum or longer. Capitulum globose, before expansion globose-conical, solitary or geminate, medium, about 15 mm. or less in diameter, arachnoid at base. Involucre closely covered by brown or blackish appendages or less covered and yellowish phyllaries somewhat exposed; disks of lowest appendages narrowly lanceolate, or mid-series ovate or triangular, upper roundish, length of teeth about three times diameter of disk. Easily recognised in the sub-simple forms by habit, large scattered spaced leaves and solitary or geminate capituli; in the more branched forms by habit, spaced leaves, and stem and branches dividing towards the apices into short subequal secondary branches. Surrey—Leatherhead meadows, Epsom Downs, Chessington, Burgh Heath, etc. Mr C. C. Lacaita informs me that he is acquainted with this form and finds it puzzling.

CENTAUREA DRUCEI, sp. nov.

Stem erect, branched, branches erect-spreading, arising from base

or middle of stem, more or less uniform, reaching 30 cm. or more. Stem-leaves, lower sub-petioled, spreading, oblong-lanceolate, acute or subacute, pinnatifid, upper sessile, rameal leaves oblong-lanceolate or linear-lanceolate, entire, spreading, acute, and like the upper sessile stem-leaves provided usually with two prominent linear-lanceolate stipuliform basal lobes. Capituli globose, solitary, becoming umbilicate at base, appendages brownish, rarely blackish, closely covering the phyllaries or not; disks ovate or roundish, seldom lanceolate, teeth about twice as long as diameter of disk. The characters specified readily separate this from *C. obscura* Jord. and from *C. nemoralis* Jord. it can be distinguished by the larger globose heads becoming umbilicate at base; the flowering branches more ascending and clothed with more numerous leaves which often spread widely or are recurved; the usually broader disks of the appendages with teeth shorter, closer together, and less neat-looking; the *substipuliform* basal lobes of the sessile leaves. The last-mentioned character is, I believe, more constant in this form than in any other known to me. It is a feature that has apparently escaped the attention of botanists in forms of the *nigra* series, but receives due mention in the descriptions of members of the *Jacea* series, *e.g.*, Grenier & Godron in their account of *C. amara* and *C. Jacea*; Rouy in the case of *C. pratensis*; and Briquet when describing *amara*, *Jacea*, and *pratensis*. In this connection, it is interesting to note that Mr C. C. Lacaita, who is familiar with this form on the Sussex Downs, regards it as intermediate between *C. nemoralis* Jord. and *C. pratensis* Thuill., and is of opinion that French botanists would determine it as the latter. *C. Drucei* is found on chalk downs and in meadows, etc., in Surrey, Sussex, Essex, and probably is frequent in England. It is named in compliment to Dr G. C. Druce, as a slight acknowledgment of the great assistance rendered, especially in placing at my disposal his extensive set of *Centaurea* and all his gatherings of recent years, among which are Essex examples of the form here specifically separated. As in the case of allied species, there are several notable forms.

Forma *radiata*.—Outer florets radiant. Apesdown, Isle of Wight, 1921, C. C. Lacaita, Ref. No. 291/21 (as *C. pratensis* forma).

Forma *subternuda*. — Appendages not closely imbricate, yellowish-green phyllaries much exposed, especially in the lower half of capitulum, disks chiefly ovate, dark-brown, teeth lighter brown. Twinstead, N. Essex, 1919 (G. C. Druce, Ref. No. 079). See *Rep. B.E.C.* 826, 1919.

Forma *gracilis*.—Leaves linear, entire, the lowest only pinnatifid. Surrey—Tadworth; Sussex—Downs near Brighton.

Forma *angustisquama*.—Appendages blackish, disks linear-lanceolate or lanceolate. Surrey—Lower Morden.

Forma *tomentosa*.—Leaves very hairy, stems especially clothed with woolly hairs and felted towards the apex. Surrey.

CENTAUREA NEMORALIS Jord. Pug., pl. nov.

From the description in the work cited, it is seen that the chief features of this are the tall, much branched stems, slender, erect-spreading branches, capituli roundish ovoid, appendages lanceolate, brown rather than black. Contrasting it with what at that time he regarded as *C. nigra* L., but afterwards distinguished as *C. obscura*, Jordan wrote that it differed by its later time of flowering (two months), the involucre much less globose in shape, brownish appendages, lanceolate and not broadly ovate, fruits narrower, stem taller with many more flower heads, branches slender and widely spreading. Taken as a whole these characters readily separate *C. nemoralis* from *C. obscura*. This is probably the most abundant member of the *nigra* group, at least in southern England, occurring in meadows and pastures on most soils, especially on the chalk, a formation avoided in general by *C. obscura*. As regards native forms there is greater diversity than is shown by its ally, and no rigid adherence to any one character mentioned by Jordan is possible. It appears likely that many forms growing in Britain are further apart from *C. obscura* than the type specimens of *C. nemoralis*. Such plants require further study. Noticeable features of British plants are the less rounded and more ovoid heads with the phyllaries frequently exposed by the spreading not appressed appendages which are perhaps less numerous. This deviation does not appear to justify the creation of a distinctive name, as these plants insensibly grade into others in which the appendages fully cover the phyllaries. Most of the

British plants may be arranged in two series according to the form of the leaves. It may seem a weak point to distinguish varieties on leaf-values only, but this course is adopted as the characters of the leaves seem more stable than any presented by the capituli and appendages, and to be independent of the water-content of the soil.

Var. *diversifolia*, var. nov.—Lowest stem-leaves oblanceolate, oblong-oblanceolate, or lanceolate, 12-18 × 2 cm., narrowed into petiole ½ to ⅓ their length, sinuate-dentate or sinuate-pinnatifid, acute; mid stem-leaves oblong-linear, pinnatifid, rameal leaves linear or linear-lanceolate, entire, acute, 2-4 × .5 cm. Frequently the broad elongated lower leaves are decayed at the flowering time, and then the abrupt change from the larger stem leaves to the narrow rameal leaves is usually sufficient to identify the variety. Common. Cultivated specimens coming under this (Ref. No. 2367) were distributed through Bot. Exch. Club, 1921.

Forma *consimilis*.—Appendages very pale brown or somewhat darker, teeth much lighter in colour. = *C. consimilis* Bor. Fl. du Centre, ed. 3, 351, but not all specimens so named by the author, as an example in Herb. Kew from Angers, 13 Juin, 1876, is, as noted by Mr C. C. Lacaita, only *C. obscura* Jord. Surrey, Wales, Ireland (Herb. Druce).

Forma *longiflora*.—Similar in character to the form of the same described under *C. obscura*. Surrey, Kent.

Forma *radiata*.—Capituli with marginal florets enlarged and rayed. In some localities of rare occurrence, in others, the usual form of the species, in which case observers are tempted to refer this to forms belonging to the *Jacea* cycle. Dr G. C. Druce's *C. nigra* L. var. from Lane End, Bucks, August 1921 (Ref. No. W.77) distributed through the Bot. Exchange Club, is placed here. It excellently illustrates the varietal characters.

Forma *latisquama*.—Disks of appendages broader, mostly roundish. W. Kent—Ifield.

Var. *subintegra*, var. nov.—Leaves broadly linear or lanceolate, entire, sub-entire, or the lowest serrate, seldom pinnatifid, usually exhibiting a complete transition from the lowest basal leaves to the upper rameal leaves. Surrey, Sussex, etc.

Forma *longiflora*.—Florets pseudo-radiate as in similarly named forms. Surrey, etc.

Forma *radiata*.—Marginal florets radiant. The remarks on var. *diversifolia*, f. *radiata* equally apply. Surrey, Sussex, etc.

Forma *decidua*.—Pericline with appendages partly or wholly falling away, leaving the greenish phyllaries almost wholly uncovered. Not an accidental state. W. Kent—Ifield, and elsewhere.

Var. *minima*, var. nov.—Dwarf plants 12 cm. or so in height, stems usually simple, basal leaves half as long as, or as long as, stems. Radical leaves lanceolate, elliptical-lanceolate, or ovate, sub-entire or sinuate-pinnatifid. Capituli small, appendages brown to blackish, sometimes very light in colour, often not wholly covering phyllaries, disks subulate, linear or lanceolate, rarely broader, teeth scarcely longer than breadth of disk, or twice as long. Heaths and exposed downs—Surrey, Sussex, Hants, etc.

Forma *radiata*.—Marginal florets rayed. In similar situations to the preceding, and has frequently been named *C. nigra*, var. *decipiens* (Thuill.) Bab.

Var. *microptilon* mihi = *C. microptilon* Gren. in Mem. Soc. libre d'emul. du Doubs, iii., 20-22 (1849); Gren. & Godr. Fl. Fr. ii., 243; *C. pratensis* Thuill., subsp. *C. microptilon* Rouy Fl. Fr. ix., 126; *C. nigrescens* Willd., subsp. *C. ramosa* Gugl., var. *microptilon* Gugl. The name *microptilon* was first used by Godron in Fl. Lorr. ii., 54, where under *Centaurea vulgaris* (a name equivalent to the whole *Jacea-nigra* series) is found var. "*microptilon* nob.," with the following diagnosis: "Appendices du pericline étroits, longuement subulés; planes, réfléchis au sommet, ciliés, écartés, et laissant voir les folioles." To this was referred *C. nigrescens*, var. *intermedia* Gaud. Fl. Helv. 5, 397, which is described by that author as having "Foliis lanceolatis integriusculis, calycibus subinde recurvatis pectinato-subplumosa." The British plants referred to this variety present the following characteristics. Stem about 45 cm., branched from below the middle, lower branches attaining a length of about 24 cm., the upper scarcely as long, usually exceeding the stem, all spreading or erect-spreading, usually simple. Lower leaves oblanceolate or linear-oblanceolate, sub-entire, dentate or dentate-pinnatifid,

rameal leaves linear, entire. Capituli ovoid or conical-cylindrical, small, about 13 × 9 mm. before expansion, appendages not appressed, mostly subulate or linear-lanceolate, elongated, the upper part curved outwards, the lowest appendages spreading. The greenish or arachnoid phyllaries are conspicuous, and the arched character of the appendages is most noticeable before the expansion of the capitulum. Pappus entirely absent, represented by a few minute scales, or well-developed. Grenier described *C. microptilon* as being abundant in the neighbourhood of Nancy, and cited numerous other localities. Rouy states that it grows by roadsides and edges of woods nearly all over France with the exception of the north and south. In Britain hitherto recognised only in the south of England, where it appears scarce. Surrey, Sussex, Berks. First recorded in *Rep. B.E.C.* 506, 1918. With reference to the Berkshire plant there referred to (J. Ball, 1842, in Herb. Kew) it is interesting to note that this probably attracted the attention of Babington, as in 4th edition of the *Manual of Brit. Botany* (1856) he wrote, " A plant from Berkshire has patent or recurved lanceolate-attenuate appendages, no pappus, slender leaves, and differs otherwise. *C. microptilon* Godr?" In later editions of the *Manual* this note is deleted.

Forma *grizollensis*.—Outer florets of the capitulum rayed. Sussex (Herb. Lacaita), Oxon (Herb. Druce).

Var. *Debeauxii* mihi = *C. Debeauxii* Gren. et Godr. (Grenier in Mem. Soc. libre d'emul. du Doubs, iii., 20-22, 1849); Gren. & Godr. Fl. Fr., ii., 243; *C. pratensis* Thuill. Forme [or Race] *C. Debeauxii* Rouy Fl. Fr., ix., 127; *C. nigra* L., sub-sp. *C. Debeauxii* Gugler. Surrey plants identified as *C. Debeauxii* are here described. Stem about 40 cm., branched above, branches spreading, 12-15 cm. long, usually simple; leaves linear or linear-lanceolate, sub-entire, lowest sometimes lanceolate pinnatifid; capituli small, yellowish-green phyllaries not obscured by the linear-lanceolate disks of appendages which are more or less erect and not recurved. The Surrey plants thus briefly described have precisely the habit, leaves, and small heads of the specimens of *C. Debeauxii* issued by Schultz Herb. Norm. 88 and Billot exsicc. 807, and are in agreement with Grenier's description, who states that his species is allied to *C. nigra* by reason of its appendages with long teeth, and having the fruit pappose, but is dis-

tinguished from this by its much smaller heads, narrower appendages, shape of fruit whose point of attachment is different, and habit, which is very like that of *C. microptilon*. From this last it is known by the smaller heads, appendages not distinctly curved outwards, and longer teeth; fruits pappose, less tapering at the base. As regards the point of attachment of the fruit no reliable character can, I think, be drawn from this as the feature in question is not restricted to *Debeauxii*. Continental specimens differ from British plants in that they have " neater " looking heads owing to the disks of the appendages being darker than the teeth, more spaced, and slightly more uniform in shape, consequently it is proposed to term the native plants f. *anglica*. Disks of lowest appendages subulate, succeeding series as far as centre of head, linear-lanceolate, next series lanceolate, grading to roundish above. Otherwise like var. *Debeauxii*. Specimens of this were gathered by Dr G. C. Druce at Wilbury, Beds, and distributed through the Bot. Exch. Club (see *Reports* 1905 and 1919). It also occurs on chalk downs in Surrey.

The reason that has actuated the writer in reducing both *C. microptilon* Gren. and *C. Debeauxii* Gren. et Godr. to the rank of varieties of *C. nemoralis* Jord. is to be found in the circumstance that they only occur in the company of the latter species and that very sparingly. Under these conditions it is impossible to look upon them as distinct species.

Perhaps some surprise may be expressed at the recognition of two additional species of *Centaurea* and some further information may be thought desirable. It is quite certain that *C. surrejana* and *C. Drucei* cannot be placed under either *C. obscura* Jord. or *C. nemoralis* Jord., and it is equally certain that they have as good a claim to recognition as either of Jordan's species. The descriptions of this author and study of his authentic specimens abundantly justify these conclusions. It will be noted that the brief descriptions of the British forms make no mention of the hairs clothing the leaves, etc. In one case only has it been thought necessary to do so, in other cases the clothing of the leaves, etc., does not call for comment.

Excluded names.—*C. nigrescens* Bab. Man., ed. 2 (1847); *C. nigra*, var. *decipiens* Bab. Man. ed. 5 (1862), etc.; *C. nigra*, var. *decipiens* Syme Eng. Bot., are but radiant forms of varieties of *C. nemoralis* Jord. as specimens named by the authors in question

plainly show. To *nemoralis* must also be referred *C. Jacea*, var. *nigrescens*, and var. *pratensis* of Williams' *Prodromus*. *C. decipiens* Thuill. : Briquet who has seen the type specimens in Thuillier's herbarium, says that this agrees perfectly with original specimens of *C. serotina* Bor. *C. nigra*, var. *rivularis* Williams' Prodr. Fl. Brit. i., 60. As far as I have had an opportunity of studying them, the plants referred by Williams to this are not *nigra* forms, but come in the *Jacea* group, being mostly representatives of *C. pratensis* Thuill. The true *C. rivularis* Brot. is closely related to *C. pratensis* and quite possibly British, as some Surrey plants are scarcely distinguishable from it. Under the name of *Centaurea microptiloides*, Mr C. C. Lacaita has distinguished plants noticeable for the narrow disks of appendages which do not overlap, and, in consequence, render visible the underlying phyllaries. The disks range from subulate, ovate-lanceolate, to roundish above. This form is plentiful in south England, and appears to me to be connected through numerous intermediate forms with other plants in which the phyllaries are concealed by the appendages. It is mentioned here, but not assigned a position in the series of forms included under *C. nemoralis* Jord. (to which, in my opinion, it undoubtedly belongs) as the author of the name has not yet published a description. Cultivated examples [Ref. No. 2425] were distributed by the writer through the Bot. Exch. Club (see *Report* 1921).

I am under great obligations to Dr G. C. Druce, Messrs C. E. Salmon, W. C. Barton, and W. R. Sherrin for the loan of Centaureas from their herbaria, and to other botanists for the privilege of seeing specimens.

cences in the same season. This suggests that the viviparous type of *F. ovina* is genetically different in this respect from the normal seed-bearing types, and this suggestion is considerably strengthened by facts to be mentioned later in this paper.

It seems very probable that in its natural habitat, this plant is normally propagated by means of " bulbils " produced in the viviparous inflorescences, even if this may not be the only method of propagation. The writer knows of no record showing that such is the case, nor even of records showing whether plants produced from these " bulbils " produce normally viviparous plants.

Hackel* classifies a viviparous type of *F. ovina* as *F. ovina* sub-sp. *eu-ovina*, var. *supina*, sub-var. *vivipara*, and he mentions that this has been found constant under garden conditions.

The North Wales specimens examined by the present writer do not seem to conform exactly to Hackel's description, but it is not intended at present to discuss the systematic position of these fescues. The viviparous type, however, may ultimately be found to deserve a higher position than subvarietal.

The North Wales type was also found to be similarly constant (or practically so) under garden cultivation at low elevations.

In 1916, a test of a somewhat different character was started. Viviparous inflorescences were collected near Rhyd-ddu, Carnarvonshire, and the " bulbils " planted at first in pots, and when established, transferred to open ground in the Advisory Grounds, University College of North Wales, Bangor, at an elevation of less than 50 feet above sea level. Two such plants were obtained, and in their positions in the Advisory Grounds they were associated with other indigenous types of *F. ovina* and of *F. rubra*, all spaced out.

In 1917, these two plants gave rise to a few inflorescences which appeared to be in no way different from those produced in the natural habitat of the viviparous type of *F. ovina*.

In 1918 a far greater number of inflorescences were developed, and all appeared to be normally viviparous. Very late in the season, however, one or two inflorescences were produced in each plant which approached much more nearly to the normal seed-

*Hackel, E. : *Monographia Festucarum Europaearum*. Theodor Fischer, Kassel and Berlin, 1882, p. 89.

bearing type found in typical *F. ovina*. Even these showed distinct vivipary, but a few apparently normal florets were found, and later, when the plants were harvested and carefully searched, six "seeds," with apparently well developed caryopses, were found.

It was, unfortunately, impossible to plant these in 1919, but in 1920 (when the seed was nearing two years old) they were planted in the gardens of the Plant Breeding Station at Aberystwyth, and four plants were obtained.

In the same year, part of one of the two parent plants was transferred to Aberystwyth, and in 1921 it behaved as in 1918; producing at first an abundance of normally viviparous inflorescences in spite of the naturally dry character of the ground and the abnormally dry summer, and then much later, one or two inflorescences approaching the normal seed-bearing type.

The writer has not been able to ascertain whether such late seed-bearing inflorescences may be produced by the normally viviparous plant when growing in its natural habitat, nor whether such a plant would produce them if transferred bodily to a drier habitat. Since it seems reasonable to assume that these plants are the natural progeny of "bulbils" in most, if not in all, cases, there seems to be no reason to suppose that they would behave differently from those obtained by the writer from such "bulbils." In any case, it was clearly shown in 1921 that plants produced from "bulbils" in 1916 had not perceptibly progressed towards the seed-bearing condition.

The fact that the great majority of the inflorescences produced by this type of *F. ovina* are fully viviparous, and that only very late in the season are more or less seed-bearing inflorescences developed, shows that, as already suggested, the order of things has been completely reversed as compared with most grasses.*

In 1921, another phenomenon was noticed in the parent plant (hereafter referred to as Bl. 303) transferred from Bangor. At about the same time that the late seed-bearing inflorescences appeared some of the "bulbils" in the fully viviparous inflorescences produced short secondary flowering stems with small secondary inflorescences consisting of about five spikelets. These spikelets very closely

*It is, of course, open to argument which of the two methods is the more primitive.

approached the normal and showed but slight signs of vivipary. Such secondary inflorescences are diagrammatically shown in Fig. 10. (The inflorescence there represented, however, belonged to another plant.)

The four plants obtained from seed were grown under garden conditions in 1921, along with plants obtained from seed of non-viviparous types of *F. ovina* and *F. rubra*, but as in none of the latter (except very late in the season in one *F. rubra* plant) were viviparous inflorescences produced, any vivipary shown in these four plants must be ascribed to the inherent qualities of the plants themselves.

As already mentioned, however, the seeds themselves were produced under open conditions. That is to say, the parent plants were not protected, and since cross-pollination is probably the normal method in these grasses, it is possible that some or all four seeds were themselves hybrid in character. It is most unlikely that the two parent plants mutually pollinated each other as they were planted at a considerable distance apart, with other plants, both *F. ovina* and *F. rubra*, in between.

The four plants alluded to above will henceforward be referred to as Bl. 178 (1), Bl. 178 (2), Bl. 178 (3), and Bl. 181 (1). The first three were obtained from seed produced by the same parent plant.

The inflorescences produced in 1921 by Bl. 178 (1) and Bl. 178 (3) were apparently throughout quite normal seed-bearing in character, except that an occasional inferior palea was unequally bifurcated or trifurcated. The writer has not found this bifurcation of the inferior palea in normal seed-bearing *F. ovina*, but it may occur. For reasons connected with the further study of the plants, it was not possible in 1921 to ascertain whether the two plants in question were capable of producing a fair amount of seed or not, and for the present a discussion of these two plants will be deferred.

The great majority of the inflorescences of Bl. 178 (2) and at least a few of those of Bl. 181 (1) were quite obviously viviparous when they emerged from the sheath. Those of Bl. 178 (2) resembled the fully viviparous inflorescences of the parent plant, Bl. 303, in general appearance, but the " leaves " in the inflorescences were markedly shorter. Some of the inflorescences of Bl. 181 (1) bore " leaves " equal in length to those of the parent plant, but in other respects even

these differed widely from those of Bl. 303, while other inflorescences differed from all other types of *F. ovina* hitherto met with by the writer. In fact, most of the inflorescences of Bl. 178 (2) and Bl. 181 (1) were obviously different both from those produced by normal seed-bearing types of *F. ovina* and from fully viviparous types, not excepting the late inflorescences produced by the latter type.

A large number of the spikelets of the parent plant, Bl. 303, of Bl. 178 (2), and of Bl. 181 (1) were carefully dissected, and some of the more interesting departures from normal are described below. For descriptive purposes, the " normal floret " is considered to consist of an inferior palea and a superior palea enclosing three stamens and a normal ovary. The lodicules were but rarely observed.

In order to facilitate description, diagrammatic sketches have been prepared. These have not been drawn exactly to scale, since they are only intended to indicate the order in which the various structures occurred.

Bl. 303.—Parent plant.

The late inflorescences could not be investigated in detail, but these were so few that for practical purposes the plant may be considered to be fully viviparous, as in fact were the very great majority of the inflorescences. These inflorescences with their viviparous spikelets were so uniform that it seems quite sufficient to describe a single spikelet. Fig. 1.

Starting from below :—

(a) Pair of normal glumes.

(b) One or two structures, usually rather more closely resembling the first pair of glumes than inferior paleae, and, as in the case of the first pair of glumes, bearing no trace of superior paleae nor of male or female organs. In some cases both members of this second pair were absent; in other cases only one was present. When all four are present, the lowermost is usually the shortest, and the uppermost may be appreciably longer than an ordinary inferior palea of *F. ovina*. In some cases the upper two more closely resemble sterile inferior paleae than glumes.

(c) A sheath-like structure considerably longer than those under (a) and (b) above, but with no lamina. Probably of the nature of a praefolium.

(d) A leaf, well marked into sheath and lamina, forming the outer part of a vegetative bud; no trace of male or female organs.

In no case apparently does a bud arise in the axils of the structures placed under (a) and (b) above, but one has been found in the axil of (c). In the course of the season the main vegetative bud, as already shown, may even produce a secondary inflorescence. In one such case examined June 11th, 1921, there were three leaves above (c), definitely spaced out on a secondary flowering stem, with vegetative buds in the axils of (c) and the lowest stem leaf. In this particular case there was a bract-like structure at the base of the secondary inflorescence* and the inflorescence consisted of five apparently normal spikelets.

Bl. 178 (2).

On the 24th May 1921, 52 inflorescences had emerged or were emerging from their sheaths, and each one showed vivipary in most spikelets, and all spikelets appeared to resemble each other rather closely. As will be seen from the descriptions and figures there was a considerable difference in detail. Three inflorescences were critically examined on 31st May, but representative spikelets only can here be described and figured.

Inflorescence A.

(1) Lowest spikelet of inflorescence. Fig. 2.

(a) Pair of normal glumes.

(b) A structure exactly similar in size and shape to the inferior palea of a normal floret, but lacking a corresponding superior palea and lacking male and female organs†.

(c) Normal floret.

*Such a bract frequently occurs also at the base of the late sub-normal inflorescences produced by this fescue.

†As such structures were frequent in the spikelets of Bl. 178 (2) and Bl. 181 (1), in further descriptions they will only be referred to as "Sterile inferior palea."

(d) A pair of elongated paleae (inferior palea 7.5 mm. long as compared with the normal 4 mm.), enclosing apparently normal male and female organs.

(e) Terminal floret consisting of a leaf well marked into sheath (5 mm. long) and lamina (7 mm. long) enclosing a second younger leaf but no trace of male or female organs.

(2) Lowest spikelet at second branching of inflorescence. Fig. 3.

(a) Pair of normal glumes.

(b), (c), and (d) Sterile inferior paleae.

(e) Elongated pair of paleae (inferior palea 10 mm., superior palea 5 mm. long), enclosing apparently normal ♂ and ♀ organs and lodicules.

(f) A vegetative bud of three leaves, the outer leaf 14 mm. long and well marked into sheath and lamina.

(3) Terminal spikelet. Fig. 4.

This spikelet was much nearer normal than any of the others.

(a) Normal glumes.

(b), (c), and (d) Normal florets.

(e) Terminal floret: inferior palea slightly longer than normal and both ♂ and ♀ organs rudimentary.

Inflorescence B.

(1) Lowest spikelet. Fig. 5.

(a) Normal glumes.

(b) Sterile inferior palea.

(c) Normal floret except inferior palea elongated to 5.8 mm.

(d) Inferior palea sheath-like, 13 mm. long; superior palea abnormally short; ♂ and ♀ organs very poorly developed.

(e) A rudimentary floret with extremely minute stamens but no ovary recognisable.

(2) Spikelet at fourth branching of inflorescence. Fig. 6.

(a) Normal glumes.

(b) Sterile inferior palea.

(c) Inferior palea of normal length; no superior palea; well developed lodicules; a fairly well developed ovary, but no trace of stamens.

(d) Inferior palea 10 mm. long, purplish and sheath-like with margins overlapping; superior palea 4.5 mm. long; ♂ and ♀ organs normal.

(e) Rudimentary ♂ and ♀ organs together with a leaf-like structure 3.5 mm. long enclosed within the sheath of a leaf. Sheath of this leaf 4 mm., lamina 5 mm. long.

(3) Terminal spikelet. Fig. 7. Cf. Figs. 1 and 9.

(a) Normal glumes.

(b) Sterile inferior palea.

(c) Sheath-like structure, margins overlapping, 7.2 mm. long; no superior palea nor ♂ or ♀ organs.

(d) Vegetative bud; outer leaf 7 mm. long; no ♂ or ♀ organs.

Inflorescence C.

(1) Spikelet from middle of inflorescence. Fig. 8.

(a) Normal glumes.

(b) Sterile inferior palea.

(c) Slightly elongated sterile inferior palea.

(d) Sheath-like inferior palea, and a relatively short superior palea enclosing poorly developed ♂ and ♀ organs.

(e) A leaf structure with no trace of ♂ or ♀ organs.

(2) Terminal spikelet. Fig. 9.

(a) Normal glumes.

(b) Slightly elongated sterile inferior palea.

(c) Much elongated, sheath-like structure (8.5 mm. long)

(d) Vegetative bud, the outer leaf well ribbed in upper part.

The terminal spikelets in inflorescences B and C (Figs. 7 and 9) are seen to be fully viviparous and exactly similar to such spikelets found in the parent plant Bl. 303 (Fig. 1). On the other hand, the terminal spikelet in inflorescence A was almost normal. In this plant therefore it is very probable that spikelets could be found forming a complete series bridging the normal and the fully viviparous.

The spikelets in this plant also suggest a method by which one type of inflorescence may have evolved from the other.

Bl. 181 (1).

When examined on 24th May 1921, 48 inflorescences (three of which were dead) had emerged or were emerging from their sheaths. Five of these, including one of the dead ones, showed very marked but quite abnormal vivipary. One of these, which is shown diagrammatically in Fig. 10, may here be briefly described :—

Inflorescence A. Fig. 10.

Lowest branching—Only one branch at base, but this compound.

Lowest spikelet—Normal at base, but giving rise within its tip to two secondary spikelets. Such a spikelet is fully described under Bl. 181 (1), Infl. D (3), and is shown diagrammatically in Fig. 19.

2nd spikelet—Long and distinctly curved : such a spikelet is described under Bl. 181 (1), Infl. C (3), and is shown diagrammatically (without curvature) in Fig. 15.

3rd, 4th, and 5th spikelets as 2nd.

6th spikelet abortive.

7th and 8th spikelets as lowest.

9th spikelet as lowest but giving rise within its tip to four secondary spikelets.

Second branching—Simple, six spikelets.

Lowest spikelet simply (but fully) viviparous, producing a leafy shoot but no secondary inflorescence.

2nd and 4th spikelets as lowest.

3rd, 5th, and 6th spikelets abortive.

Then followed spikelets borne singly on the main axis; the lowest four abortive, the 5th at first simply viviparous but giving rise to a secondary inflorescence of five apparently normal spikelets.

Terminal spikelet similar to the fifth.

The other four inflorescences differed considerably in detail from the one described, but all five were obviously of the same general type.

The remaining inflorescences of this plant appeared to approach much more closely to the normal *F. ovina* inflorescence, but these

again varied; some of them having practically the appearance of normal inflorescences, while others were distinctly abnormal, although not obviously viviparous. Four of these were examined in detail; B and C most nearly approaching the normal.

Inflorescence B.

At lowest branching six spikelets occurred, three of which were normal. Another was also normal except that one inferior palea was unequally bifurcated. The remaining two spikelets each had a sterile inferior palea following immediately after the glumes, but were otherwise normal.

Two of the four spikelets at the second branching were also normal, and another was normal except that a sterile inferior palea occurred between the glumes and the normal florets.

The remaining spikelet (Fig. 11) was quite abnormal:—

(a) Two glumes, the lower very small.
(b) Sterile inferior palea.
(c) A normal inferior palea with apparently a second such palea within it with its margins completely united with the margins of the superior palea to form a sac, within which were normal ♂ and ♀ organs.
(d) etc. Seven normal florets and a terminal abortive one.

None of the remaining eight spikelets of the inflorescence was normal. As a rule, however, the abnormality consisted of one or two sterile inferior paleae being interposed between the glumes and the normal florets. In one case (Fig. 12) this was varied as follows:—

(a) Normal glumes.
(b) and (c) Sterile inferior paleae.
(d) Normal floret.
(e) Sterile inferior palea.
(f) etc. Six normal florets and a terminal abortive one.

In another spikelet one inferior palea was unequally trifurcated.

Inflorescence C.

In this inflorescence there were 17 spikelets, nine of which were apparently quite normal. The other spikelets differed but little from the abnormal spikelets described under inflorescence B.

Inflorescence D.

This was obviously farther from normal than B and C, and possessed a much higher proportion of long, curved spikelets. Only a few spikelets, to serve as types, will be described for this and for inflorescence E.

(1) Lowest spikelet in inflorescence. Fig. 13.
  (a) Normal glumes.
  (b), (c), and (d) Normal florets.
  (e) Normal inferior palea, rudimentary superior palea; normal ♀ organ; one deformed stamen.
  (f) etc. Four normal florets and a terminal abortive floret.

(2) Fourth spikelet in lowest branch. Fig. 14.
  (a) Normal glumes.
  (b) Sterile inferior palea.
  (c), (d), and (e) Normal florets.
  (f) Sterile inferior palea.
  (g) Normal inferior palea; superior palea forming a complete sac enclosing a normal ovary and one stamen.
  (h) etc. Six normal florets.

(3) Lowest spikelet at second branching. Fig. 15.
  A typical "curved" spikelet.
  (a) Normal glumes.
  (b) Sterile inferior palea.
  (c) Normal floret but with only one stamen.
  (d) and (e) Normal florets.
  (f) etc. Seven sterile inferior paleae followed by four normal florets and a terminal abortive floret.

(4) Lowest spikelet at third branching. Fig. 16.
  (a) Normal glumes.
  (b) Sterile inferior palea.
  (c) Normal paleae and ovary but only one stamen.
  (d) Inferior palea normal, but within it an additional inferior palea with superior palea and ovary but no stamens.
  (e) Normal floret.
  (f) Terminal abortive floret.

Several of the remaining spikelets in this inflorescence abortive, but most of the spikelets agreed more or less closely with one or another of those described.

Inflorescence E.

Most of the spikelets in this inflorescence differed but little from one or another of those described under inflorescence D. The following additional types are, however, interesting :—

(1) Fig. 17.

(a) Normal glumes.
(b) Sterile inferior palea.
(c) Normal floret, except only two stamens present and inferior palea unequally bifurcated.
(d) Normal floret, except only two stamens present.
(e) As (d).
(f) Normal floret.
(g), (h), and (i) Sterile inferior paleae.
(j) etc. Four normal florets and a terminal abortive one.

(2) Fig. 18.

(a) Normal glumes.
(b) Sterile inferior palea.
(c) Normal inferior palea; superior palea forming a complete sac enclosing a normal ovary and one stamen.
(d) Normal floret.
(e) and (f) Sterile inferior paleae.
(g) Exactly as (c) above.
(h) and (i) Normal florets.
(j) Normal floret except only one stamen present.
(k) and (l) Sterile inferior paleae.
(m) and (n) Normal florets.
(o) Terminal abortive floret.

(3) Fig. 19.

(a) Normal glumes.
(b), (c), and (d) Normal florets.
(e) As (c) in (2) above.
(f) Sterile inferior palea.
(g) Sterile inferior palea deeply but unequally bifurcated.

At this point the rachilla of the spikelet became bifurcated, giving rise to two secondary spikelets deeply set in on (f) and (g) respectively. That on (f) consisted of two sterile inferior paleae, three normal florets, and a terminal abortive floret, while that on

(g) consisted of one sterile inferior palea followed by four normal florets and a terminal abortive floret.

(4) The sub-terminal spikelet (not figured).

(a) Normal glumes.
(b) and (c) Sterile inferior paleae.
(d) Normal floret.
(e) As (c) in (2) above, except superior palea short and deformed.
(f) Sterile inferior palea.
(g) Normal floret.
(h) Normal floret except only one stamen present.
(i) Normal floret.
(j) Sterile inferior palea.
(k) etc. Three normal florets and an abortive terminal floret.

It is quite obvious from the above descriptions that not only do Bl. 178 (2) and Bl. 181 (1) differ quite markedly from the normal and from the fully viviparous, but that they also differed from Bl. 178 (1) and Bl. 178 (3). They also further differed quite markedly from each other in 1921.

Bl. 178 (1) and Bl. 178 (3) were so nearly normal in 1921 that the question arises whether by some accident seeds of normal plants had not been accidentally substituted for the original ones. This is, of course, possible, but not very probable as great care was taken with these seeds. The other possibilities seem to be either :—

(1) That the parent viviparous plant was hybrid in character, and that Bl. 178 (1) and Bl. 178 (3) were normal segregates; or

(2) That in 1918 cross-fertilisation took place and that the normal character of the inflorescence is dominant over vivipary.

As it is intended to study these plants further, the question need not at present be further discussed.

The fact that Bl. 178 (2) and Bl. 181 (1) differed so markedly from each other while yet showing very obvious signs of vivipary is interesting. In both plants fully normal and fully viviparous

spikelets were found, but the intermediate stages were quite different in the two plants. This suggests the following possibilities, either :

(1) That the two parent plants were genetically different; or

(2) That the individual seeds which produced the two plants were different even though the two parent plants were genetically identical. Such a state of affairs would occur if one of the seeds had been produced by self-fertilisation and the other through cross-fertilisation. It is rather curious, however, that the fully viviparous condition was not reproduced in either plant except in individual spikelets.

The various types of florets occurring in Bl. 178 (2) and Bl. 181 (1) tempt one to search amongst them for an elucidation of the phylogeny of the various parts of the grass spikelet. This, however, will not at present be attempted, as Bl. 178 (2) and Bl. 181 (1) show obvious differences from each other, and it is not known whether either of them really affords a reliable clue to this problem.

From the facts given above the following conclusions appear to be justified :—

(1) The vegetative buds produced in normally viviparous inflorescences of *Festuca ovina*, even when cultivated under garden conditions at low elevations, produce normally fully viviparous inflorescences.

(2) Such plants may, at least in some seasons, develop late inflorescences which may produce seed when the plants are grown unprotected alongside normal types of *F. ovina* and *F. rubra*.

(3) The foregoing characteristics have been found constant over four seasons and the proportion of late sub-normal inflorescences does not seem to increase from year to year.

(4) Seeds produced by such late sub-normal inflorescences may in their turn give rise to plants which show very distinct vivipary, the vivipary in some spikelets being normal and complete.

(5) It follows, therefore, that vivipary in *F. ovina* is to some extent at least hereditary, and that it is inherited not only through the vegetative buds developed in the fully viviparous inflorescences, *but also through such "seeds" as the plant may be able to produce.*

(6) Seeds produced by such sub-normal inflorescences under unprotected conditions may give rise to plants the inflorescences of which may differ very markedly from each other even though each in its own way may be showing very distinct traces of vivipary.

NOTES ON THE SEEDS OF THE BRITISH DACTYLORCHIDS.

By T. A. Dymes, F.L.S.

In this paper I have purposely used the non-committal name "Spotted Orchis" for that form, and that form only, of the polymorphic species, commonly known of yore as *O. maculata* L., which Dr Druce has described separately as *O. Fuchsii*; it does not include the form or forms described by their author as *O. elodes*, *præcox*, or *ericetorum*. I do this, not as a bigoted die-hard, but because in my complete ignorance of the critical niceties of botanical nomenclature I hold no opinion upon such controversial questions, my object being to avoid confusion. Similarly *Orchis ericetorum* Lint. stands for what Dr Druce believes to be *Orchis maculata* L., what Webster described as *O. præcox*, and what may, or according to some, may not be *O. elodes* Griseb.

Whatever the merits of the case may be, however, few, if any, of those who are interested in our native Marsh Orchids will dissent from the view that the Spotted Orchis, in the sense just indicated, and *O. incarnata* L. deserve separate recognition, whether they be called species or by some other equally vague if less controversial name.

Their morphological differences, appreciable with the naked eye, or a lens, are sufficiently conspicuous, to say nothing about others, but perhaps on account of their smallness the seeds appear to have received little or no attention. With a strong belief in the conservative virtues of seeds in general, and with some slight practical acquaintance with them in other connections, the present writer decided to put them into the witness box, so to speak, in

order to test the value of their evidence for elucidating the problems presented by the British forms of that section of the genus Orchis which is aptly known as Dactylorchis. For this purpose none but thoroughly ripe seeds are of any use, for those that are immature are very misleading.

When mounted as transparent objects and examined with a microscope they are seen in surface view to consist of a gauzy cage, the testa, open at one end, the basal, where it broke away from the placenta, and enclosing a darker body, the kernel, which is the embryo and endosperm closely invested by the inner integument.

Roughly speaking the kernel is oval or oblong in outline, but the symmetry is compromised at the basal end by a protrusion through the integument, like the rim of a funnel, which belongs morphologically to the suspensor, and through which the mycorrhiza gains admittance to the interior.

The funnel-rim is easily recognised by its position, its distinct form, and its colour, which in my own preparations is usually ruddy. At the opposite or apical end of the kernel the cells often differ in colour from those of the rest of the integument, and it may be that this marks the spot through which the infant seedling will break on germination.

I must emphasise the necessity of using only ripe seeds and, so far as the kernel is concerned, these are they that respond to the following tests :—

1. That the funnel-rim be cleanly cut and clearly defined, without any remains of the suspensor between itself and the base of the testa.

In immature seeds such remains appear as a frayed or ragged streak tailing off untidily, often for a considerable distance.

2. That the margin of the kernel and also its component cells be likewise cleanly cut and clearly defined.

In immature seeds the common walls and the surface of the cells themselves are indistinct and blurred, and moreover the kernel is larger, because water has still to be expelled before the resting stage is reached. The colour differentiation of the apical cells is not always in evidence, but whenever it is, I pass that seed as worthy of examination unless the other two points are unsatisfactory.

Although I do not know the meaning of such differentiation, I am not sure that seeds that are without it are fully mature.

It is not always easy to be certain about the testa. The question must be decided in case of doubt not only by the condition of the kernel which, I believe, ripens first, but by exercising judgment and by examining the individual about which one is dubious for characteristic features presented by its more finished fellows from the same plant.

But to return to the Spotted Orchis and *O. incarnata*. They differ from one another in several ways, for example in colour, shape and size, as well as in the details of both testa and kernel.

The difference in colour, however, is but slight, for when both are seen in bulk with the naked eye all that can be said is that the testa of *incarnata* is a shade darker than the other's.

As to size, *incarnata* has the smaller seeds, which are shorter but broader than those of the Spotted Orchis. The seeds of the latter are broadest in the middle, and the apical half of the testa, above the kernel, is curved and tapers almost to a point; in *incarnata* the apical half is neither curved nor tapering, the broadest part of the testa being on the contrary near the apex. In both cases the seeds narrow to some extent from kernel to base.

The testa of the Spotted Orchis consists of cells that are mostly long and narrow, and the common walls are narrow too, whereas those of *incarnata's* are comparatively broader and shorter, with broader common walls, which, rising above the general level, give the appearance of marginal papillae here and there.

But there is another interesting difference, for the testal cells of the Spotted Orchis show coils of thickening which are entirely absent from those of *incarnata*.

Turning now to the kernel, differences are to be noted both in shape and size. The Spotted's is longer than *incarnata's*, and also narrower; in other words, *incarnata's* is the rounder; it is oval rather than oblong.

However slight they may appear in description, all these differences are so marked and so constant that having once appreciated them, one could never mistake the seed of the one for that of the other, nor a testa without a kernel, or even a kernel without a testa, provided always that one is dealing with ripe seeds.

It may be of interest to add that the testa of the Spotted Orchis is about four times, and of *incarnata* about three times, as long as the greatest breadth, the length of the kernel of the Spotted being $1\frac{2}{3}$, and of *incarnata* $1\frac{1}{3}$ times the breadth. These figures were deduced from eighteen seeds of each form from several different places in the British Isles, and the range of variation was so limited that if the shortest seed of either had been a little more than a yard, the longest would still have been appreciably less than a metre, and the same may be said even more emphatically for the kernel.

A third Marsh Orchis, easily recognised, at anyrate in its most pronounced form, is *O. praetermissa* of Dr Druce, and its ripe seeds can be known from both of the other two's without much difficulty.

The difference in colour is hardly, if at all, appreciable. As to shape, the testa of *praetermissa's* is broadest around the kernel, or just above it, whereas the broadest region of *incarnata's* is much nearer the apex.

Praetermissa's seeds are the largest of the three, being longer than those of the Spotted Orchis' and broader both actually and proportionately, but in all other respects they approach closely to *incarnata's*.

The testal cells are of the same type, with broad, raised, common walls, but without any coils; in *praetermissa* they are larger than in *incarnata*, so that the former has the looser and the latter a decidedly closer mesh. Again, *praetermissa's* is distinctly the narrower seed, for it is just over four instead of three times as long as its greatest breadth.

Praetermissa's kernel is somewhat larger than *incarnata's*, and the difference is noticeable because it is almost as broad as the testa itself in that region, whereas in *incarnata* it is narrower than the testa around it. The result is that in *incarnata* there is a distinct margin of clear testal cells on either side of the kernel, whereas in *praetermissa* this margin is very much reduced. I measured it in six seeds of each form, and found that *incarnata's* averaged more than two and a half times the breadth of *praetermissa's*.

Thus these two differ in shape and size as well as in the other characteristics that I have indicated, perhaps on the whole more than one would have expected of seeds that are in essentials so alike,

the range of variation being again extremely small, and the material being drawn from various British localities.

Of the other forms with which I deal in this paper, I have not had the same advantage of ample supplies from different parts, but so far as they go, my results are, to the best of my knowledge and belief, correct for the material at my disposal.

Turning to *O. ericetorum* Lint., its seeds are in most respects similar to those of the Spotted Orchis, but the apical half is neither so curved nor so tapering, and the long narrow cells are not so much in evidence. On the other hand, the coils are there, but they are not always so well developed as in the Spotted Orchis, or it may be that the testa was not always completely ripe.

The kernel appears to be always about 30 per cent. longer than that of the Spotted Orchis, while the proportion of its length to its breadth is almost $1\frac{3}{4}$: 1. The testa is longer and narrower, being nearer five than four times as long as its greatest breadth.

These observations were made upon seeds from three different localities in the British Isles. Except for the measurements of the ripe kernel, the range of variation seems to be somewhat greater than in any one of the other three forms already dealt with, but it is still slight, being not more than 10 per cent. for the measurements of the testa.

I have, either rightly or wrongly, gradually come to associate coils of thickening in the testal cells with the "*maculata*" group, and, from an examination of the seeds of some other native Orchids, also, but not exclusively, with a dry habitat, and it may be that their being less pronounced in *O. ericetorum* is due to that plant growing in wet places, but this, or any other explanation, would require a great deal more investigation to justify the formation of an opinion.

While the completely ripe seeds of these two forms the Spotted Orchis and *O. ericetorum* seem to be distinguishable, they would be hard to separate if either kernel or testa were immature, but although this paper does not deal with the fruits I may perhaps add that I have found that cross-sections of the immature capsules show free wings to the ribs in *ericetorum*, whereas in the Spotted Orchis rib and valves are almost completely concrescent in fruits considerably nearer to dehiscing, but still not nearly ripe.

The only seeds that I have had of *Orchis O'Kellyi* Druce came from Ballyvaughan. Like those of *ericetorum*, they exhibit all the peculiarities which distinguish the Spotted Orchis from *O. incarnata* and *O. praetermissa*, as well as some minor ones of their own. They have beautiful coils, but they are about six times as long as broad, the length of the kernel is almost twice its breadth, and there is still less curving and tapering of the apical portion of the testa. Length and narrowness are their most striking features, and the latter is somewhat enhanced by the testa fitting closely around the kernel. The capsule is shorter than that of any other Marsh Orchis that has come under my notice without being narrower than in *ericetorum* or in the Spotted Orchis, and it agrees with the latter in the concrescence of rib and valves.

I have been fortunate in obtaining seeds of *Orchis purpurella* Steph. p. & f. from two localities. They are darker than either *praetermissa's* or *incarnata's*, both of which are, by the way, darker than any of the "*maculata*" forms that I have seen, and after being soaked in alcohol the testal cells of *purpurella* remain plainly darker than those of any of the others. They are shorter and a trifle broader than either *praetermissa's* or *incarnata's*, whereas the kernel is smaller than *praetermissa's*, but larger than *incarnata's*. The testa is almost three times as long as its greatest breadth, whereas the proportions for the kernel are not quite $1\frac{1}{2} : 1$. The testa resembles *praetermissa's* in being broadest just above the kernel, but differs from *incarnata's* in its narrow apex. The two regions, broad and narrow, are pretty abruptly defined by an indentation just above the kernel on one or both sides, the portion above the indentation being slightly curved. I could find no coils of thickening in the testal cells which have the form and the common walls of *incarnata* and *praetermissa*, the mesh being suggestive of the latter rather than of the former.

Before dealing with that prize puzzle, *Orchis latifolia* L., whatever that fearsome specific name may mean in this kingdom, I may remark that I am greatly impressed by the very small range of variation that my measurements reveal; a difference amounting to 10 per cent. in the length of the testa can be of little or no account because it means at most that the seed broke away less than a tenth of a millimetre nearer to or farther from the placenta, as the case

may have been, and this could have been done quite easily within the limits of a single cell.

For the kernel, in which there is no breaking away, I have measured seed after seed of the same form without being able to detect a difference of more than 3 or 4 per cent.

I find some satisfaction in realising that one result of this investigation has been to stamp upon my mind a pretty clear picture of the differences which distinguish the seeds of those forms that I have described. They fall into two series, "*maculata*" and "*latifolia*," and the appeal to the mental eye is enough without having to resort to micrometer measurements, which I have nevertheless made carefully for obvious reasons.

Coils of thickening and narrow common walls characterise the long narrow seeds of the "*maculata*" group, as against the absence of coils, the broader raised common walls and the proportionately broader seeds of the "*latifolia*." But while the presence or absence of coils and the narrower or broader common walls distinguish the two readily enough, the forms within each group can be separated by nothing so positive or so definite, but merely by the comparative degree of their other qualities.

In the "*maculata*" group we have Dr Druce's *Fuchsii* with its curved and tapering apex, *Orchis ericetorum* Lint. with its longer kernel and less pronounced curve, and *Orchis O'Kellyi* Druce with its long almost straight testa closely investing the narrow kernel, the apical curvature of the testa being still less in evidence.

Under "*latifolia*," I see the seeds of *incarnata* L. close meshed, short and broad, with the apical dilation of the testa and the clear margin of testal cells on either side of the kernel; those of *praetermissa* Druce longer and narrower with a looser mesh not dilated at the apex, and with the kernel almost obliterating the testal margins; and then those of *purpurella* Steph. p. & f:, which might almost be a small edition of either of the other two but for the dusky tinge of the testal cells and the abruptly pointed apex, indented at the base.

But I hesitate to confess how long it was before I could see these things in what I believe to be their true perspective; not until I had learnt how to treat the material and how to know the immaturities and abortions, due sometimes to minute parasites, from the fully

ripe seeds. Until then all appeared to me to be but confusion and chaos.

In a comparative investigation of this sort, however, the material must be mature to the very last degree, for to work with seeds at different stages of development would be merely to court disaster, and I know no way of being sure that they are at the same stage except to discard without mercy all those about the full maturity of which there is any reasonable doubt. But even so, confusion and chaos characterise that controversial conundrum in this country commonly known as *Orchis latifolia* L. I have had seeds kindly sent to me from several different places, but I can make nothing orderly out of any of them.

They conform as a whole neither to the "*maculata*" nor to the "*latifolia*" type nor yet to one of their own, the range of variation is great, and I believe that the proportion of immature and abortive seeds is greater than usual in the other forms, which may, however, be due to parasites, and does not necessarily argue physiological sterility.

In a harvesting from France most of the ripe seeds had coils, whereas in another from Chippenham most of them had none. In a third lot collected from a ring-leaved plant near Reigate it was with difficulty that I could find any seeds that satisfied me about their ripeness, but those that I selected possessed coils, whereas in another plant without rings, but with small spots, the very few seeds that I passed had no coils at all, but a few lines of thickening here and there.

The variations in size, shape and proportions, so far from being small as in the other forms, were so great even among seeds from the same plant, and so obvious as to make the taking of measurements not worth while, except perhaps for a separate investigation of each particular puzzle, which I did not attempt.

Hence, while I feel about the other six forms dealt with in this paper that a more extensive and detailed study of the seeds might possibly yield something useful to the systematic botanist, *Orchis latifolia* L. remains for the author a suggestive mystery to be solved by the experimental geneticist rather than by the morphological or the field botanist. I greatly hope that someone with the necessary knowledge and skill, patience and facilities, will take

these plants in hand, and with the help of Mendelism, will tell us what they really are, building upon the sure and certain foundations of scientifically ascertained facts, derived from the plants themselves.

NOTES ON THE BRITISH BATRACHIA.

William Harrison Pearsall.

R. trichophyllus Chaix in Villars *Hist. Pl. Dauph.* i., 335, 1786, emend. *R. divaricatus* Schrank, *Baier. Fl.* ii., 104, 1789, non Koch. *R. aquatilis*, e. *pantothrix*, Koch in Sturm. *Deutschl. Fl.* hf. 67, f. 1835. *Batrachium bipontinum* F. Schultz, in Gren. et Godr. *Fl. Fr.* i., 24, 1848. *B. trichophyllum* Van den Bosch, *Prodr. Fl. Batav.* 5, 1850. Both *R. trichophyllus* Chaix and *R. divaricatus* Schrank were founded upon the same plant—No. 1162 of Haller's *Hist. Stirp. Helv.* ii., 69, 1768. From this it is necessary to exclude Haller's var. β. which is *R. circinatus* Sibthorp (1794).

Chaix (*l.c.*) gives only, "*Ranunculus trichophyllus* (mihi) Hall. 1162: in rivulis limpidis, Valgaud. Devoluy." Haller's description (*l.c.*) is as follows:—"1162. Ranunculus caule fluitante, petiolis unifloris, foliis capillaribus, laciniis divergentibus. *Foeniculum aquaticum, tertium* Tabernaemont, p. 71. *Ranunculus trichophyllos, aquaticus, medio luteus* Column. *ecphras.* p. 315, 316. *Ranunculus aquaticus, albus, Foeniculi folio* Barrelier, ic. 566. Frequentissimus in rivulis quietis, fossisque aqua plenis. A priori 1161 differt, flore minori, foliis nulla quidem certa figura circumscriptis, multo tamen brevioribus divergentibus. Flos similis: tuba maxima.

β. *Foeniculum aquaticum, cornutum* C. B. *Prodr.* p. 73. J. B. III., p. 784. *Ranunculus aquaticus, albus, cincinnatus, tenuissime divisis foliis, floribus ex alis longis pediculis innixis* Pluknet. p. 311, t. 55, f. 2. Circa *Nidau, Erlach, Mathod*, in fossis quietis. J. B. *Genevac*, C. B. in stagnis prope *Hiltelingen*.

Priori proximus, folia habet a caule parum recedentia, omnino circulari circumscriptione terminata, lobis densissime congestis imbricatis. Nolui tamen a 1162 separare."

A study of the views of Villars' contemporaries and earlier writers makes it quite clear that his name was intended to be composite and not segregate; that *trichophyllus* and *Drouetii* were never separated; that the aggregate plant was well known to all and was the plant described by Haller, whose description after all is the real type account of the name. It is therefore evident that 1162 (= *R. trichophyllus* Chaix in Vill.) = *R. trichophyllus* Ch. in Vill. emend. Godron in Gren. et Godr. *Fl. Fr.* i., 23, 1848, and *R. Drouetii* F. Schultz (*l.c.* i., 24). In this restricted sense *R. trichophyllus* is a well marked species, but differing considerably in the size of its flowers and submerged leaves. Floating leaves very rarely, if ever, produced. Stipules $\frac{1}{2}$ to $\frac{2}{3}$ adnate, large, rounded, and usually auricled. Submerged leaves with more or less rigid and divergent segments, sub-circular in outline or bush-like, commonly short. Flowers small as a rule, but not invariably so, with non-contiguous fugacious petals—up to twice as long as the sepals—white with yellow claw. Stamens few, often about 12 (9-15 Rouy), exceeding the carpels. Receptacle usually globular, often ovoid, rarely conical—sometimes varying much in the same plant—normally hairy. Carpels more numerous than in var. *Drouetii*, often crowded and therefore laterally compressed. When quite mature and well developed the upper half of the dorsal margin forms a quadrant, and the top of the carpel is slightly convex. Under less favourable conditions the top is nearly straight or with a trifling concavity near the lateral apiculus. The carpels are normally hairy, very rarely glabrous, beaked. Fruiting peduncles short—about 2 to 5 cm.—thick, not exceeding the leaves at time of flowering but may do so slightly in fruit; most curved near the base, the rest nearly straight, not or only slightly tapering, often bifurcate at the apex with two receptacles (cf. var. *Drouetii*).

Distribution.—With a view to an ultimately complete record of the vice-comital distribution of the British Batrachia, I give herewith a list of the vice-counties from which I have seen specimens, and am very greatly indebted to Messrs W. P. Hiern, Jas. Groves, R. L. Praeger, C. Bailey, and Dr G. C. Druce for the use of their

splendid collections, and for their generous help in other directions; to Prof. Johnson for the loan of the specimens in the National Museum, Dublin, and to Mr R. S. Adamson and Mr A. J. Wilmott for original records.

R. trichophyllus Chaix:—C, 1-11, 13-41, 48, 49, 53-60, 62-64, 66, 69a, 69b, 70; (Scotland) 72, 73, 75, 76, 77, 80, 82, 83, 86, 88-90, 98-105, 107, 109-112; (Ireland) 1-19, 21-26, 28, 29, 32, 33, 35-40.

It will be noted that many of the Welsh counties and some of those in North and East of Scotland are still unrecorded.

Var. DROUETII (F. Schultz). *R. Drouetii* F. Schultz in *Archiv. Fl. Fr. et Allem.* i., 10, 1842, sine descript. Lloyd in *Ann. Société des Sciences naturelles Charente-Inférieure*, 71, 1888; in Bull. *Soc. bot. rochelaise*, 26, 1889; in *Fl. de l'Ouest* ed. 5, 6. Corbiere, *Nouvelle Fl. Normandie* 21, 1893; Rouy et Foucaud *Fl. Fr.* 69, 1893. *R. paucistamineus* Tausch. F. Schultz in *Arch. Fl. Fr. et Allem.* 10 et 51, 1842.

R. Drouetii F. Schultz was first found near Angers by J. B. Drouet and communicated by him to F. Schultz, who named it *R. Drouetii* (*Arch. Fl. Fr. et Allem.* 10, 1842, without description). Koch, to whom the plant was also sent, identified it with *R. paucistamineus* Tausch, and Schultz published this latter name in his *Fl. Gall. et Germ.* exsiccata no. 404, but afterwards rectified it when Koch discovered that the plant differed from *R. paucistamineus*. This explains why Drouet has given in the *Arch. Fl. Fr. et Allem.* p. 51 the following description of *R. Drouetii* under the name *R. paucistamineus* Tausch. Description of *R. paucistamineus* Tausch by J. B. Drouet (*loc. cit.*):—" Tiges charnues, flottantes ou submergées, arrondies ou légèrement anguleuses, rameuses, allongées. Pétioles 3-fides, puis découpés en filaments nombreux, capillaires, mollement divergents; les supérieurs auriculés à la base. Pédoncules atteignant à peine ou dépassant peu les feuilles, réfléchis à la maturité. Fleurs petites (5-10 mm.), à pétales obovales, à peu près doubles des sépales glabres. Etamines 5-10, atteignant à peine ou dépassant peu les carpelles; stigmates falciformes. Carpels 5.25, petits, ovales-globuleux, brièvement ailés des deux côtés dans leur moitié inférieure, glabres jeunes, finement chagrinés luisants, murs, légèrement ridés trans-

versalement, à bec très grêle ou nul. Réceptacle ovale ou un peu conique hérissé, soyeux."

The original description of *R. paucistamineus* by Tausch in *Flora* vol. xvii., ii., 525, 1834, is much too vague—"Batrachium; caule abbreviato natante, foliis omnibus immersis petiolatis capillaceo-multifidis, floribus minimis sub-12-andris oligocarpis, carpellis hispidulis obtusis."—but an examination of authentic foreign examples (and particularly those in Hb. Paris, for which I am indebted to Mr Jas. Groves) shows that *R. paucistamineus* Tausch is not synonymous with *R. Drouetii* F. Sch., but an aggregate species of much wider range—including *Drouetii*, *trichophyllus*, and even large forms of our var. *submersus* so long as the flowers are not too large.

In *Bull. Soc. Bot. Fr.* vol. 57, xxxv., 1910, M. Félix—the eminent French authority on the Batrachia—points out that the descriptions of *R. Drouetii* by Godron, Boreau, Du Mortier, etc., are much better known than Drouet's own description hidden in the *Archives Fl. Fr. et Allem.*, and attributed to an entirely different plant than *R. Drouetii*. It is from these varying descriptions that botanists have been trying to obtain a correct idea of Drouet's plant, and it is not to be wondered at that they have not succeeded. It has been left for Lloyd—*Fl. de l'Ouest* ed. 5, 6: *Ann. des sciences naturelles de la Char.-Inf.*, 71, 1888, et *Bull. Soc. bot. rochelaise* 26, 1889—to show the differences between *R. Drouetii* and *R. trichophyllus* and to fix, within the narrowest limits, the distinctive characters of the true *R. Drouetii* as authenticated by Drouet himself.

"*R. Drouetii* Schultz, exsicc. no. 404, Boreau, *Fl. du Centre*. Très voisin du *R. trichophyllus*, il en diffère surtout par les carpelles moins nombreux, glabres, lâches, c'est-à-dire espacés de manière que la moitié supérieure du carp. qui est renflée-arrondie, est tout à fait dégagée, tandis que dans *R. trichophyllus*, ils sont velus, serrés, comprimés, un peu aigus et imbriqués de manière à laisser voir seulement le côté extérieur du carpelle. Cette disposition donne à la tête de fruits un aspect différent, facile à distinguer. Les stigmates sont aussi plus étroits, en languette; dans *R. trichophyllus* ils approchent de l'ovale. Mêmes lieux que le précédent, auquel il est quelquefois mêlé, moins commun.

Obsv.—Plusieurs caractères auxquels les auteurs attachent de

l'importance sont variables, ainsi : notre *R. Drouetii* n'est pas plus grêle d'un vert plus clair que l'autre, ses feuilles sont raides ou flasques selon la nature de l'eau, leur profondeur, leur situation ombragée ou non, les fleurs des deux espèces n'offrent pas de différence appréciable." (Lloyd, *loc. cit.*).

I have given the foregoing extracts at some length as they settle many points upon which both British and Continental botanists have been in doubt. It is clear that Drouet's plant possessed glabrous carpels, but unfortunately the term " glabrous " has been so loosely used by some writers that we are often not quite certain whether to understand it relatively or absolutely. However, the context makes it quite obvious that MM. Drouet, Felix and Lloyd intend the word to be used absolutely. In my own case it is always used in the same sense, and, on the contrary, if there are even a few hairs, the fact is stated.

Var. *Drouetii* is often difficult to separate from some forms of *R. trichophyllus*—as our past reports show. This is especially the case when dealing with robust specimens, for while the majority of British plants lack the rigid habit of that species and are relatively more slender, others are large and stout. Little reliance can be placed upon colour in separating these plants, although *Drouetii* growing in clear water is usually lighter green than *trichophyllus* under similar conditions, but it may be dull greyish-green, often olive, or even madder (in peat). There are no floating leaves. The submerged leaves are normally sessile or sub-sessile—upper often distinctly petiolate—with segments weak and collapsing or " feebly divergent" when taken out of the water. (Mr James Groves informs me that in Drouet's original specimen (Hb. Paris) the segments are distinctly diverging.). This character is often masked by incrustations of lime, mud or slime; and varies, too, with age. Upper stipules much adnate, often large and auricled. Flowers rather small, but seldom as small as those of *trichophyllus*; usually the narrow oboval petals are about twice the dark glabrous sepals. Stamens few—often about 10—variable in length, sometimes not exceeding the head of carpels. Receptacle usually oval or conical, longer than broad, invariably hispid. Fruiting peduncles relatively slender, short, normally not exceeding the leaves, sometimes bifurcated at the apex, with two receptacles. Carpels slightly less numer-

ous and more stubby than in *trichophyllus*, oval or oboval, inflated upward, much rounded at the summit, normally glabrous or with a few hairs, occasionally with many.

DISTRIBUTION.—C, 1-17, 19-30, 32-39, 41, 49-52, 54-71; (Scotland) 73-76, 79, 82, 83, 86, 88-90, 95-106, 108-111; (Ireland) 2, 12, 16, 18, 19, 21, 23, 26, 27, 31.

Var. RADIANS (Revel), in *Act. Soc. Linn. Bordeaux*, xix., 120, fig. 1, 1853. The original description is :—" Caule fistuloso ramoso natante. Foliis submersis petiolatis multifidis laciniis capillaribus divergentibus, flaccidis, fluitantibus rotundato-orbiculatis, profundè divisis, infernè pilosis, cum segmentis radiantibus, primùm dentato-lobatis, deindè, plantâ ætatem adultam adeptâ, laciniatis et tunc plerumque petiolulatis. Petiolis basi dilatatis, in vaginam membranaceam pilosam adhærentem plus minus auriculatam abeuntibus. Pedunculis foliis brevioribus vel subæqualibus. Calice patente. Petalis obovato-cuneatis calice duptò circiter longioribus, albis, ad unquem flavis. Staminibus sub-18 ovariorum capitulo longioribus. Carpellis numerosis transversè rugosis plus minus apice (infernè tantum) hirtis, lateraliter compressis, obovatis, cum carinâ inferiore-valdè convexâ, superiore verò basin versùs depressiusculâ, versus autum rostellum convexâ, rugis ad depressionem convergentibus; rostello mediocri, crasso, obliquè adscendente, paulò suprà extremitatem externam diametri longioris fructûs inserto. Receptaculo sphærico densè setoso."

" Tige fistuleuse, rameuse, nageante. Feuilles submergées pétiolées, multifides, à laciniures capillaires divergentes molles, les flottantes arrondies circulaires, profondément divisés, poilues en dessous, à segments rayonnants, d'abord dentés-lobés, ensuite, dès que la plante est arrivée a l'état adulte, laciniés, et dans cet état ordinairement pétiolulés. Pétioles dilatées à la base en une gaine membraneuse, adhérente, velue, plus ou moins auriculée. Pédoncules plus courts que les feuilles ou les égalant à peine. Calice étalé. Pétales obovates cunéiformes, égalant deux fois environ la longueur du calice, blancs à onglet jaune. Etamines (15 à 18), plus longues que la capitule formé par les ovaires. Carpelles nombreux, ridés transversalement, plus ou moins velus au sommet en dessous, latéralement comprimés, obovales, à carène inférieure très convexe, la supérieure un peu déprimée vers la base et convexe dans la partie

qui avoisine le style; rides convergeant vers la dépression. Bec médiocre, épais, obliquement inséré un peu au-dessus de l'extrémité extérieure du grand diamètre. Réceptacle sphérique, hérissé de poils épais." (Revel, *op. cit.*).

Later, Revel amended this description in his *Renonc. de la Gironde*, 8 et icone—and cited by A. Boreau in his *Flore du Centre de la France* ed. 3, ii., 11, 1857. In this he described the segments of the subm. ls as " divergentes en circle "—a character well shown in some British specimens. In his *Flore du Sud-Ouest*, Revel further modified his opinion of the receptacle, which is there described as " ovoid." In my own experience this is the more common form, but it is remarkable how often—even on the same plant, the receptacle is nearly spherical or—on the other hand—distinctly longer than broad (cf. also *R. trichophyllus*).

R. radians Revel was first recorded as a British plant by Mr W. P. Hiern at the annual meeting of the British Association in September 1865. His plants were gathered in June 1864 at Silverdale, W. Lancs, and among his MSS. is a letter from A. Boreau (6/7/1865) having reference to one of these plants. Of this Boreau says " the foliage is absolutely the same as that of a plant I possses so named by Revel himself." So far as my own examination of authentic continental specimens goes, it confirms the claim of Mr Hiern for *R. radians* as a British plant. Babington (*Manual* ed. 9, 6) and Hooker (*Stud. Fl.* ed. 3, 6) considered the plant a form of *R. trichophyllus* with floating leaves. Moss (*Journ. Bot.* lii., 117, 1914) follows Rouy and other Continental botanists in giving it varietal rank. At present I accept this view, but the more specimens I examine, the more I lean to the opinion so forcibly expressed by M. Felix in his Monograph on the Batrachia—*Bull. Soc. Bot. France*, vol. 60, p. 260—that *R. trichophyllus* never possesses floating leaves and that *R. radians* is a distinct species. He says, " *R. trichophyllus* only possesses capillary leaves. Never—and I insist on the word—never have I seen it, either living or in herbaria, with floating leaves." At any rate, all the British forms of the so-called *R. trichophyllus* with floating leaves which I have examined are without difficulty referred to var. *radians* (Revel), var. *triphyllus* (Hiern), or *R. heterophyllus* Weber. I entirely dissent from the view (*Camb. Brit. Fl.* vol. iii.) that it is possible to include under

R. trichophyllus what British botanists now accept as *R. heterophyllus* and *R. penicillatus*—forms which differ not in degree but in kind from *R. trichophyllus*.

A large plant having the facies of robust *R. trichophyllus*. All leaves are usually ± circular in outline, symmetrical in segment and regular in arrangement—a beautiful plant when carefully dried. Floating leaves rather thick, coriaceous, often hairy beneath and on the petioles; normally sub-circular, deeply divided into cuneate segments separated by radiant straight-sided sinuses, often extremely narrow, rarely very wide; basal sinus large and deep or narrow as the others. Occasionally they are reniform, tripartite, or even fan-shaped, having segments laciniate and petioled, or transitional. Submerged leaves usually dark-coloured, sub-circular in outline, regularly disposed, with short, ± rigid, diverging segments like those of *R. trichophyllus*; smaller than in var. *triphyllus*, more compact and much more uniform in shape and arrangement. Not "commonly petiolate" but often nearly sessile, the petiole being shorter than its stipule. Occasionally, when submerged leaves are developed to the summit of the stem—in place of floral leaves—they are longly petiolate. Flowers medium-sized, much larger than those of *R. trichophyllus* and approximating to those of *R. heterophyllus* Weber. Fruiting peduncles usually very short (upper often about 2 cm. with lower longer), much shorter than the floating leaves they may subtend—occasionally nearly equalling them—rigid, strongly recurved below, nearly straight above, often at right angles to the stem. Receptacles spherical or ovoid, densely hairy with long hairs. The young carpels taper upward—both the dorsal and ventral margins being slightly concave—giving the upper part a "bottle-neck" appearance. This largely disappears in mature fruit, but the dorsal margin usually retains a slight depression at the top which causes the carpel to be "narrowed above," and so readily distinguished from that of *trichophyllus*. "The carpels are ± numerous—reduced to 8 or 10 in certain forms. The depression in the upper keel is nearly insensible when their number diminishes." (M. Felix, *Bull. Soc. Bot. Fr.* vol. 60, 1913.). In this country invariably hairy, but a glabrous form has been found in France.

Distribution.—I have seen specimens from the following coun-

ties or vice-counties :—England, 5, 6, 9-11, 12, 13-17, 20-24, 26-29, 31, 33, 34, 36-41, 50, 51, 55-58, 60, 69b. Scotland, 75-77, 80, 81, 85, 86, 89, 90, 97-105, 110. Ireland, 1, 16, 18, 21, 23, 26, 31, 34, 39.

Typical specimens are those from (1) Silverdale. W. Lancs, 15/6/65, W. P. Hiern, (2) Thame, Oxon, May 1915 [Ref. O. 815], G. C. Druce, (3) Nailsea Moor, N. Somerset, 19/6/1900, and (4) Marsh ditches, Yatton, N. Somerset, 13/6/1900, J. W. White, (5) Quarry pool, Wickwar, W. Gloster, May 1915, J. W. White. See *Rep. B.E.C.* 311, 1915. Mr White subsequently sent me representative sheets which left no doubt as to the identity of this plant.

f. GODRONII, nov. comb. *R. Godronii* Grenier, in F. Schultz *Arch.* 172, 1850, name only. Form 19, *Godronii* Hiern, *l.c.* 1871. The adoption of this name is unfortunate, as having been first published without description and subsequently abandoned by Grenier himself in favour of *trichophyllus*. In my opinion, however, the plant seems much nearer to var. *radians* than to either *R. trichophyllus* or var. *Drouetii*, under each of which it has been placed. In many cases it is difficult to separate from var. *radians* except by its less robust habit and weaker submerged leaves, and appears to be best regarded as a slender form of that variety. Boreau, *op. cit.* puts it under *R. radians* and notes the following differences, "Le *R.* (*Batrachium*) *Godronii*, me semble différer par des proportions plus grêles, les fleurs moitié plus petites, les carpelles moins nombreux, à carène plus amincie." Floating leaves when well developed nearly circular, but less regularly divided and usually smaller than those of *radians*. More often, however, they are somewhat semicircular in outline and truncate at the base, or with stalked and variously fissile fan-like segments. The submerged leaves may have either weak and sub-collapsing, or rigid and divergent segments. In the latter case they are always more irregular in form and arrangement than in *radians*. Usually ± petiolate and often having segments distinctly flattened and linear. Peduncles shorter than, or about equalling, the leaves, slender, often narrowed above. Receptacle ± rounded (occasionally rather long), and hairy. Carpels hairy as a rule, or nearly glabrous, often narrowed above. Flowers commonly small with petals up to 6-7 mm., thin in texture, faintly veined. Typical specimens were distributed by Miss I. M.

Roper from Farnborough Common, Marksbury, N. Somerset, 20th May 1918, through the *W.B.E.C.*

DISTRIBUTION.—England and Scotland:—4, 6, 10, 15, 17, 20, 21, 25, 29, 30, 34, 36, 38, 39 (unrecorded from Wales), 56, 58, 62-64, 75-77, 80, 86, 90, 97-105, 110, 111 (cf. with *radians*). Ireland:—**5, 19, 23.**

R. TRIPARTITUS DC. Icon. Pl. Gall. Rar. i., 15, t. 49, 1808. *R. tripartitus*, a. *micranthus* DC. Regn. Veg. Syst. Nat. i., 234, 1818. *Batr. tripartitum* S. F. Gray, Nat. Arr. Br. Pl. 2, 721, 1821. *R. hydrocharis*, *A. heterophyllus*, γ. *tripartitus* Spenn. Fl. Frib. 1829.

The name *tripartitus* has been given to at least 5 different plants, (1) *R. tripartitus* DC. (2) *R. tripartitus* Auct. Brit. = *R. lutarius* Bouvet = *R. intermedius* Bab. non Knaf. (3) *R. tripartitus* var. *obtusiflorus* DC. = *R. tripartitus* Nolte (both cited by Koch as synonyms of *R. Petiveri*) = *R. Baudotii* (Godron ampl.) Syme E. B. i., 24, 1863. (4) *R. aquatilis* var. *tripartitus* Koch Syn. ii., 1835 = *R. Petiveri* var. *major* Koch Syn. iii., 10, 1843 = *R. triphyllos* Wallr. (5) *R. tripartitus* Dubourg d'Iisigny = *R. Lenormandi* F. Schultz.

A rare and critical species. Stem 1-5 dm., extremely slender, but comparatively strong, simple or slightly branched. Floating leaves bright green and shining when fresh, forming a rosette on the surface of the water, and readily distinguished by their colour from those of *R. lutarius*. When dried they become either yellowish (or brownish)-green. Small—often extremely so—symmetrical, with long (3-5 cm.), and very slender petioles; deeply and regularly divided into 3 cuneiform segments separated by relatively wide sinuses with nearly straight sides. Segments very regular in outline—with 3 or 4 rounded crenatures—central segment usually as long as the lateral and only slightly smaller, with 3 rounded crenatures, or, in very small leaves, entire. Submerged leaves few, distant, extremely slender; when normally developed having remarkably fine, truly capillary, segments—yet usually ± divergent, but sometimes completely collapsing. Stipules well-marked, often conspicuous, delicate, transparent, with large auricles; upper with free or nearly free rounded ends. Flowers minute and inconspicuous. Petals minute (3 mm.) oblong, rather acute at the apex,

equalling or scarcely exceeding the calyx, very fugacious. Fruiting peduncles very slender, usually shorter than or equalling the leaves, not or slightly tapering, ultimately recurved. Receptacle very small, roundish, hairy. Carpels few, obovate; when mature and well-developed most inflated at the top and often having the small lateral mucro below the summit of the carpel. More frequently, however—especially in specimens gathered too early—the carpels are most inflated in the middle and slightly narrowed at the tip; very rugose, glabrous and sometimes sub-petiolate

DISTRIBUTION.—In England only from W. Cornwall (1), E. Cornwall (2), and S. Devon (3). In Ireland only from Co. Cork.

I have seen the following authentic specimens:—(Hb. Groves)—W. Cornwall, Mullion, J. Cunnack, 1879, E. Cornwall, Innes Moor, near Roche, R. V. Tellam, 1876; near Wadebridge, Clement Reid and Dr Vigurs, 1906. Co. Cork, Baltimore, R. A. Phillips, 1896.

(Hb. Hiern)—E. Cornwall, Innes Moor, near Roche, R. V. Tellam, June 1877. W. Cornwall, Kynance Down, The Lizard, Miss R. E. Carr Smith, 30th May 1910. S. Devon, Knighton Heath, Hennock parish, Miss C. Ethelinda Larter, F.L.S., 9th May 1914; and from same station, W. P. Hiern, M.A., 29th April 1916.

(Hb. Barton)—E. Cornwall, ditch at Castle Killibury, Wadebridge, C. C. Vigurs, 19.6.07. Miss C. E. Larter very kindly sent me fresh specimens from the S. Devon station in May 1920.

R. LUTARIUS Bouvet in Bull. Soc. Angers for 1873, 96, 1874. *R. tripartitus* Auct. Brit. *R. lutarius* Bouvet, fide H. & J. Groves in Journ Bot. xlv., 452, 1907. Form *intermedius* (Hiern) in Journ. Bot. ix., 67, 1871, excl. syn. Knaf. *Batr. intermedium* Nyman Syll. Fl. Europ. 175, 1854-5. *Batr. lutarium* Revel in Act. Soc. Linn. Bordeaux xxv., 413, t. 4, 1865. *R. intermedius* Bab. Man. ed. viii. *R. lutarius* (Bouv.) Bab. Man. ed. ix., 1904 (H. & J. Groves). Revel's description (*l.c.*) is as follows:—" Tige fistuleuse, rameuse, rampante, vivant dans le limon, radicante, attachée au sol par de longues fibrilles radicales, opposées aux feuilles, celles-ci toutes reniformes, au peu arrondies orbiculaires, émarginées, presque jusqu'au milieu, à bords de l'échancrure tantot éloignés tantot rapprochés et presque contigus, lobés à 3-5 lobes crénelés, ordinairement non contigus à la base; surface inférieure des feuilles

parsemmé de quelque poils apprimés, ou glabres; petioles dilatés à la base en une gaîne membraneuse, adhérente, auriculée, inserés en dessous des feuilles, à la base de l'échancrure; pédoncules plus courts que les feuilles, ou les égalent à peine; sépales obtus, scarieux, étalés; pétales obovales en cous, egalant deux fois et demi environ la longuer du calice, blancs à onglet jaune; carpelles nombreux, ridés transversalement, latéralement un peu comprimés, obovales, à carène inférieure très convexe, la supérieure presque droite, un peu convexe dans la partie qui avoisine le bec; rides sinueuses, brisées, un peu courbées, bec médiocre, obliquement ascendant, recourbé à partir du milieu mais ordinairement écourté par le milieu à la maturité des carpelles, inséré au peu au-dessus de l'extrémité du grand diamètre; réceptacle sphérique, herissé de poils. Mai, Juin. Terrain limoneux.

Obsv.—La présence des poils que l'on remarque quelquefois sur les sépales, sur les pédoncules, sur les pétioles et sur leurs oreillettes, ne m'a pas paru assez constante pour an faire mention."

In the *Cambridge Flora* vol. iii., Dr Moss includes *R. lutarius* (? Bouvet *loc. cit.*) = *B. lutarium* Revel (1865), under *R. tripartitus* DC. He admits (*Journ Bot.* iii., 116, 1914) that he has seen no authentic specimen of Revel's plant, and from other indications it is apparent that he is unacquainted with it. Moreover, it is difficult to understand why he should query the author's name. In *Journ. Bot.* xxxviii., 135, 1900, Messrs H. & J. Groves say, " We are indebted to Herr Freyn for suggesting the identity of the British plants with *B. lutarium* Revel, described and figured in *Act. Soc. Linn. Bord.* 1865 (p. 413, pl. 4). We have compared them with specimens of *B. lutarium* from the original locality (La Teste, Gironde), and we feel satisfied that they are the same. Revel's species was, as far as we have ascertained, first placed in *Ranunculus* by M. Georges Bouvet, and M. Bouvet has kindly given us the reference to the original publication of the name in *Bull. Soc. d'Etudes scient. d'Angers* for 1873 (1874) p. 96." The name, therefore, should stand, and as the plant is, in my judgment, quite distinct in character and distribution from *R. tripartitus* DC., it is entitled to the specific rank originally accorded it.

A much more robust plant than the preceding. Stem fistular, usually much branched, glabrous except at the nodes and rooting

at the lower of these. Floating leaves resembling those of *R. tripartitus* DC., but larger (up to 1 inch wide), reniform or three-fourths circular, less deeply divided into broader segments having markedly rounded edges. Segments 3, large, symmetrical, cuneate-obovate, central usually only slightly less than the lateral, broad at the top (with 3 nearly semi-circular crenatures), narrowed below. Each lateral segment (usually with 4 similar crenatures) separated from the central by a narrow sinus. Lower surfaces sparsely covered with adpressed hairs, or glabrous. Submerged leaves commonly absent, rarely present, then few in number, less frequently forked and having rigid segments distinctly flattened, of an appreciable width and ± diverging. Usually there are some transitional leaves present also, and these I have not seen in *R. tripartitus*. Stipules large, well-developed and conspicuous. Flowers very small for so robust a plant, with small, narrow oboval petals, up to 2ce the sepals, when well-developed 6 mm. long, but usually less. The colour of the petals is white—often pinkish when dried—with yellow base. If held up to the light and looked through they often appear nearly "wholly white," and may be mistaken for those of *R. ololeucos*, but placed upon absolutely white paper and seen by reflected light, the yellow tinge of the lower portion is at once apparent. Stamens very few (6-10) about equalling the head of carpels. Fruiting peduncles usually much shorter than the leaves, ultimately recurved. Receptacle more or less hairy. Carpels fairly numerous, unequally obovate, much inflated above, regularly and strongly wrinkled transversely, keeled, with a prominent terminal beak (lateral or nearly central); glabrous.

DISTRIBUTION.—In England from all the counties south of a line joining Bristol Channel and the Thames estuary—excepting Somerset and I. of Wight—*i.e.*, 1-4, 7, 8, 9, 11, 14, 15, 16, 17. In Wales, from Glamorgan 41, Brecknock 42, Pembroke 45, and Anglesea 52.

MISCELLANEOUS NOTES.

"ALPINE FLOWERS FOR SNOWDON. A large tract of land on the Llanberis, Carnarvonshire, side of Mount Snowdon, has been planted with Alpine plants and seeds. 'The experiment,' said Mr T. R. Bulley, 'is to be continued every year until the greater part of Snowdon is covered with Alpine flowers. It is to be hoped that tourists will help us by not tampering with them.' Chinese rhododendrons are to be planted on the slopes of Snowdon next spring." The above notice recently appeared in a newspaper. Assuming that this appalling act of vandalism has been perpetrated which must shock every British field botanist and student of phyto-geography, we implore the misguided enthusiast to stay his hand and, at once, assuming he has any knowledge of the seeds or plants he has put there, to furnish a complete list of them so that the mischievous act may, as far as possible, be lessened in its evil consequences. Doubtless Mr Bulley is unaware of the harm he has done. Snowdon is a splendid area, hitherto free from adventive species, and although much visited its flora is as yet not perfectly known as is evinced by the comparatively recent discovery on it of *Euphrasia hirtella*. In the future any new plant found in its area will have its indigenity doubted through this stupid interference with nature. The recent discovery of *Aquilegia alpina* in Caenlochan Glen, Forfarshire, is robbed of its possible value because some florist years ago acknowledged he had sown seeds of alpines there. This prevented myself and others for years from exploring its splendid cliffs, which may hide some unrecorded species. Surely the keepers of the London parks could find a place for this superfluous energy, and there are grounds at Hanwell and similar establishments, not to speak of sea-cliffs at Bournemouth or Torquay already planted with exotics, where these additions, which are absolutely out of place on a British mountain, might find a more or less temporary home.

NATIONAL TRUST FOR PLACES OF HISTORIC INTEREST OR NATURAL BEAUTY. Report 1920-21, 25 Victoria Street, Westminster. This splendid Society has acquired the option of purchase of Friar's Crag, Derwentwater, and about 8 acres of Scarf Close Bay for the sum of £2300 as a memorial to Canon Rawnsley. Cissbury Ring, for

which £2000 is still required, it is to be hoped may also be secured. Miss Chichester has given an additional 97 acres at Morte Point in memory of her parents, the late Sir Alexander and Lady Chichester. A field at Mount Pleasant, near Clovelly, has been given by Mrs Hamlyn in memory of the men at Clovelly who fell in the great war. The common rights of Witley Common, Surrey, an area of 240 acres. have been presented by Mr Thackeray Turner and his daughter The Cerne Giant, near Cerne Abbas, Dorset, has been given by M. Pitt-Rivers. Gover Hill, Kent, has been presented by Sir William Geary, and Stoke Poges, Bucks, where there is a monument to Gray, and some acres of adjoining land, are to be handed over by Sir B. Oppenheimer and Mr W. A. Judd. Some additional land at Waggoner's Wells, Haslemere, has been presented by Mrs Vertue. A bequest by Miss Theodora Powell of £5000 enabled the Trust to complete the purchase of Eastbury Manor House, near Barking.

The inaugural meeting of the Indian Botanical Society was held in January 1921 under the historic Banyan Tree in the Calcutta Botanic Garden. Eighty-one original members were enrolled, the President being Dr Winfield Dudgeon.

Ken Wood. This beautiful estate of Lord Mansfield at Hampstead has been offered for sale at £340,000. It comprises about 220 acres and includes the fine mansion. To botanists the grounds have a great attraction for the May Lily, *Unifolium bifolium* has been naturalised there for many years, and *Anemone apennina* is semi-wild.

Burnham Beeches. About 70 acres of woodland adjoining this favourite piece of ground has been recently presented by Lord Burnham.

Thomas Carew Hunt, Consul at the Azores. H. C. Watson, in Godman's *Natural History of the Azores* p. 117, says, "The zealous and intelligent exertions of Mr Hunt in the years 1844-48 conduced much to the increase and to the diffusion of knowledge about the Botany of the Isles. He most kindly collected for me, and for the (then flourishing, since extinct) Botanical Society of London, a very large supply of Azores plants, chiefly from the island of his own

residence, San Miguel, thus excellently supplementing my own unsatisfactory collection by the number and goodness of his own specimens. . . . These specimens were promptly distributed into British, European, and American Herbaria. Their labels were filled in by my own pen and all bear the same numbers on them and the same names with few exceptions . . . as had been used on my earlier labels. Mr Hunt's added species, of course, would have no corresponding number; they usually bear the abbreviation 'Add.' instead.'' Some corrections were made in or about 1848. The later labels are more to be trusted as to the identifications than the earlier labels of 1843 or of Hunt's in 1844 or 1845. Since the issue of the supplementary list several additional species have been sent by Mr Hunt, who has himself published some botanical account of the Isles in the *Journal of the Geographical Society of London* in 1845. Watson says Mr Carew Hunt went from the Azores to Stockholm. Thus it will be seen Carew Hunt gave plants to our forerunners, the Botanical Society of London, for distribution, and that H. C. Watson sent them to the members. At the meeting of the Society, July 7, 1848, a number of plants presented by T. Carew Hunt was announced as containing eight species not previously ascertained to grow in the Azores, and on November 3 of the same year he sent a box containing, among other plants, four new species including a very handsome *Vicia*. In the *Gardeners' Chronicle* 119, 1921, an account is given of the discovery of an interesting Herbarium which was found in the city warehouse of Messrs Joseph Barber & Co., of the Minories. The case containing it had been originally consigned to the Botanical Society of London. Attached to it was a label giving the name of the collector, Mr Carew Hunt, the name and place of finding the plants, and the date of its collection, 1834. The case was offered to the Royal Botanic Society, an entirely different body to the Botanical Society of London to which it was consigned so long ago as 1834. The collection was then, by the advice of the Committee, offered to Kew, where it was warmly welcomed by Colonel Sir David Prain. It is somewhat remarkable that a herbarium of so old a date should have remained unnoticed and undamaged in a London warehouse. Some of the plants recorded by Hunt await rediscovery. On my visit to the Isles in 1909 I refound, among others, *Trifolium angustifolium* and *Urospermum Picroides* at Ponta Del-

gada, and *Tillaea muscosa*, which had escaped the notice even of the local botanist, Dr Carreiro. I saw it not only at Ponta Delgada, but in the Furnas and at the Sete Cidades. The beautiful Vetch alluded to at the meeting of the London Botanical Society was named by H. C. Watson after its secretary *Vicia Dennesiana*, an endemic species.

BOOKS IN PREPARATION.

THE FLORA OF CORNWALL, under the auspices of Mr E. THURSTON, C.I.E., with the additions to Davey's *Flora*, we are pleased to hear, will shortly be issued.

THE FLORA OF SURREY, by Mr C. E. SALMON, will, it is to be hoped, appear in the near future.

THE FLORA OF BUCKINGHAMSHIRE, by Dr G. CLARIDGE DRUCE, is in the press, and will be published by Messrs T. Buncle & Co.

BRITISH FLOWERING PLANTS. Another volume, with paintings by Mrs Perrin, F.L.S., is in preparation.

WILD FLOWERS OF THE BRITISH ISLES, by Mrs I. ADAMS, F.L.S. A third volume of this attractive work is contemplated at no distant date.

SUPPLEMENT TO REPORT OF BOTANICAL SOCIETY AND EXCHANGE CLUB FOR 1921.

FLORA ZETLANDICA.

BY

G. CLARIDGE DRUCE, M.A., LL.D.

PREFACE.

This remote group forms a northern archipelago of more than a hundred islands, of which nearly thirty are inhabited. It lies between the latitudes of 59.51 degs. and 60.50 degs., and from 1.15 degs. to 45.30 degs. longitude, having a land area of about 1475 square kilometres. Only about a twentieth part is under cultivation. The largest island, The Mainland, is about 60 miles long from Sumburgh Head in the south to Feddaland in the north, but is so narrowed near Sullum Voe as to be almost severed. The islands are about 70 miles from the most northern of the Orkneys, 130 miles from Cape Wrath, and 220 miles from the Faroes, with which they have much in common. The Faroes have about 17 inhabited islands, which stretch from north to south about 90 miles. Their land surface is nearly the same as that of Shetland, being about 1325 square kilometres. They differ much in the geological structure as basalt is largely present in the Faroes, and their hills are higher. Slattaratind on Ostero reaches nearly 2700 feet, as against Ronas Voe in Shetland, which is less than 1500 feet, and there are many hills about 2500 feet. That may, in part, account for the presence of some Saxifrages, Sedges, and Alpines which are unknown in the Zetlands.

The question arises :—How did the existing vegetation of these groups of islands, situated as they are at such a distance from the

mainland of Scotland and Scandinavia, reach them after the glacial period? Various theories have been formulated, but the two which have obtained most favour are—(1) The existence of a post-glacial land-bridge from the mainland. Dr Ostenfeld has most ably presented this, but it has not received the universal support of geologists; and (2) that of immigration by means of birds, ocean currents, and wind. The latter, with modifications, has been ably urged by Dr Warming (*Botany of the Faroes* 660-681). In favour of this is the very restricted distribution of many species in both groups. Doubtless, as compared with the oceanic groups of the Azores, Madeira, and the Canaries, which were out of reach of glaciation and which are rich in endemic species, these northern groups have a much more recent flora as is evidenced by the few instances of endemism which they afford, except in the micro-species of Hieracia. Doubtless at one time the land-surfaces of the Zetlands and Faroes were more extensive, as the winds and waves have taken a heavy toll, but there is no evidence of a post-glacial land union. Neither toads nor reptiles are found in the Faroes, that also being an argument which tells against the existence of a land-bridge. Warming instances the volcanic island, Jan Mayen, which is separated from Greenland by 450 kilometres, from Iceland by 550 kilometres, and from Spitzbergen by 965 kilometres, and is surrounded on all sides by a very deep sea (1000-2000 fathoms), and yet it has been occupied by a small number of species having a wide arctic distribution, and these must have been conveyed across greater distances of sea than those which separate the Faroes and the Zetlands from the mainland of Scandinavia and Britain. The Azores and Krakatoa offer similar examples, and Warming alludes to the occurrence of the North American *Eriocaulon* in the West of Ireland and Skye. He places little stress on bird-conveyance as a means of transport, but I think he minimises its effects. In what other way could *Elodea* have spread with so great rapidity through Britain even into remote ponds and tarns? Warming shows that wind has transported *Calluna* seeds across the Kattegat, a distance of 120 kilometres, and Meunier records that fragments of chalk were blown by the wind for a distance of at least 150 kilometres near Paris. There is, however, a still more important factor in the introduction into both

groups of islands of plants from the mainland—that of man and his operations. A very large percentage of species in the Zetlands are due to this cause. We need only allude to plants which in Britain are assumed to be native, such as *Ranunculus Ficaria*, *R. repens*, *Bursa pastoris*, *Raphanus Raphanistrum*, *Spergula sativa*, *Hypochoeris radicata*, *Senecio Jacobaea*, *Myosotis arvensis*, *Lycopsis*, *Phleum pratense*, *Arrhenatherum tuberosum*, etc. In reference to this I may add that the specimens of Shepherd's Purse which I collected in two or three localities in Shetland and Unst presented no appearance of endemism but were easily referred by Dr Almquist to *anglica* and *belgica*, and were doubtless brought in by man. The solitary patch of Water Cress and the colony of *Crepis capillaris* are almost certainly recent introductions, and we see how the American *Matricaria suaveolens* and *Mimulus* have spread. That many plants when once introduced do not spread more rapidly is due to the fact that the short summer with its low temperature does not allow the fruiting processes to be completed. I was again and again told that the seasons are now more severe than in olden times, and that formerly more fruit was observed on *Vaccinium Myrtillus* and *Empetrum* than is now the case. *Pyrus Aucuparia* now rarely flowers. Warming thus summarises his views :—Taking everything into consideration, I am fully convinced that the whole of the Faroe flora—at least all the more highly organised land plants—have immigrated after the glacial period across the sea, and from the nearest countries, lying east, especially Great Britain. If this be true of the Faroes it must be still more applicable to the Shetlands, which, with the exception of a hybrid Pondweed, of a recently segregated *Rhinanthus*, of a few critical *Hieracia*, and the *Plantago Edmondstonii*, now described, possess no species which is not found on the mainland. In passing one may add that the mean rainfall, about 43 inches (much less, indeed scarcely half that of the Faroes), is misleading since the clouds are absent from the sky only on a few days of the year, that mists are very frequent, and therefore there is great humidity, and the solar light is of feeble intensity. The larger size of the flowers of many Shetland plants has been attributed to the length of daylight. May not its comparative obscurity be an influencing means? That the size or brilliancy of the flowers is due to the desire to attract insect

visitors can hardly be urged since there are few lepidoptera, and many plants are self-fertilised, and others never ripen seed. The true cause of this exceptional size of the flowers in the case, among others, of *Lathyrus pratensis*, *Vicia Cracca*, *Trifolium repens*, *Lotus corniculatus*, and *Senecio aquaticus* has yet to be ascertained, and help may be given by the bio-chemist. Their size may, in part, be due to the angle of incidence of sunlight, but it occurs not only in the case of upland but also with coastal plants. Another fact in connection with Zetland is the comparative paucity of annual species. There seems to be a tendency for an annual species to extend its life duration so that *Poa annua* may be seen as a perennial. The weather of the islands is bad—rain, mist, and wind occurring in continual cycles. In the Faroes the cloudless days in a year are only 6, while the sky is overcast on 178. Rain falls on 279, and there are only 11 days of calm. The Zetlands have a slightly better weather record. One must not leave this topic on such a pessimistic note. I have had three cloudless or well nigh cloudless days—one at Burrafirth, when we explored the caves, and searched vainly for the Sea Pea. The great fiord was a magnificent sight. The huge cliffs of Saxavord were alive with sea birds, thousands of quaint puffins so tame as to acutally allow one to touch them with a stick ere they whirred off into the bright air like a toy torpedo, myriads of guillemots, black cormorants, snowy kittiwakes, the graceful terns and skuas, those pirates of the sea. Again and again, when a tern had captured a fish, he was attacked in swift relentless curves of flight by a pair of Richardson Skuas until, with a protesting scream, the fish was dropped, to be captured ere it reached the water by the voracious free-booter. Often our boat was surrounded by seals that were frolicing about enjoying the vivid light and warmth, their heads rising above the surface like a retriever dog. The sea itself was of a glorious hue—the colour of the blue of a steel saw, and the white surge breaking on the black rocks was of crystalline purity. Then landward the yellow sands were glowing bright, here and there showing patches of *Vicia Cracca* of an indigo tint. Above them, on the dull green slopes, were thousands of kittiwakes, who take their bath in the fresh waters of the Loch of Cliff, and then dry themselves on the grassy slopes before going out again to sea. To the west rises the

hill of Hermaness, the sanctuary of the Great Skua, who much resented our visit to his domain, and here on the sea cliffs in a few places grow the Honeysuckle and rare Hawkweeds.

Our second brilliant day was in the south of the Mainland at Sumburgh Head, where to the west looms up the dark headland of Fitful Head, and close by is Jarl's House. All about in the sand dunes were the pale lilac stars of a Gentian, patches of the deep blue-flowered *Vicia Cracca* and large golden-flowered *Lotus corniculatus*, the local name of which is *Taegirs*. Few places more beautiful in these conditions exist than Loch Spiggie and the adjacent bay, since not only is there loveliness of coast outline and splendid cliffs, but the sea excelled even the famed Littoral in the purity of its azure, and here had none of the artificial surroundings to detract from its charm. A third wonderful day was a motor ride from Lerwick to Tingwall, Scalloway, Walls, and Sandsting towards the island of Papa Stour, when there was a continued succession of splendid sea views, fiord after fiord coming into sight, and the hill slopes showed such a multitude of Euphrasias in most magnificent colouring with *Gentiana campestris*, Marsh Orchids, and wonderful *Trifolium pratense* and *Lathyrus palustris* as one never expects to see again. Such days repay the visitor for many hours of monotonous dreariness, and they remain in one's memory while others are forgotten.

I must take this opportunity of thanking Mrs Saxby, the sister of Thomas Edmondston, for her kindness, and to recommend the little volume on the Shetland Flora which her son prepared, and which has an appreciation of Edmondston from her facile pen. To Dr Saxby, as well as to Mr John Campbell of Lerwick, Mr Henderson of Belmont, Sir W. Cheyne of Fetlar, and Mrs Saxby of Dunrossness I am indebted for kindness; and to my companions, the Rev. Prebendary Burdon, Mrs Wedgwood, and T. Churchill for ready help.

G. C. Druce.

INTRODUCTION.

Tate (*Journ. Bot.* 14, 1866) gives the flora as consisting of 364 indigenous species and 14 varieties.

Beeby, who made 340 gatherings (*Scot. Nat.* 25, 1891), gives the number of plants seen in his five years' investigations as 365, all of which are represented in his herbarium. He saw dried specimens of 15 other species, making in all 380. He says about 30 other species have been recorded but are doubtful. This would bring the number to 410. He thinks that further investigation may bring the total to 450 species. About 75 are also on record which are either casual or erroneous. In five or six subsequent visits between 1891 and 1907 Beeby added 38 species to the foregoing total of 380.

William West catalogued 221 species, 8 planted and 4 varieties. 167 were noticed for Unst and 173 for the Mainland. West added about 3 species to the flora. He also gives *Juncus glaucus* and *Lychnis alba*, which need confirmation.

Ostenfeld (Warming's *Flora of the Faroes* 108, 1908) contrasts the flora of the two groups of islands. He cites 375 species for the Zetlands, including those introduced by man, and 317 for the Faroes. 265 are common to both groups, 50 are peculiar to the Faroes, and 110 to Zetland. The Faroes have mountains of a much higher altitude than the Zetlands, hence the more distinctly alpine character of the flora. These alpines include:—*Ranunculus glacialis*, *Papaver radicatum*, possibly *Arabis alpina*, *Draba rupestris*, *Cerastium cerastoides*, *Sagina caespitosa* (*nivalis*), *Potentilla verna*, *Alchemilla faroensis*, *A. acutidens*, possibly *Dryas*, *Saxifraga decipiens*, *S. hypnoides*, *S. nivalis*, *S. rivularis*, *S. stellaris* (a curious absentee from Zetland), *Sedum villosum*, *Epilobium lactiflorum*, *E. alpinum*, *Gnaphalium supinum* (recorded from Ronas Voe but needs re-finding), twenty-one endemic Hieracia, several Taraxaca, *Veronica alpina*, *Bartsia alpina*, *Salix glauca*, *Juncus biglumis*, *Juncoides arcuatum*, *Carex atrata*, *C. Lyngbeyi*, *C. saxatilis*, *Poa glauca*, *P. alpina*, *Equisetum pratense*, *Polystichum Lonchitis*, and *Lycopodium annotinum*. The Faroes have, too, a small group of adventive species, mostly agrical, such as *Trifolium procumbens*, *Pisum sativum*, *Scabiosa arvensis*, *Apera Spica-venti*, *Briza media*,

and *Lolium multiflorum*, the latter cultivated. Two or three northern coastal or lowland plants are in the Faroes but have not yet been found in the Zetlands, *i.e.*, *Carex salina*, *Juncus balticus* and *Koenigia islandica*.

In 1920 and 1921, in company with Prebendary Burdon, Mrs Wedgwood, and T. Churchill, I visited Zetland and noted all the plants observed, and collected specimens of the greater number. Several critical species still require working out. I noted 428 species, including introductions, and about 200 varieties, forms and hybrids. I may say that the species now known to grow in the Zetlands amount to 446 native species and 59 adventive species—505. 70 others have been recorded but they are mostly errors of identification. Such are:—*Ranunculus reptans*, *Fumaria Vaillantii*, *F. parviflora*, *Raphanus maritimus*, *Viola lutea*, *Dianthus deltoides*, *Silene Cucubalus*, *Cerastium semidecandrum*, *Stellaria graminea*, *Arenaria sedoides*, *Hypericum perforatum*, *Trifolium medium*, *Potentilla procumbens*, *Rosa lutetiana*, *R. dumalis*, *Sedum anglicum*. *Myriophyllum spicatum*, *Callitriche verna*, *Conium*, *Anthriscus Scandix*, *Peucedanum sativum*, *Daucus Carota*, *Galium uliginosum*, *Gnaphalium sylvaticum*, *Anthemis Cotula*, *Artemisia Absinthium*, *Hieracium denticulatum*, *H. maculatum*, *H. flocculosum*, *H. lasiophyllum*, *H. truncatum*, *H. stictophyllum*, *Centaurium umbellatum*, *Myosotis collina*, *Veronica montana*, *Cuscuta epithymum*, *Nepeta Cataria*, *Plantago media*, *Polygonum Hydropiper*, *P. Raii*, *Populus nigra*, *Juncus inflexus*, *J. compressus*, *Sparganium ramosum*, *Potamogeton lanceolatus*, *P. lucens*, *P. vaginatus*, *P. crispus*, *Eleocharis acicularis*, *Eriophorum latifolium*, *Carex capillaris*, *C. caryophyllea*, *C. cespitosa*, *Calamagrostis epigeios*, *Avena fatua*, *Poa compressa*, *Bromus arvensis*, and *Dryopteris Thelypteris*. Among those which may be re-found are *Gnaphalium supinum*, *Taraxacum paludosum*, *Veronica Chamaedrys*, *Nepeta hederacea*, *Stachys sylvatica*, *Beta*, *Atriplex deltoidea*, *Polygonum Bistorta*, *Habenaria albida*, *Potamogeton gracilis*, *Rynchospora alba*, *Carex distans*, and *Juniperus communis*. Therefore, to the 506 species recorded we may safely add 4=510 species. In addition to these, further exploration may succeed in bringing up the number to 530.

Allusion has been made to the more alpine character of the Faroe flora. I was much surprised to find Zetland possessing so few

alpines. Its flora most closely approximates to the Faroe flora, the Icelandic being still more arctic. Compared with the mainland of Scotland, it will be observed how many species fail to cross the sea. Its flora is also distinctly poorer than that of the Orkney group.

Notwithstanding the prolonged period the sun is above the horizon in the summer months, it must be remembered that the climate during that period is frequently cloudy, windy or wet, or, as I found, all three combined. In 1921 we only had what could be called two sunny days in a month, and the temperature was very low. In 1920 it was much the same, and our frequent experience was that, after motoring twenty miles or so to a suitable locality, scuds of rain came on and spoilt the day. Ronas Hill thus twice was put out of bounds, for it was shrouded in heavy mist and rain. Rarely, if ever, did we return in dry clothes. The islands are the haunt of winds, and these exert a powerful influence on the vegetation. On the hill-slopes the plants are very small, *Linum catharticum*, *Plantago maritima* and *Rhinanthus Crista-galli* being almost flowerless. *Vaccinium Myrtillus* is reduced to an inch or so, and is rarely seen flowering; *Draba incana* is dwarfed to less than an inch; *Erica cinerea* and *Calluna* are small and poor, and the Carices are depauperate, and in 1921 were almost barren and worthless for critical examination. The solitary specimen of *Melampyrum pratense* found was less than two inches high and possessed two flowers. Yet on the other hand many plants, although smaller in stature than their English representatives, had magnificent flowers. Noticeable among these were *Matricaria inodora*, *Lathyrus pratensis*, *Trifolium pratense*, *T. repens*, *Lotus corniculatus*, *Senecio aquaticus*, *Jasione* and *Raphanus Raphanistrum*. The plants which were in special beauty and luxuriance were the Eyebrights. They were so common, so profuse in flowering, and so showy and varied in the lovely tints of colour that it was worth the journey to see them. On the one sunny day we had at Sumburgh it was also a great delight to see the whitish stars of a sub-species of *Gentiana Amarella* studding the sandy soil, and to see the dense masses of deep indigo made by *Vicia Cracca* on the yellow sands. Some of the rocky cliffs were gay with *Sedum roseum* and Sea Thrift, and a few places such as Cliva Hill, Eala Burn, or Loch of Cliff, were gay with Hawkweeds.

The force of the wind in a storm is prodigious, and the surf or

sea-spume is scattered for miles. It has been known to wash over the lighthouse near Hermaness, and evidence of it may be seen on the tops of the highest cliffs. It may be that some of the very local plants have been introduced in this way, for, as Warming says of the Faroes, the flora is a " young flora." It must be remembered that many of the plants are extremely local and exist only in small quantity. For instance, of *Hieracium breve*, perhaps only a score of specimens exist. West found only single specimens of *Juncus trifidus* and *Juncoides spicatum*. Less than a dozen specimens of *Arenaria rubella* have been noticed, and I found a solitary specimen which Lindman says is *Sagina saginoides*. This, too, is the case with water plants. Beeby found only a small quantity of floating *Elatine*. *Potamogeton suecicus* is extremely local in three lochs in which it grows, and I only saw *Tolypella nidifica* in a solitary loch in Dunrossness.

The absence of woods and hedges accounts in part for there being no sylvestral species, and the absence of wheat-culture limits the agrical introductions. There are no manufactories to bring in the accompanying aliens. There is, however, besides these causes some other influencing reason to account, for example, for the rarity of *Hypochoeris radicata* or the absence of so many species which might be expected to occur. This, as Warming says, may be due to juvenility, and contrasts strongly with such older floras as are possessed by the Azores, Canaries and Madeira, which are rich in endemic plants. To return for one moment to the extremely local character of a few species. Does not this support the theory of a somewhat recent introduction of species by natural means—wind, sea-currents, aquatic birds or man? I may instance the *Melampyrum* discovered by me this year, *Utricularia major* known only from one locality in Unst, *Bartsia verna* from one locality on the Mainland, *Aira caryophyllea*, *Senecio Jacobaea*, *Sium erectum* and *Radicula Nasturtium*, each extremely local. It must be remembered that the islands have been under sheep and pony-grazing from remote times, and that doubtless in more recent days the small bushes and trees, which we have good evidence to prove once grew on the islands, have been exterminated, so that except on some holm on a lonely loch, or some deep ravine on a wind-swept hill, there is but little chance for plants to thrive.

I may add that with the exception of the var. *alpinum* of *Polygonum viviparum* and the Lumbister supposed *Potamogeton gracilis* all Mr Beeby's critical plants have been regathered by me in my recent visits.

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(F.).—Signifies the plant grows in the Faroes.

!—Signifies that the writer has seen the plant in the locality.

*—New record for the Islands.

†—Adventive or introduced species.

× —Hybrid.

FLORA ZETLANDICA.

7. THALICTRUM ALPINUM L. (F.). Common, *E. L.* Dry pastures and stony places, especially on serpentine or limestone, descending even to sea-level. Tresta, Fetlar, *E. Fl.* Ronas Hill, 1460 ft.!; Muckle Heog!, *Tate.* Balta Sound!, *C. C.* Local on schistose rocks at Ollaberry at less than 100 ft., *West.* Hill above Asta Loch!; Clousta Voe; Lumbister, Yell; Estwick Burn; Bustwich, *Beeby.* Hoo Hill. Saxavord. Clibberswick. Watlee. Skaa. Cliva Hill. In loose stones on the border of Burga Water, a large-leafed form.

19. RANUNCULUS REPENS L. (F.). Frequent, *E. L. & Fl.* One of Tate's specimens from Bressay, teste H. C. Watson, is *R. acris.* Out Skerries, 1866, *Peach.* Not common, *West.* Collafirth; Scalloway!, *Beeby Hb.* Bressay. Mousa. Not rare. Usually as a small form with more divided leaves. It is chiefly in soil disturbed by man.

20. R. ACRIS L. (F.). Everywhere, *E. L. & Fl.* Burrafirth, etc., *C. C.* Bressay, *Tate.* The type extends from north to south on sand tracts and to dry grassy hill-sides near the sea, *Beeby*, 1891. Bressay. Mousa.

Var. STEVENI (Andrz.). This is the var. *pumilus* of Ronas Voe, 1886. Common, Ollaberry; Skelberry; Bressay; pastures by Asta and Tingwall lochs, 1907, *Beeby.*

Var. BORAEANUS R. & F., f. RECTUS (Bor.). Quendal Sands; Scalloway; Hillswick; Ollaberry; Balta Sound; Ronas Voe; Hamna Voe, local, *Beeby.* Beeby, in 1907, doubts if type *Boraeanus* occurs.

Sub-var. PUMILUS R. & F. Loch of Lumbister, Yell, teste Rouy, *Beeby.*

Var. FRIESIANUS R. & F., forma VULGATUS (Jord.). Near Spiggie!; between Lerwick and Grimista; Estwick Burn; Ollaberry; Gluss Burn, teste Rouy, *Beeby*, 1907. Ronas Hill; Unst, *C. C.*

Var. TOMOPHYLLUS (Jord.). Balta Isle, *W. R. Linton.*

The specimens I saw at Balta Sound in 1920 I should refer to var. RECTUS Bor. They were in magnificent flower in 1921.

24. R. FLAMMULA L. (F.). Common, *E. L. & Fl.* Lerwick; Ronas Hill; Unst, *C. C.* Bressay. Mousa. Balta Isle.

Var. TENUIFOLIUS Wallr. Edmondston's *reptans* and *radicans* (Nolte). Little Setter Loch, Yell, *Beeby* in *Scot. Nat.* 21, 1887. In cultivation this at once reverted to type. See *l.c.*, 210, 1888. Scalloway; Punds Loch; Eala Water!; Burga Water!; Roer Water; Twart Burn, *Beeby*. Bardister. Burrafirth. None of the specimens seen in 1920 and 1921 could be referred to *R. scoticus* Marshall, itself only a variety of *Flammula*.

[25. *R. reptans* L. Stony margins of sub-alpine lakes, *E. Fl.* This is an error for the creeping state of *R. Flammula*. The true *reptans* is recorded for the Faroes.]

*38. R. TRICHOPHYLLUS Chaix. [Kirkiegarth Loch, *Beeby*, 1891. He transferred it to *R. Drouetii* F. Schultz in *Ann. Scot. Nat. Hist.* 166, 1907.] Ditch near Loch Spiggie, 1921.

39. R. DROUETII F. Schultz. Kirkiegarth Loch, *Beeby*, 1891. See above. The specimen is in poor condition and is not characteristic.

42. R. BAUDOTII Godr. Abundant at the north end of Spiggie Loch! and in Brue and Hillwell Lochs, *Beeby*, *l.c.*, 27, 1891.

46. R. HEDERACEUS L. Skelberry, etc., not seen north of Levenwick, *Beeby*, *l.c.*, 27, 1891. Fair Isle, *Beeby Hb.* Spiggie, 1921, beautiful and characteristic.

47. R. FICARIA L. (F.). Abundant, *E. L. & Fl.* Ollaberry; Sundabanks, *Beeby Hb.* Dunrossness, *Mrs Saxby*, *Jun.* Garden weed at Balta, *Mrs Saxby*.

[*R. glacialis* L. and *R. auricomus* L. (F.).]

48. CALTHA PALUSTRIS L. (F.). Common, *E. L. & Fl.* Unst; Yell, *C. C.* Baliasta, Unst; Little Setter, Yell; Ollaberry; Scarff Burn; Hamna Voe, *Beeby*. Bressay. Mousa. Lund, etc.

"By the Loch of Cliff the large erect *C. palustris* which did not root at the nodes had leaves exactly like those of *C. radicans*," *Beeby* in *Scot. Nat.* 210, 1887.

49. C. RADICANS Forst. Near the Loch of Spiggie, 1921.

Var. ZETLANDICA (Beeby in Scot. Nat. 21, 1887, under *palustris*) Druce. South end of Loch of Cliff!; Arisdale Burn; Hamna Voe; Little Setter Loch, Yell; Clickhimmin Loch!, *Beeby*. Haroldswick. Uyea, etc.

Mr Beeby thought it was nearer to *palustris*, of which it has the leaf-shape although a smaller plant. But the chief character is the rooting node which is maintained in cultivation. I therefore put it under *radicans* in my *List*.

50. TROLLIUS EUROPAEUS L. Near Quendal, *E. Fl.* Loch End, *Beeby*, 1889.

77. CASTALIA ALBA Woods. In a little loch N.-W. of Ronas Hill, *E. Fl.* Lunga Water; Bunya Water; Loch at Brunatwatt, 1891; tarn by Lunga Water, *Beeby*.

Var. *OCCIDENTALIS (Ostenf.). Near Lunga Water, 1920. Probably the Shetland lilies belong to the variety, which may be the var. *minor* (DC.).

†80. PAPAVER RHOEAS L. Alien. Skaa, Unst; North Maven, *E. Fl.*

†81. P. DUBIUM L. Abundant, *E. L. & Fl.* Unst, *C. C.* Norwick!, *Tate*, 1865. Exnaboe, 1891, as *Lamottei*; Balta, *Beeby*.

Some of the Norwick plants are extremely small. Doubtless at one time English oats or corn were sown here as evidenced by the occurrence of the Poppy, *Valerianella olitoria*, *Geranium molle*, *Gnaphalium uliginosum*, etc.

[*P. radicatum* Rottb. (F.).]

'89. GLAUCIUM FLAVUM Cr. Salam [Sullum] Voe; North Maven, *E. Fl.*

†111. FUMARIA OFFICINALIS L. Frequent, *E. Fl.* Quendal Bay; Sconsburgh; Scalloway!; Fetlar, *Hb. Beeby*. Setter. Conningsburgh.

[113. *F. Vaillantii* Lois. Balta Sound, 1839, *E. Fl.* In

Edmondston's *List F. parviflora* is given as abundant in sandy fields. Both are doubtless errors.]

122. RADICULA NASTURTIUM Druce. Sand Lodge, Mr Bruce's, *C. C.*, 1868. It still grows plentifully in a ditch to the north of the house, to which it may have been originally introduced.

140. ARABIS PETRAEA Lam. (F.). Rare, *E. L.* Frequent on exposed serpentine, *West.* Springfield!, *Beeby.*

Var. GLABRA Edmondst. On loose serpentine gravel, Balta Sound, *E. Fl.* All the Unst plants are glabrous. It descends on the serpentine to 50 feet and varies from white to lilac-flowered. At Clibberswick it grew on sea cliffs as well as on the hill. The older trivial is var. *faroensis* (Horn.) = *Cardamine faroensis* Horn.

[*A. alpina* L. Recorded by Trevelyan from the Faroes, but needs confirmation.]

142. CARDAMINE PRATENSIS L. (F.). Common, *E. L. & Fl.* Unst; Yell, etc., *C. C.* Tangwick!; North Maven!; Sundabanks!; west of Hagdale!, *Beeby.* Uyea. Brecken, Unst. Swinister, North Maven. Mousa. Bressay. Spiggie, etc.

Var. DENTATA (Schultes). Balta Sound; Haroldswick; Ronas Voe, *Beeby.*

I should not refer any Shetland plant seen by me to Schultes' *dentata.*

146. C. HIRSUTA L. (F.). Belmont, Unst, *E. Fl.* Rocks by the Vaara Burn; by Burga Water!; above Hamari Water, *Beeby*, 1908.

[*C. sylvatica* Link. (F.).]

161. DRABA INCANA L. (F.). On serpentine, Unst! and Fetlar; on limestone near Tingwall!; on granite near North Roe, *E. Fl.* Balta Sound!, *C. C.* Hoo Field!, *Beeby.* Muckle Heog!, Unst, 400-500 ft., *Tate* (var. *confusa* = the type).

Var. CONTORTA (Ehrh.). Springfield and Muckle Heog, 50-450 ft., *Tate.* Loch of Cliff; Tingwall, *Beeby.* A plant from Wick of Hagdale Beeby thought came under var. *flexuosa* Lange, but was too immature to be decisive. I have only seen the type with glabrous

pods in Shetland as at Tingwall. It is plentiful on Clibberswick nearly to sea level, above Watlee Loch, on Colvadale Hill, etc. It is sometimes dwarfed to 1½ inches, and occasionally it is a tufted plant.

[*D. hirta* L., var. *rupestris*. (F.).]

167. COCHLEARIA OFFICINALIS L. (F.). Frequent, *E. L. & Fl.* Ulsta, the most northerly British land, *E. Fl.* Mousa; Lerwick; Unst, *C. C.* Spiggie only, *Beeby*, 1891. Fair Isle, *Straker*. Holm; Scalloway, *Beeby*. Westing. Balta Isle. Hermaness.

168. C. ALPINA Sweet. Very dwarfed plants, Balta, *West.* [These are probably *micacea.*]. Frequent (*sic*), *Saxby Fl.* Sandwick; Hillswick, true in cultivation, *Beeby*, 1897. Tate thought this was the *C. groenlandica* of the *Flora.*

169. C. MICACEA Marshall. This is probably the plant recorded by Beeby in 1886 as *groenlandica* from Balta serpentine hills (!) and hills near Ollaberry. Balta Sound, *W. A. Shoolbred*, 1892 (*Journ. Bot.* 152, 1895). Hill of Hamar, *Beeby.* Greenfield. Watlee. Clibberswick.

170. C. GROENLANDICA L. (not of *Fl. Shetl.*). Ollaberry, *Beeby* in *Scot. Nat.* 22, 1887, teste Lange. This proved constant in cultivation. See *Ann. Scot. Nat. Hist.* 33, 1889. Also from the Heogs, Unst, *Hanbury*; Fair Isle, *Straker*; Laxfirth Voe, Lerwick; Sandvoe, *Beeby.* Ordale, Unst.

172. C. DANICA L. Muddy sea shores, Dales Voe; Balta Sound, *E. Fl.* Large plants at the Knabb, Lerwick; Bressay, *Beeby.*

[" All the many different forms of *Cochlearia* found in the Faroes pass so imperceptibly into one another that it seems most natural to name them collectively under one name. *C. danica* does not occur."—Warming.]

*†176. HESPERIS MATRONALIS L. Alien. On the foreshore, Balta Sound, Unst, 1921.

†177. WILCKIA MARITIMA Scop. Alien. Knabb, Lerwick, *Beeby*, 1892. It is commonly cultivated there and is a mere garden stray.

204. SUBULARIA AQUATICA L. (F.). Bardister Loch, *Beeby*, 1891. Proves to be common in the lochs, *Beeby*, *l.c.*, 1907. Tarn on Gibbies Law Burn, *Beeby Hb.* Still at Bardister Loch, 1920.

*†205. BRASSICA OLERACEA L. Alien. Merely an escape from cultivation. In Shetland cabbage seed is sown in small plots surrounded by a high wall of rough stones in order to give shelter to the seedlings, which are grown very closely packed. They are then transplanted. Some of these seedlings had been washed down by a brook near Hoo Field in 1921, but it is scarcely probable that they will establish themselves.

†216. B. ARVENSIS Scheele. (F.). Far too common, *E. L. & Fl.* Unst, *C. C.* Balta, *Beeby*. Scalloway. Lerwick. Norwick, etc.

[*B. campestris*, *B. Napus*, and *B. nigra* are recorded from the Faroes.]

†217. B. ALBA Boiss. (F.). Alien. A garden weed. Walls, and in cultivated fields, 1891, *Beeby*.

232. BURSA PASTORIS Weber. (F.). Very common, *E. L. & Fl.* Lerwick; Unst, *C. C.* Scalloway, *Beeby Hb.* Haroldswick, 1865, *Tate*.

*B. BRITTONII (Almq.). Balta. Haroldswick.

†241. LEPIDIUM SATIVUM L. Alien. Knabb, Lerwick!, *Beeby*, 1892. Also seen there in 1920.

†249. THALSPI ARVENSE L. Alien. Sinclair's garden, Ollaberry, *Beeby*, 1896.

271. CAKILE MARITIMA Scop. (F.). Abundant, *E. L. & Fl.* Exceedingly large, Burrafirth!, *C. C.* Breiwick, North Maven, *Beeby*. Norwick. Haroldswick, luxuriant and very fragrant, slightly suggesting vanilla. Uyea. Spiggie. Lerwick. Quarff, etc.

Var. INTEGRIFOLIA Hornem. Mid Yell Voe, 1887; Knabb, Lerwick, 1888; Sandwick, *Beeby Hb.*, but the leaves are lobed. I could see no entire leaved plants in the Shetlands. In the Quarff plant

they were the least cut. Probably the Haroldswick plant may be the var. *latifolia* (Poir.) which is recorded from the Faroes.

274. RAPHANUS RAPHANISTRUM L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Lerwick, as *Sinapis arvensis*, *Tate*. Fair Isle, *Skene*. Balta; Sand Voe; Sullum Voe, *Beeby Hb*.

Var. *FLAVUM (Gray) Druce. Bressay, Dunrossness. It is the prevailing form. The petals are much larger than those of the English plant.

[275. *R. maritimus* Sm. East shores of Bressay, *E. Fl.* Doubtless an error.].

293. VIOLA SYLVESTRIS Kit. (F.). Ollaberry; rocks above Eala Water, *Beeby*, 1887; Lerwick, etc., 1889; Laxfirth Voe, *Beeby Hb*. Mavisgrind.

294. V. RIVINIANA Reichb., as *V. canina*. (F.). Common, *E. L. & Fl.* Buness, *Tate*. Shetland, *Middleton* in *Scot. Nat.* 319, 1886. Balta Sound, 1888; Ollaberry; Melby; Sandness; Eala Water; Burn of Skaa!, *Beeby Hb*. Den of Sundabanks. Scalloway. Bressay. Mousa. Loch of Fleet. Watlee. Norwick, etc.

Var. *DIVERSA Greg., forma PSEUDOMIRABILIS Greg. Loch of Cliff.

*295. V. RUPESTRIS Schmidt, var. GLABRESCENS Neum. Balta Sound, 1920; Dunrossness, teste Gregory.

296. V. CANINA L. (F.). Buness, Unst!, *Tate*, 1866, as *Riviniana*. Shetland, *Middleton* in *Scot. Nat.* 319, 1886. Here and there, *Beeby*, 1887. Unst and Ollaberry, *West*. Top of Ronas Hill; Ollaberry; Saxavord!, *Beeby Hb*. Tingwall. Cruciefield. Voesgarth. Unst. Scalloway.

Var. ERICETORUM (Schrad.). Burrafirth. Bressay.

Var. *LANCEOLATA M.-Don. Skaa. This, Mrs Gregory thought, might be *canina* × *lactea*, but the latter species is not known north of Yorkshire.

Var. *CALCAREA Reichb. Balta, serpentine.

301. V. PALUSTRIS L. (F.). Bressay!; Unst; Yell, *Tate*, 1866.

Ronas Hill, *C. C.* The Shetland plant is remarkable for its often apiculate not very broad leaves, teste Murbeck. Hillswick; Collafirth; Valla Dale; Yell, *Beeby Hb.* Watlee. Hoo Hill.

[303. V. TRICOLOR L. (F.). Very common, *E. L. & Fl.* Balta Sound; Saxavord, *C. C.* Edmondston realised that *V. arvensis*, "frequent in cornfields, was among the most distinct of our British Violets." See below.].

*V. LLOYDII Jord. Tingwall. Laxfirth. Whiteness. Bressay. Norwick. Balta. Burrafirth, etc. Doubtless the *tricolor* of previous writers.

*V. SEGETALIS Jord. Balta. Norwick. Lerwick. This is doubtless Edmondston's *arvensis*.

[307. *V. lutea* Huds. ERROR. Shetland, Beeby sp., Bennett in *Scot. Nat.* 58, 1886. It is omitted by Trail. It is an error of identification. The plant belongs to the tricolor section. See *Ann. Scot. Nat. Hist.* 165, 1907. Not common (*sic*), *Saxby Fl.*].

308. POLYGALA SERPYLLACEA Weihe. (F.). The more common form, *Tate*, 1865, in *Hb. Druce*, as *depressa*. The only form seen, *Beeby*, 1886. Not frequent, *West*. Otterswick, Yell; Tingwall!, *Beeby Hb.* Sundabanks. Hoo Field. Bressay. Mousa. Saxavord. Hermaness. Vallafield.

309. P. VULGARIS L., aggregate. Common, *E. L. & Fl.* As the segregate, Balta; Ronas Hill, *C. C.* Fine and typical, Gluss Burn, Ollaberry, *Beeby*, 1892. Near Spiggie. Brousta. Scalloway. Eala Water. Mousa. Burrafirth. Haroldswick. Clibberswick. Whiteness. North Roe. Mavisgrind. Some of these had narrow sepals.

Var. *BALLII Ostenf. (F.). Mousa Isle. Brousta.

[318. *Dianthus deltoides* L. Isle of Vaila, *Dr Neill*. See *E. Fl.*, xiii. Doubtful, *Beeby*. Probably the Sea Pink, a local name for *Statice*, was meant.].

334. SILENE MARITIMA Sm. Common, *E. L. & Fl.* Mousa!; Unst; Yell, *C. C.* Balta!; Hamar; Burrafirth!; Unst; Hamna Voe,

Beeby. Fair Isle, *Skene*. Lerwick!, *Tate*. Sumburgh. Westing. Watlee. Hermaness.

[336. *S. Cucubalus* Wib. Saxby in the *Flora* says that this occurs on the grassy cliffs on the northern side of Hermaness, but doubtless he mistook the large form of *maritima* which alone grows there.].

346. S. ACAULIS L. (F.). Very plentiful on the euphotide and serpentine, *E. L. & Fl.* Muckle Heog, *Tate*. Hunie!; Unst, *C. C.* Common at not more than 100 feet, *West*. Whiteness Voe; Springfield; Wester Wick; Muckle Heog!; Unst, *Beeby Hb*. Abundant on the Lee of Setter and on Hoo Field to 100 feet. Balta Isle. Hermaness. Saxavord. Clibberswick, etc. Descends to the coast level near Haroldswick and is common on the road-side (50-80 ft), Balta, seeding freely. Ascends to 850 ft.

358. LYCHNIS FLOS-CUCULI L. (F.). Very common, *E. L. & Fl.* Unst, *C. C.* Ollaberry, *West*. Tingwall!; Hamar Voe; Clousta Voe; Mailand Burn!, *Beeby Hb*.

Var. *CONGESTA Lec. & Lam. Lund. Balta.

Sub-var. *RUBESCENS Druce, with the calyx ribs reddish. Ronas Voe. Bressay. Mousa. Dunrossness.

Forma *ALBIFLORA (Peterm.). Coults Mill, Uyea. Haroldswick.

?†359. L. ALBA Mill. Rare, *E. L.* Very little either at Ollaberry or Unst, *West*. Not seen by Beeby. Garden at Balta Sound, *Saxby Fl.* I saw white-flowered *dioica* there. Alien or error.

360. L. DIOICA L. (F.). Common, *E. L. & Fl.* Haligarth, *C. C.* Burrafirth; Loch End; Burravoe; Scousburgh; Mid Yell Voe, *Beeby Hb*. Bressay.

Var. ZETLANDICA (Compt.). Burrafirth, *Tate*, 1865 (not as given in *Camb. Fl.*, Binnafirth). Mid Yell Voe, *Beeby*. Scalloway, *Straker*. Noup of Noss, *Smith*. Tetlar (*sic*), *Compt*. (? Fetlar). Hagdale, 1920. Setter. Fedaland. Dunrossness. Spiggie. Whiteness. Varying from light pink [forma *expallens* (Lange)] to dark crimson. Often grown in gardens. It is quite a beautiful plant. Also in Hoy, Orkney.

†363. L. GITHAGO Scop. (F.). Casual. An import with rye or wheat seed, *Saxby Fl.*

369. CERASTIUM NIGRESCENS Edmondston Fl. xv., 1845, et ex Watson Cyb. Brit. i., 233, 1847. See also *Scot. Nat.* 24, 1887. (F.). Briefly the history of this interesting species is as follows:— Edmondston, then a youth, first discovered it on the serpentine of Balta Sound and described it in the *Phytologist* ii., 95, 1845, as *C. latifolium.* Subsequently he saw it differed from the continental plant, and in the preface to the *Flora of Shetland* called it *C. nigrescens* (the preface was evidently written later than the text, as it gives certain additions). He distributed specimens to the Botanical Society of London as *C. nigrescens* Edm. MS., and these are commented on in the *Proceedings* of February 7, 1845, which are printed in the *Phytologist* 96, 1845, making it a valid publication. These are the proofs of its publication on or before 1845, and his name has precedence over *C. arcticum* Lange (itself a compound species) or *C. Edmondstonii.* The plant is frequent over the serpentine of the hills to the north of Balta Sound, making a conspicuous feature of the vegetation, and it was found also on broken limestone above Loch Watlee by F. J. Hanbury in 1894. I was unable to find it on Clibberswick or Colvadale. The nigrescent character of the leaves seems to be due to the presence of chromate of iron in the soil. In ordinary soil the leaves lose the purple coloration although the seed and other characters remain constant. It is unknown elsewhere, but the wholly green plant, forma (or var.) *Smithianum* nov. comb. (*C. latifolium* Sm., non L.), extends as far south as Snowdon, but always as an alpine species not descending below 2000 feet.

Var. ACUTIFOLIUM (Edmondston) under *latifolium.* This is a slight variation and, as Beeby says, grows rather more inland. I was unable to notice any hybrid although the Snowdon plant hybridises with *vulgatum.*

370. C. VULGATUM L. (F.). Very common, *E. L. & Fl.* Lerwick; Unst, *C. C.* Skaa, Unst, *Tate.* Balta Sound; Asta Voe; Ollaberry; Lerwick; Hildasay, *Beeby Hb.*

Var. MACROCARPUM (Schur) Druce=var. LONGIROSTRE (Wich.).

Grassy places among rocks at Ollaberry, with leaves 1½ in. long and capsule ¾ in. long, *Beeby* in *Scot. Nat.* 23, 1887.

Var. ALPINUM Gren. (F.). Tingwall. Asta. Scalloway. Hoo Field. Mousa. Clibberswick. A handsome plant. Under this as forma SERPENTINI (Syme) Druce. Burrafirth; Ollaberry (*Scot. Nat.* 34, 1889), *Beeby*. Balta, on the serpentine. Watlee.

Var. HOLOSTEOIDES (Fr.). Hill of Hamar, Unst, and Fair Isle, *Beeby*. They lack the characters of the tidal plant, and come under var. LUCENS Druce, which is not unfrequent on the serpentine at Balta, Clibberswick, Watlee, Colvadale, and Scalloway. The same form occurs on the serpentine at Cabrach, but it may be only a soil variant. To this cause I should also ascribe forma *nigrescens* mihi, alluded to by West as a rigid and nigrescent form, from the serpentine, where it is common, but I have also seen it in sterile fields in the Midlands and on dry banks by the coast in Britain.

371. C. VISCOSUM L. (F.). Common, *E. L. & Fl.* Unst; Scalloway, *C. C.* Ollaberry, *Beeby Hb.* Tingwall. Bressay. Mousa. Haroldswick. Muness, etc. Much less common and at lower levels than *vulgatum*. Often as a neat, erect plant; and usually in disturbed ground.

[373. *C. semidecandrum* L. Error. "Common, but hardly distinct from *triviale* (*sic*)," *E. Fl.* Unst, *C. C.* Doubtless a form of *C. vulgatum* or *tetrandrum* was mistaken for it. The small form, *congestum*, of the latter species has a superficial resemblance. Beeby and myself searched for it in vain. Needs confirmation. Not in the Faroes.]

374. C. TETRANDRUM Curt. (F.). Sandy ground, particularly frequent in the Island of Balta!, *E. L. & Fl.* Gluss Voe, 1865, *Tate*. *C. atrovirens* Bab. is said also to be common. It is wrongly stated to be a variety of *triviale*. Hunie, Unst, *C. C.* Common about the coast, *Beeby*. Very dwarfed on the serpentine, *West*. Ollaberry!; Burrafirth!; Hildasay; Mid Yell Voe; Brough of Culswick, Walls, *Beeby*. Very variable. Balta. Lund. Scalloway. Burrafirth. Hermaness. Saxavord. Skaa. Clibberswick. Lerwick. Bressay. Cunningsburgh. Sumburgh. Spiggie, etc.

Var. ZETLANDICUM Murbeck. (F.). Ness, N. Yell! (*Tate* as

pumilum). Balta Isle. Skaa Cliffs. Saxavord. Clibberswick. Hill of Hamar.

Forma CONGESTUM Druce. Scalloway. Balta.

Forma LUXURIANS Druce. Spiggie. Lund.

*374 (2). C. SUBTETRANDRUM Murb. Lund, Unst, 1921. This is somewhat doubtful.

[*C. cerastoides* Vill. (F.).]

379. STELLARIA MEDIA Vill. (F.). Everywhere common, *E. L. & Fl.* Lerwick; Yell; Unst, *C. C.* Clousta; North Roe; Balta, *Beeby Hb.* Bressay. Mousa, etc., frequent.

Var. MAJOR Koch. A fleshy maritime form on the shingly beech, Gutcher, Yell, *Beeby* in *Scot. Nat.* 211, 1887. Beeby also has a var. *neglecta* from the same place. This may refer to the same plant. Neither are the *S. umbrosa* Opiz. The plant is very variable in size, but it is extremely responsive to soil conditions. An extreme form is the f. *nana* Lange. Cruciefield Hill, Unst, *Beeby*, 1886. It also occurs on Clibberswick, etc.

[383. *S. graminea* L. Abundant, *E. Fl.* Error. Sought in vain, *Beeby.*]

384. S. ULIGINOSA Murr. (F.). Common, *E. Fl.* Burrafirth, *C. C.* Bressay, *Tate.* Everywhere in wet places, *Beeby.* Sand Voe; North Maven; Tingwall!; Collafirth, *Beeby Hb.* Bressay. Haroldswick, etc.

389. ARENARIA NORVEGICA Gunn. Found by Edmondston in May 1837. See *List.* On serpentine gravel to the north and north-east of Balta Sound, *E. Fl.* A single plant on Muckle Heog, 430 ft.; Balta, 50-80 ft., *Tate.* About Loch Watlee!, *Beeby & Hanbury.* West of Cruciefield!, *Beeby.* Clibberswick, in some plenty, *Burdon & Druce.*

391. A. SERPYLLIFOLIA L. Quendal House; Exnaboe; Dunrossness, *Beeby.* Sumburgh, on the sand dunes, looking native.

393. A. PEPLOIDES L. (F.). Common, *E. L. & Fl.* Burra-

firth, *Tate*, 1865. Loch End, *C. C.* Quarff. Sumburgh. Fedaland. Lerwick, etc. Lund. Haroldswick. Balta. Bressay. Mousa.

Var. DIFFUSA Hornem. Mid Yell Voe, but "leaves shorter and broader than in the Greenland plant," Lange, *Beeby*, *l.c.*, 24, 1887. Spiggie, etc. This is possibly the var. *major* Rostr. of the Faroes. Omitted in the *Camb. Fl.*

396. A. VERNA L. Gravelly ground, Ronas Hill, *Tate*. Whiteness Voe, *Beeby*.

397. A. RUBELLA Smith. Stony places on serpentine, Wick of Hagdale, very sparingly, *Beeby*. Lange thought it to be *A. hirta*, f. *condensata*. (See *Scot. Nat.* 24, 1887.). A few specimens on the serpentine slope immediately north of Balta Sound, and also near the Loch of Watlee, *Saxby Fl.* Sought in vain, 1920-21. *A. verna*, var. *hirta*, is reported from the Faroes. The Zetland plant is very near to the Breadalbane plant. The altitude in Zetland is under 400 feet, not 880 metres, the lowest elevation cited in the *Camb. Fl.* for the species.

[398. *A. sedoides* Kittel. Error? Hill of Clibberswick, *E. L.* Hill of Haroldswick, Unst; Ronas Hill, *E. Fl.* Colvadale, *Saxby Fl.* Never confirmed. Probably barren *Silene acaulis* was mistaken for it.]

399. SAGINA NODOSA Fenzl. Tingwall!, *Tate*, 1865, in *Hb. Druce*. Balta, *C. C.* Sparingly there on the hills, *Beeby*. Rare, Ollaberry, *West*. Watlee. Colvadale. Clibberswick.

Var. *MONILIFERA Lange. Tingwall. Balta. Clibberswick. Colvadale.

401. S. SUBULATA Presl. (F.). Unst; Fetlar; Bressay, *E. Fl.* Frequent, Galta Water; Houllma Water!; Culswick; Eala Water!; Ronas Hill, 1000 ft., *Beeby*. Balta Sound. Colvadale. Clibberswick.

Var. GLABRATA Lange. Ollaberry, *Beeby* in *Scot. Nat.* 25, 1887. Ronas. Saxavord. Burga Water, as a lax plant. Lea of Setter. Colvadale. Watlee.

403. S. SAGINOIDES Dalla Torre. [Frequent, *E. Fl.* Error. Occasionally on the serpentine at Balta Sound; stony places near Eala Water, *Beeby*, but subsequently found to be only forms of *subulata*. See *Ann. Scot. Nat. Hist.* 104, 1909.]. A solitary specimen, gathered by me in 1920 on Muckle Heog, Unst, is passed as this by Prof. Lindman. I could not see it in 1921.

[*S. nivalis* Fr. = *S. caespitosa* Lange. (F.).]

407. S. MARITIMA Don. Isle of Balta!; Sullum Voe; Brae, near Delting, *E. Fl.* Cliffs about Springfield, Unst!; Scalloway!, *Beeby*, 1888. East side of Unst, *C. C.* Surima Ness; Asta Voe!; Hildasay, *Beeby Hb.* Knabb, Lerwick. Balta. Hagdale. Uyea Sound. Bressay. Sumburgh. At 300 feet on the Hill of Hamar, Unst. Both prostrate and erect plants.

*Var. DEBILIS Jord. Lerwick. Balta Isle.

Var. PROSTRATA Towns. Mousa. Bressay.

408. S. PROCUMBENS L. (F.). Very common, *E. L. & Fl.* Unst; Yell, *C. C.* Lerwick, *Tate.* Ollaberry, *West.* Fair Isle, *Straker.* Sandwick; Loch of Uyea; Asta Voe; Sundabanks; Swinna Voe, Ainst, *Beeby Hb.* Bressay. Mousa. Balta Isle.

Var. PENTAMERA Druce. (F.). This is doubtless the *S. saginoides* of Edmondston, which, as Beeby says, is almost as common as the type, as at Scalloway, Lerwick, etc.

× SUBULATA Presl = × S. MICRANTHA Boreau. Stony places about Eala Water. Beeby at first thought it was *saxatilis*, and afterwards this hybrid. I should not separate it from *procumbens*, but I have the true hybrid* from near Lunga Water.

410. SPERGULA SATIVA Boenn. (as *arvensis*). (F.). Too common, *E. L. & Fl.* Lerwick, 1865, *Tate.* Unst, *C. C.* The only form seen. Top of Sneug, Foula; Clousta; Burrafirth, *Beeby.* Haroldswick. Norwick. Bressay.

412. SPERGULARIA MEDIA Presl (as *S. marginata*). (F.). Balta Voe, north side, *Beeby* in *Scot. Nat.* 211, 1888, as a robust plant, seeds nearly apterous. Laxfirth Voe; Clousta; Queyfirth, *Beeby Hb.*

Var. *ROBUSTA Druce. Balta Sound, near Ordale, 1920.

413. S. SALINA Presl (as *S. marina*), *E. L. & Fl.*, described as not unfrequent. Scalloway!; Uyea!; Asta Voe!, *Beeby*. Bressay.

421. MONTIA FONTANA L. (F.). The var. *rivularis*, Tate (1885) says, is common throughout the islands. The Shetland plant is *M. lamprosperma* Cham., which is the Linnean *M. fontana*. Ronas Voe; Mill Loch of Uyea, North Maven; Fair Isle, *Beeby*. Bressay. Mousa. Watlee. Saxavord. Lund, etc.

Var. *BOREO-RIVULARIS Druce. Haroldswick. Saxavord. Loch of Cliff. Sundabanks. Bressay. Fedaland. Eala Water.

424. ELATINE HEXANDRA DC. Floating specimens in Kirkiegarth Loch, *Beeby* in *Ann. Scot. Nat. Hist.* 167, 1907. In 1920 I failed to find it in either Bardister or Kirkiegarth Lochs.

432. HYPERICUM PULCHRUM L. Common, *E. L. & Fl.* Ronas Hill!; Unst!, *C. C.* Clousta; Fetlar; Fair Isle; Burn of Sundabanks!; Dales Voe!, *Beeby Hb.* Cunningsburgh. Scalloway. Hoo Hill. Burrafirth.

Var. PROCUMBENS Rostr. (F.). Abundant on the serpentine hills of Balta!; south side of Ronas Voe!, *Beeby*, *l.c.*, 25, 1887. Burrafirth, *Tate*, 1865. Cunningsburgh. Colvadale. Gallow Hill. Hermaness. Lee of Setter. Clibberswick. This keeps constant in culture.

With cream-coloured flowers on the hills above Lochs of Hostigates, *Beeby*.

[*H. quadrangulum* L. (F.).]

[436. *H. perforatum* L. Error? Near Ollaberry and Moss Bank, *E. Fl.* Needs confirmation.]

437. H. HUMIFUSUM L. Unst, one locality, *West*.

466. RADIOLA LINOIDES Roth. Moor at Skelberry and Brue Loch, *Beeby*, 1891. Scalloway, one locality, *West*. S.-E. of Spiggie, *Beeby Hb.*

†469. LINUM USITATISSIMUM L. Alien. Rare, *E. Fl.* Balta foreshore.

470. L. CATHARTICUM L. (F.). Common, *E. L. & Fl.* Unst; Scalloway, *C. C.* Muckle Heog, 1865, *Tate.* Very dwarfed and sometimes one-flowered on the serpentine, *West.* Quendal Bay; Voesgarth Hill; Balta Sound; Scatt, *Beeby Hb.* Laxfirth. Whiteness. Setter. Bressay. Mousa. Muness.

Var. *DUNENSE Druce. The common plant on the serpentine. Spiggie. Hoo Field. Sumburgh, etc. Often infected with *Melampsora Lini.*

†478. GERANIUM PRATENSE L. Alien. Unst, *West.* Balta Sound, *E. Weeks.* Merely a garden escape, as at Haroldswick foreshore and near Walls.

[*G. sylvaticum* L. (F.).]

†479. G. PHAEUM L. Alien. Tresta, Fetlar, *E. L. & Fl.* 34.

*†483. G. DISSECTUM L. Casual. Garden weed at Balta, 1921.

484. G. MOLLE L. Common, *E. L. & Fl.* and *Saxby Fl.* Seen by *Tate.* Burrafirth; Scalloway!, *Beeby Hb.* Norwick, Unst!, *Mrs Saxby*, in small quantity. Alien, doubtless, as in the Faroes.

488. G. ROBERTIANUM L. On the shore at Boddam, Dunrossness, *Beeby*, 1891.

497. ERODIUM CICUTARIUM Ait. Sandwick Parish, Low's *Tour*, 1774. Sandy ground, Levenwick, *Beeby*, 1907.

504. OXALIS ACETOSELLA L. (F.). At 500 ft. on the Björgs of Skelberry, *Beeby*, 1907. Perhaps the same locality as Pettadale Water, with *Hymenophyllum*, *Beeby Hb.*

†524. ACER PSEUDO-PLATANUS L. Alien. Planted only.

†537. ULEX EUROPAEUS L. Alien. Hill of Wormiedale, *E. L.* Planted at Tingwall, *Tate*, and at Balta Sound and Dales Voe, *Beeby.*

†540. CYTISUS SCOPARIUS Link. Alien. Planted at Balta Sound, *Beeby*.

[598. *Trifolium medium* Huds. Error. Frequent, *E. L. & Fl.* and *Saxby Fl.* "Probably a narrow-leafed form of *T. pratense*," *Beeby*. Doubtless the luxuriant form of *pratense* was mistaken for it.]

599. T. PRATENSE L. (F.). Abundant, *E. L. & Fl.* Bressay, 1865, *Tate*. Pale-flowered form, Bardister; Hillswick, *Beeby*. Hoo Field.

Forma ALBA. Bressay.

*†627. T. HYBRIDUM L. (F.). Alien. Balta.

628. T. REPENS L. (F.). Everywhere, *E. L. & Fl.* Bressay, 1865, *Tate*. Unst, *C. C.* Burrafirth, and a dwarf, large-flowered form near the sea at Hillswick Voe, *Beeby*. Spiggie. Scalloway. Sumbrugh. The flowers are larger than those of the English plant.

[*T. procumbens* L. (F.).]

641. ANTHYLLIS VULNERARIA L. Abundant near the sea, *E. L. & Fl.* Unst, *C. C.* Springfield, *Beeby*. Spiggie. Scalloway. Brousta. Setter. Mousa. Skaa. Westing.

Var. MARITIMA Koch. Burrafirth Cliffs, a beautiful plant, *Beeby*, 1887. Altered in *Scot. Nat.* 212, 1888, to var. *ovata* Bab. *in litt.* Lange had meanwhile provisionally named it var. *macrophylla*. In cultivation, however, the large terminal leaflet became less pronounced, and the new name was dropped.

Var. BICOLOR R. & F., as *Dillenii*. Occasionally, *E. Fl.* 30. Wick of Hagdale, flowers cream coloured and crimson, *Beeby*, 1888.

A very pale-flowered plant occurred on the serpentine at Balta in 1920, with the hairs on the stem appressed.

647. LOTUS CORNICULATUS L. (F.). Common, *E. L.* and preface xxiv. Unst, *C. C.* Burrafirth and Asta Voe, *Beeby*. Setter. Bressay. Mousa.

Forma GRANDIFLORA. Among rocks south of Sand Voe, *Beeby*, 1890. Altered to var. *crassifolia* in *Beeby Hb.* This is probably the

forma *carnosa* (Pers.) of the Faroe Flora. Spiggie. Setter, beautiful plants, with large, deep yellow flowers, quite different from the southern *crassifolia*. I suggest the name *grandiflora* should be retained. Clibberswick.

679. VICIA CRACCA L. (F.). Common, *E. L. & Fl.* Burrafirth, *Tate*, 1865. Unst; Sandwick; Yell, *C. C.* Berwick; Sumburgh, *Beeby Hb.* Scalloway. Tingwall. Hoo Field. Bressay. Sumburgh. Haroldswick. Norwick. Westing. Particularly large-flowered and of a deep indigo colour on the cliffs of Burrafirth and at Spiggie. The leaflets, especially those of the Burrafirth plant, have appressed hairs. I call it forma *pulchra*. It also occurs on the Sands of Barry, Forfar.

688. V. SEPIUM L. Sparingly at upper end of Tingwall Loch, *Beeby* in *Scot. Nat.* 34, 1889. On various holms on Burga Water, etc., 1907; holm in Clousta Water, *Beeby*. Burrafirth, 1920. Bressay. Sandwick. Balta. Norwick. Spiggie. A broad-leaved, luxuriant plant. I suspect once cultivated for fodder.

†697. V. SATIVA L. Alien. Occasionally as a cornfield weed in Unst, Scalloway, *Beeby*.

†698. V. ANGUSTIFOLIA Reich. Unst, *West*.

712. L. MARITIMUS Big. Sand down, Burrafirth, 1837, *E. L.* Abundant in a circumscribed locality on the sands of Burrafirth, *E. Fl.* Abundant, barren, *C. C.* Only a few barren shoots, *Beeby*, 1886. The Shetland plant, not known elsewhere, is named var. *acutifolius* Bab. I have a specimen sent by Edmondston in 1841 to the Bot. Exch. Club, but was unable to find it after several attempts.

714. LATHYRUS PRATENSIS L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Haroldswick, *Tate*. Mid Yell Voe; Burga Water; Tingwall; Scalloway, *Beeby*.

Var. *SPECIOSA Druce in Rep. Bot. Exch. Club 19, 1920, as forma. Differs from the English plant in its much larger flowers—corolla, 16-20 mm. long; flowers 8-10 in a cluster. A form approaching this occurs in Bute. Tingwall. Burrafirth.

[*Pisum sativum* L. Alien. (F.).]

719. L. MONTANUS Bernh. Hill of Voesgarth, Unst; Mavisgrind, North Maven, *E. Fl.*

746. SPIRAEA ULMARIA L. (F.). Unst; Fetlar, etc., generally distributed, *E. L. & Fl.* Belmont, Unst, *C. C.* Mailand!, *Beeby.* Burga Water. Lerwick. Loch of Cliff.

Var. DENUDATA Presl. Mailand Burn, Unst, 1887, *Beeby.*

748. RUBUS IDAEUS L. Ravine of Eala Water burn, *Beeby*, 1892, and *Hb.*

[*R. fruticosus* L. One patch in a pasture field, *West.* This is a corylifolian form escaped from cultivation.]

879. R. SAXATILIS L. (F.). Ollaberry, North Maven, *E. Fl.* Springfield, Unst!; Ronas Hill, 50-1450 ft.!, *Tate.* Balta Sound!, *C. C.* Ken of Hamar!; Clousta Voe, fruiting; on sea banks near Sandsting; Felta Burn, *Beeby.*

Var. BOREALIS West in *Journ Bot.* 300, 1912. A starved form reduced to about an inch high, *West.* This is a barren plant, the underground stem throwing up a leaf at intervals on the serpentine. the leaves being of a purplish-chocolate colour. Tate collected exactly the same plant in 1865 at Buness.

[*Dryas octopetala.* (F.).]

883. GEUM RIVALE L. (F.). West side of Tingwall Loch!, *Beeby* in *Scot. Nat.* 212, 1888. Holm in Sandsting; Mousa Vord Loch, *Beeby.* Common on stream banks, Voe, *Henderson.*

886. FRAGARIA VESCA L. (F.). Unst; Scalloway; Cunningsburgh; Busta, *E. Fl.* Vallafield, Unst, *C. C.*

890. POTENTILLA ANSERINA L. (F.). Common, *E. L. & Fl.* Lerwick, 1865, *Tate.* Yell; Unst, *C. C.* Scalloway; Colvadale; Whiteness Voe, *Beeby.* Haroldswick. Uyea. Fedaland. North Roe. Sandwick. Spiggie. Bressay. Mousa, etc.

Var. *NUDA S. F. Gray. Scalloway. Bressay. Sumburgh. Isle of Balta.

903. P. ERECTA Hampe. (*Tormentilla*). (F.). Common, *E. L. & Fl.* Tingwall, *Tate.* Mousa!; Ronas Hill!; Yell; Unst, *C. C.* Ollaberry, *Beeby.* Bressay. Gallow Hill. Hermaness. Saxavord, etc.

[Var. *nemoralis.* Error. Scalloway, *E. Fl.* Haroldswick (*sic*), *C. C. Tormentilla reptans.* Rare, *E. L.* All doubtless errors for *erecta.*]

[*P. verna* L. (F.).]

907. P. SIBBALDI Hall. f. (F.). Ronas Hill, *E. Fl.*

908. P. PALUSTRIS Scop. (F.). Common, *E. L. & Fl.* Lund!, 1865, *Tate.* Queyfirth; Ollaberry; Asta!, *Beeby Hb.* Spiggie. Scalloway. Laxfirth. Walls. Cunningsburgh. Bressay. Mousa. Uyea Sound. Watlee. Haroldswick. Loch of Cliff.

[909. ALCHEMILLA VULGARIS L., aggregate. Ollaberry, *E. L. & Fl.* xiii. Tingwall, *Tate.* Unst, rare, *West.* These belong to *A. filicaulis* Buser, which I put under *A. minor.*]

908 (2). A. MINOR Huds. (F.). Tingwall, 1865, as *vulgaris*, *Tate* in *Hb. Druce.* Setter Voe in Clousta; Sandsting; Estwick Burn; Ollaberry; holm in a small loch on Gibbies Law Burn; Tingwall; Kirkhouse Burn Voe; Delting; Keryard Burn, Windale; frequent among rocks on Hoo Field, 90 m., as *subsericea, Beeby.* All passed as sub-species *filicaulis* (Buser) by Lindberg, the Hoo Field being var. *vestita* Buser. I could not see it on Hoo Field. Brousta, 1921.

*909 (3). A. ALPESTRIS Schmidt. Balta, Unst, 1921, in a pasture near the Queen's Hotel. Perhaps of garden origin, as I was unable to see it elsewhere, although I was told it was wild in the island. I saw it in gardens.

†910. A. ARGENTEA Don (*conjuncta* Bab.). Alien. On the lawn of the Queen's Hotel, Balta Sound, *Beeby* in *Scot. Nat.* 168, 1907. Still there in 1920 and 1921, but evidently planted. A plant or two was seen in an adjoining pasture.

[*A. faroensis* Buser and *A. acutidens* are found in the Faroes.]

911. A. ALPINA L. (F.). Ronas Hill, *Fl.* xiii. Ronas Hill, at 1000-1460 ft., *Tate.*

912. A. ARVENSIS Scop. Buness, 1865; Balta Voe; Tingwall, *Tate*, 1866. Unst, *C. C.* Sandwick; Hillswick; Skelberry; Balta Sound, *Beeby Hb.* Laxfirth.

[926. *Rosa lutetiana* Lem. Tate's Burrafirth specimen is not *canina*. See Watson, *l.c. R. canina*, one plant at the edge of an enclosed pasture, Unst, *West*, is an alien or error. Beeby's *R. dumalis* (*Scot. Nat.* 214, 1890) is also cancelled. It is a *glauca* form. Restricted *R. canina* needs confirmation.]

934. R. GLAUCA Vill. This is probably the *R. canina* from Ronas Hill of the *Flora*, p. 35, where Beeby found *glauca*. Setter Voe. Clousta. Hamari Water. Burga Water. Cliva Hill. Mavisgrind. East side of Loch of Cliff. In this the armature is very mixed, suggesting the presence of *R. spinosissima*.

Var. SUBCRISTATA (Baker). Edge of cliff, Ronas Voe, *Beeby.*

941. R. TOMENTOSA Sm. Abundant, *E. L.* Burrafirth; Lund; North Roe, *E. Fl.* Very rare.

[*R. mollis* is reported from the Faroes.]

957. PYRUS AUCUPARIA Ehrh. Precipices and cliffs, *E. L.* North Roe!; Ronas Voe!, *E. Fl.* Grud Burn; Björgs of Skelberry. These are the var. *glabra* Trautv. See Beeby in *Scot. Nat.* 214, 1890. On the holm in Hamari Water, flowering and fruiting, 1907; Hostigates, *Beeby*. Ronas Voe, by the Fealburn, 1920. Burga Water.

†966. CRATAEGUS MONOGYNA Jacq. Alien. Planted, Tingwall, *E. L. & Fl.*

975. SAXIFRAGA OPPOSITIFOLIA L. (F.). Sand Voe; Fitful Head, *E. L. & Fl.* Lee of Setter; Fedaland; moor between Skelberry and North Roe, *Beeby Hb.*

[*S. decipiens*, *S. hypnoides*, *S. nivalis*, *S. rivularis*, and *S. stellaris* occur in the Faroes.]

1000. PARNASSIA PALUSTRIS L. Not uncommon, *E. L. & Fl.* Tingwall, *Tate.* Unst, *C. C.* Spiggie, *Beeby.* Balta. Tingwall. Laxfirth. Brousta. Lee of Setter. Bressay.

Var. *CONDENSATA Trav. & Wheld. Spiggie.

†1010. SEDUM TELEPHIUM L. Rare, *E. L.* Collafirth, North Maven; Tresta, Fetlar, *E. Fl.* I only saw it as a garden straggler at Brousta. Alien in Shetland.

[1019. *S. anglicum* Huds. Near Fedaland, North Maven; Colvadale, Unst, *E. Fl.* Needs confirmation.]

1025. S. ROSEUM Scop. (*Rhodiola*). (F.). Common, *E. L.* Not unfrequent on maritime rocks, Burrafirth!; Ronas Voe!, *E. Fl.* Balta Isle!, *Saxby Fl.* Cliffs of Clibberswick. Hagdale. Very beautiful.

[*S. villosum* is recorded for the Faroes.]

1027. DROSERA ANGLICA Huds. (as *longifolia*). Lamhoga, Fetlar; Yell, *E. L.* Burravoe, Yell, *E. Fl.* Rools Burn, near Collafirth, 1890; south side of Roenwater Loch, North Maven, *Beeby.*

1029. D. ROTUNDIFOLIA L. (F.). Not unfrequent, Yell; Bressay; Fetlar; North Maven, *E. L.* Haroldswick, Unst, *E. Fl.* Hermaness!, *Tate.* Ulsta, Yell; Hillswick; Scalloway; Rools Burn, *Beeby.* Saxavord. Watlee. Gallow Hill, etc.

× D. OBOVATA M. & K. Rools Burn, *Beeby*, 1889.

[*D. intermedia*, *Saxby Fl.* It is an error for *D. anglica.*]

1030. HIPPURIS VULGARIS L. Common, *E. L. & Fl.* Unst; Mainland, *C. C.* Mailand Burn!, *Beeby.* Peat moor near Haroldswick. Norwick.

[1032. *Myriophyllum spicatum* L. Given in the *List* but rightly omitted from the *Flora* by Edmondston.]

1033. M. ALTERNIFLORUM DC. (F.). Loch of Cliff, 1865, *Tate.* Uyea Sound!; Little Setter Loch, Yell; Tingwall!, *Tate.* The only form seen, *Beeby.* Spiggie. Bressay. Watlee. Brousta, etc.

1035. CALLITRICHE STAGNALIS Scop. (F.). In a ditch at Bakkasetter, Dunrossness, for the first time, *Beeby* in *Scot. Nat.* 28, 1891. Unst and Ollaberry, *West.* Bressay. Mousa. Uyea Sound. Haroldswick. Watlee, etc.

Var. *SERPYLLIFOLIA Lönnr. Sundabanks. Cliva.

1035 (2). C. PLATYCARPA Kuetz. Loch of Tingwall and elsewhere, *E. Fl.* Balta Sound, *Beeby*. Haroldswick.

[1037. *C. verna* L. Pools and ditches, common, *E. L.* 37, is an aggregate. The segregate needs discovery.]

1038. C. POLYMORPHA Lönnr. In the Mailand Burn, Unst, apparently abundant, *Beeby* in *Scot. Nat.* 212, 1888, and first record for Britain. Burn of Sundabanks, Scalloway!, *Beeby*, 1889. Very sparingly in the Mailand Burn and barren, 1920 and 1921. In small quantity at Sundabanks in fruit, 1921. Near Coultsmill, abundant but mostly barren. Near Haroldswick. Norwick. The large, yellowish-green leaves are distinguishing features. It appears to be confined to slow, peaty streams and ditches. In most instances it was associated with *intermedia* and *stagnalis*.

1039. C. INTERMEDIA Hoffm. (*hamulata*). (F.). Bressay; Unst, etc., *Tate*. Mailand Burn, abundant!; Ollaberry; Eala Water, 1886, *Beeby*. Near Burga Water. Haroldswick.

1040. C. AUTUMNALIS L. (F.). Abundant, *E. Fl.* Loch of Cliff!; Watlee Burn!; Asta!; Tingwall!, *Beeby* in *Scot. Nat.* 213, 1888. Belmont, *Henderson*. Bardister. Near Longa. Spiggie.

1046. EPILOBIUM ANGUSTIFOLIUM L. (F.). Not common, *E. L.* Cliffs, Ronas Hill; Burrafirth, *E. Fl.* Geosetter Burn; St Ninian's Bay, *Beeby*. W. R. Linton refers the Burrafirth plant to var. *brachycarpum*. It is cultivated in gardens. [Flowerless or nearly so in the Faroes.]

1051. E. OBSCURUM Schreb. Fair Isle, *Eagle Clarke* in *Ann. Scot. Nat. Hist.*, 167, 1906.

1054. E. MONTANUM L. (F.). Snarra Voe, Unst, *E. L.* Bel-

mont; Laxfirth, *E. Fl.* Fair Isle, *Straker*. Sundabanks; Bressay; Burravoe; Yell, *Beeby*. On walls at Lerwick. Scalloway. Uyea.

1055. E. ALSINIFOLIUM Vill. (F.). Ronas Hill, *C. C.*, 1870.

1057. E. PALUSTRE L. (F.). Frequent, *E. L. & Fl.* Ness, N. Yell, *Tate*. Unst, *C. C.* Asta Voe!; Breiwick; Saxavord!; Clousta; Collafirth; Tingwall!, *Beeby*. Mousa. Spiggie. Setter. Laxfirth. Sumburgh. Coultsmill. Vinstrick. Burrafirth. Haroldswick, etc.

Var. FONTANUM Hausskn. (F.). With large flowers ($\frac{3}{8}$ in.) on south side of Ronas Voe!, *Beeby*. Spiggie. Tingwall.

Var. LAVANDULIFOLIUM Lec. & Lam. Clickhimmin Loch!; Burrafirth, *Beeby*. Bressay. Coultsmill. Skaa. Vinstrick.

Var. LINEARE Kraus. Bressay. Lund.

[*E. lactiflorum* Hausskn. and *E. alpinum* L. (F.).]

1078. HYDROCOTYLE VULGARIS L. Common, *E. L. & Fl.* Unst; Yell, *C. C.* Scalloway, *West*. Sundabanks!, *Beeby*. Burga Water. Mousa. Dunrossness. Uyea. Haroldswick.

1081. ERYNGIUM MARITIMUM L. Rare. Tangwick, North Maven; east shores of Bressay, *E. Fl.* Fitful Head, *Rev. W. E. Smith*. See *Journ. Bot.* 301, 1884.

[1086. *Conium maculatum* L. Error. Not common. Shady situations, *E. L.* Omitted from the Flora.]

†1103. CARUM CARVI L. Wet meadows, etc., near Mid Yell, etc., *E. Fl.* Clickhimmin, *Tate*. Scousburgh; between Boddam and Exnaboe; Quendal, *Beeby*. Spiggie and Sumburgh, in several places, quite naturalised. Near Jarl's House. Plentiful round the Parish Church, Balta Sound. Doubtless of alien origin although now looking like a native.

1111. SIUM ERECTUM Huds. (*angustifolium*). Asta Burn!, *Beeby* in *Scot. Nat.* 34, 1889.

†1112. AEGOPODIUM PODAGRARIA L. Alien, as in Faroes. Garden weed at Ollaberry, *Beeby*, and at Lerwick and Balta.

1115. CONOPODIUM MAJUS Loret. Voesgarth, Unst, *Tate*, 1886.

†1123. SCANDIX PECTEN-VENERIS L. Alien. Shetland, *Evans* in *Scot. Nat.* 189, 1891.

1126. ANTHRISCUS SYLVESTRIS Hoffm. Common, *E. L. & Fl.* Balta Sound, *C. C.* Widely distributed in Shetland north to Burrafirth as the var. **angustisecta* Druce, as at Spiggie, Sumburgh, Sandwick, Walls, Lerwick, North Roe, Muness Castle, Norwick, Balta, etc.

[1127. *A. Scandix* Beck (*vulgaris*). Error. Abundant, *E. Fl.*]

1144. LIGUSTICUM SCOTICUM L. (F.). Not common, *E. L.* Burrafirth!; Isle of Balta; Maiden Stack, North Maven, *E. Fl.* Hermaness!; Ollaberry, *Tate*. Wick of Hagdale!, *Beeby*. Swinna Ness, Unst; Aith Voe, *Beeby Hb*. Spiggie Voe. Mousa. At Burrafirth and Spiggie it grew in the sand.

1147. ANGELICA SYLVESTRIS L. (F.). Common, *E. L. & Fl.* Loch End; Scalloway, *C. C.* Loch of Cliff; Foula, *Beeby*. The Shetland plant appears to be the var. **decurrens*. It occurs at Spiggie, Dunrossness, Tingwall, Sundabanks, Tingwall, Mousa, Bressay, Saxavord, Hermaness, Skaa, Westing, etc., but the character is not always strongly marked. The unopened inflorescences on a dwarf plant have a strange appearance.

[*Archangelica officinalis* occurs in the Faroes.]

[1151. *Peucedanum sativum* B. & H. Error. Waste ground, not common, *E. L.* Omitted in the *Flora*.]

†1152. P. OSTRUTHIUM Koch. Alien. A patch in the croft of Setter, near Walls, *Beeby*, 1907.

1154. HERACLEUM SPHONDYLIUM L. Common, *E. L. & Fl.* Mid Yell Voe, 1887; Scalloway, a weed of cultivation, *Beeby*. Not unfrequent in rich ground, *Saxby Fl.* Tingwall. Whiteness. Walls. Lerwick. Bressay. Dunrossness. Uyea Sound. Not uncommon.

[1160. *Daucus Carota* L. Error. Abundant, *E. L. & Fl.* Best excluded, *Beeby.*]

†1172. HEDERA HELIX L. ? Alien. On a Pictish Broch, Walls, *E. L. & Fl.* I did not see it.

1174. CORNUS SUECICA L. (F.). At 1400 feet on Sneug, Foula, *Beeby* in *Scot. Nat.* 213, 1888.

†1178. SAMBUCUS NIGRA L. Alien. Only in gardens!, *West.*

1186. LONICERA PERICLYMENUM L. Cliffs, not common, *E. L.* Burrafirth; North Roe; Sundabanks Ravine; near Scalloway, *E. Fl.* Ronas Voe!; Hamari Water; Dall of Lumbister, Yell, *Beeby.* Hoo Field.

1192. GALIUM BOREALE L. Not common, *E. L.* Vallafield Burn, Unst; North Roe, *E. Fl.*

1195. G. HERCYNICUM Weig. (*saxatile*). (F.). Common, *E. L. & Fl.* Bressay!, *Tate.* Unst; Yell; Mainland, *C. C.* Scalloway; Eala Water; Ollaberry; Foula, *Beeby Hb.* Laxfirth. Luxuriant at Setter. North Roe. Mousa. Vallafield. Hermaness.

[1197. *G. uliginosum* L. Error? Frequent, *E. Fl.* and *Saxby Fl.* Sought in vain by Beeby and Druce.]

1198. G. PALUSTRE L. (F.). Common, *E. Fl.* Tingwall; Breiwick, *Tate.* Scousburgh; Clousta, *Beeby.* Laxfirth. Mousa. Uyea Sound. Burrafirth.

Var. MICROPHYLLUM Lange. Loch of Cliff, Unst!; Clickhimmin Loch, *Beeby*, 1886. Watlee.

Var. WITHERINGII (Sm.). Abundant, *E. Fl.* Fair Isle, *Straker.* Loch of Setter, *Beeby.*

1199. G. VERUM L. Common, *E. L. & Fl.* Unst; Yell; Mainland, *C. C.* Tingwall, *Tate.* Ronas Voe, *Beeby Hb.* Hoo Field. Sumburgh. Burrafirth.

1202. G. APARINE L. (F.). Sea shore, common, *E. L.* Balta!;

Uyea; Haroldswick, *Tate*, 1866. Gutcher, Yell; Asta Voe, *Beeby*. Lerwick. Mousa. Haroldswick.

†1207. ASPERULA ODORATA L. Bardister, North Maven, *E. Fl.* Rivulet at Balta Sound, probably a garden escape, *Saxby Fl.* Alien in both cases.

†1222. VALERIANELLA OLITORIA Poll. Colonist, Norwick, Unst, *Tate*, 1866. Still there, 1921.

1237. SCABIOSA SUCCISA L. (*S. pratensis* Moench). (F.). Common, *E. L. & Fl.* Bressay, *Tate*. Unst; Mainland, *C. C.* Near the whaling station and elsewhere it gives a sheen to the landscape, *West*. Burrafirth!; Hamar Voe; Dales Voe!, etc., *Beeby*. Asta. Hoo Field. Bressay. Mousa. Balta Isle.

[*S. arvensis* L. (F.).]

1243. SOLIDAGO VIRGAUREA L. Common, *E. L.* Eala Water, type, on rocks, passing into *cambrica*; Loch of Cliff, *Beeby*. Sundabanks. Lee of Setter. Skaa.

Var. CAMBRICA (Huds.). Dry places on hills, common, *E. Fl.* I should refer no Shetland *Solidago* to Hudson's Welsh plant. I call the condensed cliff and montane form var. *Plukenetiana*. It occurs at Hoo Field, Lee of Setter, and the ravine of the Eala Water.

1248. BELLIS PERENNIS L. (F.). Very common, *E. L. & Fl.* Unst; Yell; Mainland, *C. C.* Balta; Scalloway; Fethaland, *Beeby*. Bressay. Mousa. A fasciated form with two discs occurred at Balta. It was a deep red colour = var. *colorata* Peterm.

1270. ANTENNARIA DIOICA Gaertn. Frequent, *E. L. & Fl.* Muckle Heog!, *Tate*. Unst; Ronas Hill!, *C. C.* Vaila; Whiteness; Balta!; Colvadale!, *Beeby Hb*. Gallows Hill. Haroldswick. Skaa. North Roe.

1274. GNAPHALIUM ULIGINOSUM L. Upper Sound, Lerwick, *E. Fl.* Ollaberry, *Tate*. Haroldswick!, *C. C.* Scalloway, *West*. Fair Isle, *Straker*. Skelberry; Vaara Loch; Sandsting, *Beeby Hb*.

1275. G. SYLVATICUM L. Near the Burn of Sundabanks!, *C. C.*

Ollaberry, *West.* Lochside, Walls; Tingwall!; Whiteness Bay, *Beeby.* Burrafirth!, *Tate.* Ronas Voe. Balta. Haroldswick. Norwick.

[1276. *G. norvegicum* Gunn. Error. Tingwall and Burrafirth, *Tate.* These are *sylvaticum.*]

[1277. *G. supinum* L. (F.). Ronas Voe, *E. Fl.*, xiii. Ignored in Hooker's *Stud. Fl.* Needs confirmation.]

1329. ACHILLEA MILLEFOLIUM L. (F.). Common, *E. L. & Fl.* Lund, Unst, *Tate.* Mainland, *C. C.* Tingwall; Southwick; Uyea; North Maven; Sullum Voe, *Beeby.*

Var. ALPESTRIS Koch. Burrafirth Cliffs, *Beeby.*

Var. LANATA Koch. Fair Isle, *Beeby.* Sandness. Sumburgh.

Forma *ROSEA. Sumburgh, a pretty, neat plant.

1334. A. PTARMICA L. (F.). Frequent, *E. L. & Fl.* Yell; Unst; Mainland, *C. C.* Tingwall!, *Tate.* Mid Yell, *Beeby.* Balta. Lerwick. Bressay.

[1347. *Anthemis Cotula* L. Error. Tingwall, *E. Fl.*]

†1351. CHRYSANTHEMUM SEGETUM L. Lerwick, *E. Fl.* Scalloway, *Beeby.*

†1353. C. LEUCANTHEMUM L. (F.). [Frequent, *E. L. & Fl.* An error.]. In one or two places in Unst, *Mr Sandison.* One plant in a meadow near Ollaberry, 1890; Walls, *Beeby Hb.* Not infrequent near cultivated ground, probably introduced, *Saxby Fl.* Garden ground, Lerwick, 1921. An alien in Shetland and in the Faroes.

1359. MATRICARIA MARITIMA L. Stony shore of North Roe, 1892; Breiwick, *Beeby*, who considers it distinct from *inodora.*

1360. M. INODORA L. Common, *E. L. & Fl.* Lund, *Tate.* Mousa; Unst, *C. C.* Brae; Gulcher, *Beeby.* Lerwick. Bressay.

Var. PHAEOCEPHALA Rupr. (F.). Between Balta Sound and Loch of Cliff!, 1892; Breiwick; West Voe of Sumburgh, *Beeby.* Bressay, *Lester-Garland.* Spiggie. Leafirth. Whiteness. Burga

Water. Uyea Sound. Norwick. Sumburgh. Setter, etc. Often very luxuriant; specimens nearly a yard high at Haroldswick. Flowers attain 50 mm. diameter. The plant is a conspicuous feature.

†1362. M. SUAVEOLENS Buch. Alien. Balta Sound, *West*, 1912. Sumburgh. Frequent at Lerwick. Walls. Scalloway. Ronas. Near the lighthouse station, Hermaness. Scalloway. Sandwick. Uyea Sound. Norwick. Haroldswick.

This North American alien threatens to be a most abundant weed in the islands. It is introduced with fowl-corn.

†1366. TANACETUM VULGARE L. (F.). Alien. Near houses, common, *E. L. & Fl.* Balta Sound, *Tate*. Burrafirth, *C. C.* Wild in N. Yell, *Watson*. Perhaps wild near Bardister, *Beeby*. Setter. Muness. Haroldswick. Uyea. Skaa.

A relic of cultivation or a garden escape.

[†1367. ARTEMISIA ABSINTHIUM L. Alien or error. Quendal; Dunrossness, *E. Fl.*]

1368. A. VULGARIS L. Common, *E. L. & Fl.* Unst; Mainland, *C. C.* Ollaberry; Whiteness; Cunningsburgh, *Beeby*. Sandwick.

Var. *COARCTATA Fors. Norwick.

†1384. TUSSILAGO FARFARA L. (F.). Not common, *E. L.* Tresta, Fetlar; Bardister, North Maven, *E. Fl.* Ollaberry, *Tate*. Scalloway!, *Beeby*. Balta Sound, *Saxby Fl.*, but of garden origin, teste Mrs Saxby, 1920.

†1385. PETASITES OVATUS Hill. Not uncommon [Error], *E. L.* Ollaberry, *E. Fl.* A mistake for *T. Farfara* which grows there, *Tate*. Knabb, Lerwick, *Beeby*. Doubtless introduced. I could not find it in 1921.

1393. SENECIO AQUATICUS Huds. Not rare, *E. L. & Fl.* Mousa; Unst, *C. C.* The *S. Jacobaea* of the *Flora*, described as "far too common but rare in Unst," is doubtless a form of this species. Fair Isle, *Straker*. Scalloway; Sumburgh Loch; Tingwall; Asta; Sandwick, *Beeby*.

Var. *ORNATUS Druce in Rep. Bot. Exch. Club 25, 1920. In July 1921 when entering the harbour of Lerwick one was anxiously trying to identify the first plant of Ultima Thule. Patches of a bright yellow in cultivated soil suggested *Chrysanthemum segetum* but a subtle difference in colour made one doubt. After landing a visit was made to investigate the vegetation more closely when it was found that the colouring was due to another Composite, *Senecio aquaticus*, which, as its name suggests, grows with us in wet and in undisturbed grass of meadows and marshes. Here it chose ground of which the original covering had been removed or in which the soil itself had been disturbed by man. This showy plant, much more ornate than its Southern prototype, was common on the derelict fields around a crofter's cottage, on parts of moorland which had been prepared for corn, on waste places by road-sides, in poor garden ground or the bare stony shores of inland lochs. The plants were usually short, about 8 cm., and had a conspicuous, flat-topped. corymbose inflorescence of larger flower-heads with showy ray-florets of a slightly deeper tone of yellow. As Beeby remarked, "it grows as an inverted pyramid with flat-topped inflorescence." Occasionally the plants are clothed with a hoary or arachnoid tomentum. The lower leaves are usually but little cut, indeed often sub-entire, and are usually green beneath. The capitula are up to 43 mm. across. We saw it not only by Clickhimmin Loch and in waste ground about Lerwick, the Mainland, Tingwall, Whiteness Voe, near Walls and Sandwick, but also in Unst at Burrafirth and Balta Sound. The plant had an unmistakable facies of its own and it seems well worth segregation.

1394. S. JACOBAEA L. The plant of the *Flora* is a form of *S. aquaticus*. One plant in a garden at Balta Sound, 1888; abundant on cliffs east of Scalloway, 1889, denizen, *Beeby*. Still there in 1921. Ollaberry, very local, *West*. Belmont (with some doubt), *Saxby Fl.* Lerwick, one specimen.

A supposed hybrid of *aquaticus* and *Jacobaea* was found by Beeby with both parents at Scalloway. Probably *Jacobaea* is not native in Shetland but was introduced at no very distant date. It is not in the Faroes.

1401. S. VULGARIS L. (F.). Everywhere common, *E. L. & Fl.*

Unst, *C. C.* Scalloway, *Beeby*. Spiggie. Tingwall. Lerwick, too abundant. Bressay. Dunrossness. Sandwick mines. Muness. Balta.

Often as a very stout, upright and rather handsome plant.

1421. ARCTIUM MINUS Bernh., as *A. Lappa*. Rare, but frequent, in Dunrossness, *E. L. & Fl.* Recorded as *A. intermedium* from Sumburgh Links, *Beeby*. See correction in *Ann. Scot. Nat. Hist.* 105, 1909. Near Jarl's House, Sumburgh.

†1422. CARDUUS NUTANS L. Alien. A solitary plant on the beach at Balta Sound, *Evans* in *Scot. Nat.* 189, 1891.

1427. CIRSIUM LANCEOLATUM Scop. Much too abundant, *E. L. & Fl.* Unst, *C. C.* Scalloway, *Beeby*. Lund. Bressay. Mousa.

1433. C. ARVENSE Scop. (F.). Common, *E. L. & Fl.* Unst; Mainland, *C. C.* Dale Voe, *Beeby*. Balta Isle. Recently introduced in the Faroes.

†Var. SETOSUM Mey. Alien. Ness, N. Yell, 1865, *Tate*. Near Brechin, Yell, *A. Griffith*.

1434. C. PALUSTRE Scop. (F.). Common, *E. Fl.* Unst; Yell; Mainland, *C. C.* Ollaberry, *West*. Asta Voe, *Beeby*. Mousa. Bressay.

Var. *FEROX Druce. Balta. Burrafirth. Westring. Tingwall. Sandwick. Delting. Ronas Voe. Laxfirth. Spiggie. Bressay. Rather common.

†1439. ONOPORDON ACANTHIUM L. Alien. Not common, *E. L.* Perhaps introduced, *E. Fl.* Only a garden straggler.

1445. SAUSSUREA ALPINA DC. Ronas Hill, 1837, *E. L.* One specimen in flower, 1889. Somewhat frequent on stony ground about the top, the stem under two inches high, *Beeby*.

1451. CENTAUREA NIGRA L. Alien. Balta Sound, *E. Fl.* Top of low cliffs, Sand Voe, doubtfully indigenous, *Beeby*.

†1454. C. CYANUS L. Perhaps introduced, *E. Fl.* Levenwick, in

the corn crops, *Beeby*, 1907. An adventitious species, not in the Faroes.

1484. LAPSANA COMMUNIS L. Undercliff, western shore of Sullum Voe, near Lunnister, *Beeby* in *Ann. Scot. Nat. Hist.* 54, 1892.

†1497. CREPIS CAPILLARIS Wallr. Alien. As *C. virens*, naturalised within the enclosure of St Magnus Hotel, Hillswick, 1907, but likely introduced in building operations, *Beeby*.

[Edmondston in the *Flora* includes *Hieracium denticulatum* and *H. murorum*, the former from Cliff, the latter from North Roe, but their identity can only be guessed at.]

[1515. *Hieracium flocculosum* Backh. Shetland, *Ann. Scot. Nat. Hist.* 169, 1907, was withdrawn by Beeby. See *l.c.*, 116, 1908. Tate's *H. floccosum* (*Journ. Bot.* 6, 1866) is not this species.]

1540. H. SCHMIDTII Tausch. Cliffs, north side of Ronas Voe, 1890; lower end of Grud Burn, and, as an aggregate, from Clousta northwards, *Beeby*, *l.c.*, 1908.

Var. CRINIGERUM Fr. Björgs of Skelberry; also north side of Ronas Voe, *Beeby* in *Scot. Nat.* 54, 1892. This is probably Tate's *floccosum* of 1866. Hochsetter, *Beeby*.

Var. FEALENSE Beeby. Near the croft of Feal, 1908. This is probably the *lasiophyllum* of Tate (see Syme *E. B.* v., 186), teste *Beeby*, *l.c.*, 112, 1908. Still there in 1920.

[1542. *H. rubicundum* Hanb., var. *Boswelli* Linton Brit. Hierac. Shetland is given on the authority of E. F. Linton. It is referred to *H. Schmidtii* by W. R. Linton. See *Ann. Scot. Nat. Hist.* 116, 1908.]

1553. H. OREADES Fr. Foot of Cliva Hill, *Beeby* in *Ann. Scot. Nat. Hist.* 54, 1892. This is the var. *subglabratum* F. J. H. See *Ann. Scot. Nat. Hist.* 112, 1908. It was thought at one time to be *buglossoides*. The *orimeles* of F. J. H. is the same thing. See *Beeby*, *l.c.*, 116, 1908.

[1565. *H. murorum* L. North Roe, *E. Fl.* This is a mistake for *Schmidtii*.]

Var. MICRACLADIUM (Dahlst.). Among crags, west of Feal. This is the plant formerly referred to *duriceps*, teste *Beeby*, *l.c.*, 112, 1908.

1591. H. FARRENSE F. J. H. North side of Ronas Voe in two places; opposite Heylor, among crags, 400-450 ft., 1892, *Beeby*.

[1598. *H. duriceps* F. J. H. See var. *micracladium*, yet W. R. Linton, *l.c.*, 235, 1906, gives Shetland, and Beeby, *l.c.*, 169, 1907, says he has found it but supplies no details.]

[1607. *H. maculatum* Sm. *E. Fl.* It is *H. protractum*.]

1617. H. DOVRENSE Fr. Common about the north end of Loch of Cliff and Burrafirth in 1886 and 1887, teste Hanbury, *Beeby* in *Scot. Nat.* 35, 1889. But see *Ann. Scot. Nat. Hist.* 55, 1892, where it is said to be *Friesii*. Hanbury, 1895, says *dovrense* grows on the east banks of Loch of Cliff.

Var. HETHLANDIAE F. J. H. Cliva Hill Rocks, in some plenty!, 1907; Mavisgrind; Burn of Quoys; Catfirth, *Beeby*.

1618 (2). H. BREVE Beeby in Ann. Scot. Nat. Hist. 112, 1908. On granite rocks west of Feal, very rare, *Beeby*, *l.c.* This seems a good species, but I only saw two specimens in 1920. Allied to the Kerry *H. Scullyi*.

1619. H. ZETLANDICUM Beeby in Journ. Bot. 243, 1891. East side of Sand Voe on low hills and banks; low hills east of North Roe!; towards the Ness of Burravoe, *Beeby* in *Ann. Scot. Nat. Hist.* 55, 1892. Confined to North Maven to an area of 2 by 1 miles on gneiss, extending from Burga Taing north to Benegarth, *Beeby*, *l.c.*, 113, 1908. A very distinct species, in nice flower, August 1921.

1621. H. DEMISSUM Strömf., var. PULCHELLIFORME W. R. L. (as *H. pulchellum* in *Scot. Nat.* 35, 1889). Burrafirth; N.-E. bank of Loch of Cliff; by Queyhouse Loch, *Beeby*, *l.c.* In nice flower 1920 and 1921.

Var. AUSTRALIUS Beeby. Loch of Cliff; Burrafirth Cliffs (Tate's *crocatum*), *Beeby*, *l.c.*, 114, 1908.

1622. H. PROTRACTUM Lindeb. Abundant about east side and

north end of Loch of Cliff! (west bank, *Hanbury*, 1895); Dall of Lumbister and Mid Yell Voe; rocks north of Mavisgrind!; Cliva Hill!, 1892; in many places from Unst and Yell southwards to Sandsting and Aithsting, 1908, *Beeby*. Probably the *maculatum* of the *Flora*, and the *vulgatum* of Tate.

[1623. H. TRUNCATUM Lindeb. The Cliva Hill plant (see *Brit. Hierac.* 75) proved to be *dovrense*, var. *Hethlandiae*, but Beeby, *l.c.*, 169, 1907, says he has found the true plant, and W. R. Linton states Shetland is the only genuine record (*Ann. Scot. Nat. Hist.* 235, 1906). Beeby later described *subtruncatum*, which may mean this.]

1623 (2). H. SUBTRUNCATUM Beeby, *l.c.*, 114, 1918. Abundant on the ferny and rocky banks of Eala Water down to its mouth in Hamar Voe, *Beeby*. Still plentiful there.

[1625. *H. gothicum* Fr. Shetland, *Brit. Hierac*, 77. Lacks authority.]

[1626. *H. stictophyllum* Dahlst. "I have seen specimens from Shetland from Beeby."—*Dahlstedt*. Beeby has no specimen so labelled in his herbarium. See *Ann. Scot. Nat. Hist.* 169, 1907, and 116, 1908, so it is excluded.]

1630. H. RIGIDUM Hartm., var. FRIESII Dahlst. Hamar Voe; Eala Water Burn; banks of Gluss Burn; near Ollaberry, abundant; north end of Loch of Cliff, *Beeby*, *l.c.*, 55, 1892, and 115, 1908.

1632. H. STRICTUM Fr. Shetland, *Beeby*, *l.c.*, 169, 1907. This is the var. *humilius* Beeby, *l.c.*, 115, 1908. Gelli Gill, near Hillswick; Sandsting; holm in Hamari Water, *Beeby*.

1634. H. AURATUM Fr. Ronas Voe and Mavisgrind, *Beeby*, *l.c.*, 55, 1892. (This may include or represent *crocatum*, var. *thulense*.).

1635. H. CROCATUM Fr. [Burrafirth, *Tate*. This is *protractum*.]. North Roe; Ronas Voe, *Beeby*.

Var. VINACEUM Beeby, *l.c.*, 115, 1908. In many places on the north side of Ronas Voe!, *Beeby*.

Var. CONGESTUM Beeby, *l.c.* Burga Taing; North Roe; holm in Burga Water, *Beeby*.

Var. THULENSE (Beeby, *l.c.*, 115, 1908, under *auratum*) mihi. Abundant on the north side of Ronas Voe!; sparingly on the south side; rocks a mile north of Mavisgrind, *Beeby*. See also *l.c.*, 55, 1892. To me this is not an *auratum* form, so I place it here.

Twenty-two micro species of Hieracia are found in the Faroes. Not one of the Shetland plants is recorded. See Dahlstedt in Warming's *Botany of the Faroes* 625.

1640. HYPOCHOERIS RADICATA L. South side of Dales Voe, *Beeby* in *Scot. Nat.* 215, 1890. Unst, in one place, *West*. Seafield, Lerwick, in some quantity in a lane traversed by cattle.

1643. LEONTODON AUTUMNALE L. (F.). Common, *E. L. & Fl.* Unst; Mainland, *C. C.* On Ronas Hill; Scalloway; Yell; Sumburgh; Burrafirth, *Beeby*. So abundant in a field near Haroldswick as to be noticeable for miles.

Var. TARAXACI (L.)=var. PRATENSIS Koch. Hoo Field. Watlee.

1645. TARAXACUM VULGARE Schrank. (F.). Local. Common, Lerwick, *E. Fl.* Walls, etc., *Beeby*. Scalloway. Balta, etc.

[1646. T. PALUDOSUM Schlecht. (as *palustre*). Marshy places on the hills, abundant, *E. Fl.* This is only an aggregate name and may be incorrect.]

1646 (2). T. SPECTABILE Dahlst. Particularly frequent in Sandsting; never on cultivated land. Previous records of *palustre* belong here, *Beeby* in *Ann. Scot. Nat. Hist.* 169, 1907. First British record. Burga Water!; Mill Loch of Uyea; Nesting; Housetter, Unst; Limbister, Yell, *Beeby*. Bressay. Scalloway. Lerwick. Balta Sound, etc.

Var. GEIRHILDAE (Beeby, as sub-sp., *l.c.*, 105, 1909). Loch of Girlsta; east side of Lang Klödi Loch, North Maven; and elsewhere in Nesting and Weisdale; Burn of Quoys; Catfirth, on rocks in the Ravine, *Beeby*. This prefers grassy sides of burns or wet places on the hills. Lerwick. Burga Water. Hoo Field. Gallow Hill. Watlee.

Var. MACULIGERUM (Dahlst.). South Loch of Hostigates and

Clousta; Skula Water; Bridge of Walls, *Beeby*. Lerwick. Balta. Scalloway.

(Many plants are in the hands of Dr Dahlstedt for identification.)

1656. SONCHUS ARVENSIS L. (F.). Common, *E. L.* (omitted in *Flora*). Unst; Yell; Mainland, *C. C.* Scalloway; Balta, *Beeby*. Lerwick. Bressay. Sumburgh. Uyea. Haroldswick, etc.

1657. S. ASPER Hill. Occasionally to the exclusion of *oleraceus*, *Beeby*, 1889. Scalloway; Whiteness; Unst, *Beeby Hb*. Lerwick. Balta Sound.

Var. *PUNGENS Bisch. Scalloway.

1658. S. OLERACEUS L. Frequent, *E. L. & Fl.* Unst, *C. C.* Uncommon; garden weed at Boddam, *Beeby*. Scalloway. Balta Sound. Hardly naturalised.

1664. LOBELIA DORTMANNA L. (F.). Little Setter Loch, Yell; Ronas Hill; Tingwall Loch!; Burra Voe, *Tate*, 1866. Ollaberry, *West*. Helliers Water, Unst, *Beeby Hb*. Burga Water.

1666. JASIONE MONTANA L. Common, *E. L. & Fl.* The type not common. A small form of it between Ronas Voe! and Hillswick; Hildasay; Foula, *Beeby*.

Var. LATIFOLIA Pugsley (*major* Beeby). Common on cliffs by the sea and inland, Burrafirth, *Tate*, 1865. Loch of Cliff!; Ollaberry; Scalloway!, *Beeby*. Spiggie. Hermaness. Lee of Setter, etc.

Forma PALLIDA. Bressay. Mousa.

1675. CAMPANULA ROTUNDIFOLIA L. (F.). Near Laxfirth, *E. Fl.* Between Skelberry and Boddam, 1907, *Beeby*. Very rare.

1684. VACCINIUM ULIGINOSUM L. (F.). Hermaness!, *E. Fl.* Ronas Hill, 600 ft., *Tate*. Saxavord!, *C. C.* Foula, *Beeby*. Very abundant on Hermaness, but almost always barren.

Forma *MICROPHYLLA Lange Consp. Fl. Groenl. 268. Saxavord.

1685. V. MYRTILLUS L. (F.). Common, *E. L. & Fl.* Ronas Hill, *Tate*. Unst, *C. C.* Dales Voe; Bonxie Hill!; Scalloway, *Beeby*. Hoo Field. Balta. Hermaness. Skaa.

Var. (or forma) MICROPHYLLUM (Lange). Saxavord, *Beeby*. This is probably the *pygmaea* of Ostenfeld.

1686. V. VITIS-IDAEA L. (F.). Ronas Hill, *C. C.*, 1868. Abundant on Hoo Field and Bonxie Hill, 800-960 ft., Cunningsburgh, *Beeby*.

Var. MINOR. Ronas Hill; Hoo Field, *Beeby*.

1690. ARCTOSTAPHYLOS UVA-URSI Spreng. Ronas Hill, *E. Fl.* 200-600 ft., *Tate*. Sae Water; Bergs of Kilbarn; Rools Burn, *Beeby*.

1691. A. ALPINA Spreng. Ronas Hill, *E. L.* 200-1800 ft., *Tate*. Sae Water, North Maven, 250 ft., *Beeby*. Yell, a very large plant on the undercliff, *A. Griffith*.

1693. CALLUNA VULGARIS Hull. (F.). Very common, *E. L. & Fl.* Ollaberry, *Tate*. Unst; Yell; Mainland, *C. C.* Culswick; Walls; Gluss Water; Asta Loch!; Foula; Voesgarth Hill!, etc., *Beeby*. Bressay. Mousa. Hoo Field, etc.

Forma *ALBA. Hoo Field.

1694. ERICA CINEREA L. (F.). Common, *E. L. & Fl.* Burrafirth, *Tate*, 1865. Unst; Yell; Mainland, *C. C.* Hillswick; Ronas Voe, *Beeby*. Bressay. The flowers are smaller than the usual southern plant.

1695. E. TETRALIX L. Frequent on dry moors, *E. L. & Fl.* Ronas Hill!, *Tate*. Unst; Yell; Mainland, *C. C.* Burrafirth!; Hillswick, *Beeby*. Bressay. Mousa.

Var. *FISSA Druce. Corolla polypetalous, petaloid stamens, *Tate*. Balta, on serpentine.

1702. LOISELEURIA PROCUMBENS Desv. (*Azalea*). (F.). Ronas Hill, *E. L.* Plentiful there, *C. C.*

1708. PYROLA MEDIA Sw. Walls, *E. Fl.*

[*P. minor* L. is recorded for the Faroes.]

1713. LIMONIUM VULGARE Hill. Knabb, near Lerwick, two or three specimens, *E. L. & Fl.*, as var. *longifolium*. I could not see it.

1721. STATICE PUBESCENS (Link) Druce = S. LINEARIFOLIA Lat. = ARMERIA MARITIMA. Frequent, *E. L. & Fl.* Unst; Yell; Mainland, *C. C.* A viviparous form, Sand Voe, 1906; Burrafirth; Burravoe; Grud Burn, *Beeby Hb.*

In 1887 Beeby recorded a small form as *sibirica* Turc., but in 1888 said it was not true *sibirica*. The Thrift is very variable, some of it coming under var. *scotica* Boiss., and is generally distributed and abundant, especially on the rocky islets.

1721 (2). S. PLANIFOLIA (Syme) Druce. Hill of Hamar!; near Balta Sound; Springfield!; east side of Sand Voe on rocks, *Beeby*. Cultivated side by side with type since 1898. In addition to recorded characters it flowers three weeks earlier than type, *Beeby*, *l.c.*, 233, 1907. As Mr Clement Reid has shown, this seems to be a good species. I am able to corroborate Beeby's statement as to the earlier flowering.

[*S. maritima*, *sibirica*, and *elongata* are recorded from the Faroes and should be sought for.]

1725. PRIMULA VULGARIS Huds. (F.). Common, *E. L.* Lund!, Unst; Ollaberry; Bardister!; Reafirth; Mid Yell; near Cunningsburgh!, etc., *E. Fl.* Burravoe, *Tate*. Tingwall!; Dales Voe!, *Beeby*. Petester!; near Olligarth House; Whiteness, *Saxby Fl.* Burn of Sundabanks. Cliva. Eala Water. Hoo Field. Mousa, in flower in August.

1740. TRIENTALIS EUROPAEA L. Hermaness, Unst, *E. L. & Fl.* Foula, *R. M. Barrington*. Noss, *Beeby*, 1898. Braefield, Dunrossness, *Mrs J. M. Saxby*. Very small specimens, my var. *nana*. See *Rep. B.E.C.* 75, 1882.

1741. GLAUX MARITIMA L. Common, *E. Fl.* Yell; Unst, *C. C.* Balta Voe!, *Tate*. Asta Voe; Tangwick; Collafirth, *Beeby*. Sumburgh. Virkie. Bressay.

1744. ANAGALLIS TENELLA Murr. (F.). Norwick, Unst; Sound, Lerwick, *E. Fl.* Burrafirth, *C. C.* Spiggie; Grasswater, *Beeby*.

[*Lysimachia nemorum* L. (F.).]

1755. CENTAURIUM VULGARE Rafn. = ERYTHRAEA LITTORALIS. Sullum Voe; Tangwick; North Maven, *E. Fl.*

[1756. *C. umbellatum* Gilib. = *Erythraea Centaurium*. Belmont, Unst, *E. Fl.* Very dubious.]

1763. GENTIANA AMARELLA L. Not common, *E. L.* Generally distributed on limestone and sandy pastures; Cliff and Burrafirth; Balta Island!; Tingwall!; Dunrossness!, *E. Fl.*

Forma MULTICAULIS Lange. Burrafirth sands and adjacent banks!; Sconsburgh, *Beeby*.

The Shetland *Gentiana Amarella* is sufficiently distinct from the English form as to be worth designating *G. septentrionalis* nova subsp. or race. The plants are usually more branched. The colour of the corollas is quite different. Externally they are of a pale dull red, while internally the lobes are whitish, either with a trace of dull rose, or very pale grey, but the effect conveyed when they are fully expanded on a sunny day is of pale whitish stars, and is quite beautiful. There is no suggestion of the bluish-purple which is characteristic of the English plant. When the calyx-segments are as long as the corolla as I have seen at Burrafirth and on the Caithness coast at Reay, etc., it is the var. *calycina* (given under *Amarella*, but should be transferred to *septentrionalis*, to which it more correctly belongs). Under *septentrionalis* also comes the Shetland var. *multicaulis*.

1765. G. CAMPESTRIS L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Burravoe!; Ronas Voe!; Balta Sound!; Brough of Setter!; Fair Isle?; a curious form, Fetlar, *Beeby*. Spiggie. Laxfirth. Mousa. Hoo Field. Scalloway. Eala Water Burn. Tingwall. Whiteness. Brousta. Ness of Sound. Uyea Sound. Lund. Balta. Burrafirth, etc.

The plant is variable. Much of the Shetland plant is apparently the var. *baltica* (Murb.).

Sub-var. ALBA. Whiteness. Weisdale. Balta. Mousa.

1766. MENYANTHES TRIFOLIATA L. (F.). Abundant, *E. L. & Fl.* Burrafirth, *Tate*. Unst; Mainland, *C. C.* Mailand Burn, Unst;

Scalloway!; Ollaberry, *Beeby*. Cunningsburgh. Spiggie. Lunga. Ponds Water. Lund. Haroldswick. Uyea Sound, etc.

*†1791. SYMPHYTUM TUBEROSUM L. Garden escape, Lerwick, *Mrs Wedgwood*, 1921.

1805. LYCOPSIS ARVENSIS L. (F.). Common, *E. L. & Fl.* Unst; Sand Lodge, *C. C.* Clickhimmin, *Tate*. Quendal Bay; Whiteness; Clousta; Burrafirth, *Beeby*. Cunningsburgh. Lerwick. Norwick, abundant. Balta.

1811. PNEUMARIA MARITIMA Hill (*Mertensia*). (F.). Not common, *E. L.* Sullum Voe; Tangwick; Sand Lodge, *E. Fl.* Bardister Voe, North Maven; Hillswick, *Tate*. Loch End, *C. C.* Skaa, Unst, *Saxby Fl.* Breiwick, 1896; Fetlar; Sandness; Gluss Voe; Aith Voe, *Beeby*. Spiggie Voe, 1921.

1813. MYOSOTIS PALUSTRIS Hill. Frequent, *E. Fl.* [Error.] Unst, *C. C.* Near Uyea, but perhaps from a garden.

Var. STRIGULOSA (Reichb.). (F.). Abundant about Hillwell Loch and thence towards Loch Brue, etc., *Beeby*. Spiggie. Uyea.

1814. M. REPENS Don. (F.). Bressay; Haroldswick!, *Tate*, 1866. Everywhere common. Sandsting; Sand Voe; Grasswater; Tingwall!; Ronas Voe!; Sandwick; Hillswick, *Beeby*. Dunrossness, *Wm. Saxby, jun.* Spiggie. Lerwick. Bressay. Uyea. Watlee.

Forma ALBA. Watlee.

Forma PALLIDA. Haroldswick.

1815. M. CESPITOSA Schultz. Burrafirth; Norwick!, *E. Fl.* Between Ronas Voe and Hillswick!; Clickhimmin Loch!; Scalloway!; Fair Isle, etc., *Beeby*. Ollaberry, *West*. Sumburgh.

The Unst plant often has very pale flowers. In the Orkneys the colour is usually darker than the English plant.

1819. M. SCORPIOIDES L. (*arvensis*). (F.). Common, *E. L. & Fl.* Haroldswick, as *collina;* Buness, *Tate*. Unst; Ollaberry, *West*. Tangwick; Clousta; Scalloway!, *Beeby*. Spiggie Voe. Tingwall. Brousta. Lerwick. Setter. Bressay. Muness. Norwick.

[1820. *M. collina* Hoffm. Abundant, *Tate*. Sought in vain. *Beeby*. Small *arvensis* mistaken for it.]

1821. M. VERSICOLOR Sm. (F.). Shetland, *Tate*. Unst, *C. C.* Loch of Cliff!; Baliasta, *Beeby*. Lund!, *Saxby Fl.* Spiggie. Ness of Sound. Burrafirth. Norwick.

Var. *LUTEA (Pers.). Balta Sound, 1920. Bressay, 1921.

*†1831. VOLVULUS SEPIUM Jung. Alien. (F., as a garden weed.). Balta Sound, 1921.

[1839. *Cuscuta Epithymum* Murr. East side of Loch of Cliff, *Saxby Fl.* Surely an error of identification.]

†1898. MIMULUS GUTTATUS DC. Alien. Clickhimmin Loch, 1886; Brue Loch, Dunrossness, as *M. lutea*, *Beeby*. In the Mailand Burn, 1920.

1907. VERONICA OFFICINALIS L. (F.). Common, *E. Fl.* Unst; Mainland, *C. C.* Ronas Voe; Hoo Field; Björgs of Skelberry; Breiwick; Scalloway; Burn of Sundabanks!; Brousta Loch!, *Beeby Hb.* Tingwall. Laxfirth. Bressay. Ness of Sound. Watlee, etc.

Var. ALLIONII. On Ronas Hill. Larger than preceding, quite glabrous, notch of capsule narrower, *E. Fl.* 16.

Var. RIGIDA E. L. Common on waste ground. Leaves very rigid, not serrated, whole plant glabrous, capsule distinctly winged. See *Journ. Bot.* 301, 1884, where Mr Ridley records a small-flowered form approaching var. *hirsuta* (Hopk.) but with broader leaves. On Hoo Field Mr Beeby found a form with truncate, not notched, capsule, but the preceding year's capsule was normal. See *Scot. Nat.* 36, 1889.

1908. V. CHAMAEDRYS L. Lerwick; Sandwick, *E. Fl.* Needs confirming.

[1909. *V. montana* L. Ollaberry, *E. L.* Error.]

1910. V. SCUTELLATA L. Bressay, 1866, *Tate*. Loch of Lumbister, Yell; Grasswater; Sandwick; Flatpond Loch; Walls; Clousta; Skula Water; Strad of Aithness; Asta Burn; near Burga Water; E. Innes Burn, Yell, *Beeby*. All the glabrous plant.

1911. V. BECCABUNGA L. (F.). Tingwall!, *E. L. & Fl.* As a minute form, Asta Burn; Flemington; Weisdale, *Beeby Hb.*

1912. V. ANAGALLIS-AQUATICA L. Brook near Laxfirth, *E. L.* Tingwall!, *E. Fl.* Asta Burn!; ditch at Exnaboe!; Laxfirth; Strand Loch; Flemington, *Beeby.* Dunrossness. Cunningsburgh. Near Virkie. The true *Anagallis.*

1914. V. SERPYLLIFOLIA L. (F.). Common, *E. Fl.* Unst, *C. C.* Hamna Voe, Walls; Wester Quarffs; Tingwall!; Scalloway!, *Beeby Hb.* Dunrossness, *Wm. Saxby, jun.* Lerwick. Balta.

1919. V. ARVENSIS L. Abundant, *E. Fl.* Scarpoe, Unst; Lerwick!, *Tate.* Seal; Balta!, *Beeby Hb.* Scalloway.

[*V. alpina* L. and *V. fruticans* Jacq. (F.).]

†1923. V. TOURNEFORTII Gmel. Alien. Abundant at Boddam, 1891, *Beeby.* Balta Sound, in garden ground, 1921.

†1924. V. AGRESTIS L. Bressay, *Tate*, 1865. Unst, 1868, *C. C.* Seal; Balta, *Beeby Hb.* Scalloway, 1920.

†1925. V. DIDYMA Ten. Ollaberry, North Maven, *Beeby.* See *Top. Bot. Suppl.*

1926. V. HEDERIFOLIA L. (F.). Common, *E. Fl.* Seal; Balta!, *Beeby.* Scalloway. Muness, etc.

[*Euphrasia officinalis* L. Everywhere common, *E. Fl.* Var. *exigua* is in all probability *E. micrantha* Reichb. = *gracilis* Fr.]

1932. EUPHRASIA BOREALIS Wettst. (F.). Ollaberry, *Beeby.* See *Ann. Scot. Nat. Hist.* 233, 1907. Sand Voe; Hillswick; Walls!; Tingwall!; Asta!; North Roe!; Sullum Voe; Springfield, Unst!, *Beeby*, who found it in 1887. If the limitations assigned for this plant by Scandinavian botanists are adopted, it is one of the commonest and most showy of the Shetland Eyebrights. Under it I am, however, convinced there are two or three distinct plants. As an aggregate it is very widely distributed, and in many cases it is a

most attractive and abundant plant. Spiggie. Sumburgh. Scalloway. Lee of Setter. Cliva. Ronas Voe. Eala Water Burn. Sandwick. Stroma Loch. Virkie. Cunningsburgh. Lerwick. Bressay. Mousa. Whiteness. Hoo Field. Walls. Tingwall. Asta. Burga Water. Brousta. Balta Isle and Sound. Haroldswick. Norwick. Burrafirth. Gallow Hill. Clibberswick. Uyea. Watlee. Colvadale.

*1933. E. BREVIPILA Burn. & Gremli. Rare. Tingwall, 1920. Norwick. Balta. Saxavord.

1934. E. NEMOROSA H. Mart. Burrafirth; Saxavord; Loch of Cliff; moors about Ollaberry, *Beeby* in *Scot. Nat.* 214, 1888. Grasswater, *Beeby*, 1890, teste *Townsend*. See *Mon.* 26. Uyea Sound. Skaa.

1935. E. CURTA Wetts. (F.). Springfield, Unst; Hamar Voe; Grasswater, *Beeby*. Tingwall. Norwick.

Forma PICCOLA (Towns. in Ann. Scot. Nat. Hist. 177, 1902). Hjogs, Balta Sound, on serpentine at 200 ft., *Beeby*. Scalloway, 1921.

*1936. E. OCCIDENTALIS Wettst. Very rare. Clibberswick, 1921. Messrs Pearsall and Lumb thus name it.

1937. E. LATIFOLIA Pursh = E. ARCTICA Lange. (F.). With white flowers, *West*. Very rare. Scalloway. Balta Sound.

1938. E. FOULAENSIS Towns. (F.). *E. gracilis* Fr., f. *atropurpurea* (Rostr.) Ostenf. = *E. atropurpurea* (Rostr.) Ostenf. in *Bot. Faroes* 55, ? if of Rostr. Banks of Loch of Cliff!, 1888; Burrafirth; Vord Hill, Unst; Foula on Hammarfeld; 1000-1200 ft., Ollaberry; Collafirth; Grasswater; Fitful Head; Hillswick; Mavisgrind!; Queyfirth, *Beeby*. Locally abundant and widely distributed. Laxfirth. Tingwall. Burga Water. Scalloway, and as a very dwarf form on gravelly soil. Ness of Sound. Lee of Setter. Cliva. Whiteness. Stroma. Eala Water Burn. Bressay. Mousa. Balta Sound and Isle. Colvadale. Burrafirth, etc. Sometimes very dwarfed = forma *nana* mihi, as on the coast at Scalloway and on a hill top near Skail, Orkney.

1938 (2). E. MINIMA Fr. (F.). Saxavord; Fitful Head; Burra-

firth; Houllma Water; Uyea; North Maven; Sand Voe, *Beeby*. All determined by Ostenfeld. This includes much, if not all, of the Shetland *scotica* and *foulaensis*, which Ostenfeld considers come under it. I am not convinced about its being true *minima*.

1939. E. MICRANTHA Reichb. *E. gracilis* Fr. *E. officinalis*, var. *exigua*, *E. Fl.* (F.). Collafirth, 1881; Ollaberry, *Beeby*. Balta. Near Sandfield. Haroldswick. Watlee. Muckle Heog. Hill of Hamar.

1940. E. SCOTTICA Wettst. (F.). Frequent, Hamar Voe; Hillswick; Ollaberry; Urafirth Voe; Fair Isle, *Beeby*. Asta. Scalloway. Whiteness. Eala Water. Bressay. Hoo Field. Ronas Voe. Burga Water. Uyea Sound. Watlee. Loch of Cliff. Balta Isle. Saxavord. Hill of Hamar. Mousa. Under this comes a slender, very small, and purplish-flowered plant.

1941. E. ROSTKOVIANA Hayne. Ollaberry, a large-flowered, glabrous form, *Beeby* in *Scot. Nat.* 213, 1888. Burrafirth, 1920. Referred to this species by Mr Lumb. It is an extraordinary plant, 2 in. high, branched, with small leaves and flowers.

Dr Jurgensen, the Norwegian authority on Euphrasias, has commented on the Shetland specimens I had sent him. He says he has had no opportunity of comparing them with the rich material in the Museum at Bergen, but he considers Euphrasias can only be studied well in nature. A few specimens picked out give no reliable result. "Nevertheless," he writes, "I have been glad to see your specimens, which perhaps show that the denomination *E. borealis* and *E. scotica* with you do not agree exactly with my use of them. On the other side, our Scandinavian *E. gracilis* Fries (*E. micrantha* Reichb.) occurs in a typical form in your collection. Your plants queried *E. suecica* are not what we call so in Scandinavia. The Swedish form is very similar to *tenuis*, and may generally only be separated from this species by the want of glands. Your Shetland plant is a form of that species which I have called *E. borealis*. The blunt teeth of the leaves also show it belongs to that species. In Norway we have the same species all along the west coast, and on the other hand we have the nearly related

species *E. stricta* here and there in the rest of the country, especially in the south-eastern regions, but there without the early flowering *E. suecica*. The latter form is rare with us, and generally not so well differentiated as in Sweden. On the other hand, in the area of our *borealis* we have, except in the northern part, well differentiated early-flowering forms which I have called × *E. atlantica*. They are very similar to × *E. suecica*, but belong in my opinion to *borealis*, not to *stricta*. These two species seem, however, with us to transgrade into each other by intermediate forms growing more inland, where there is a hotter summer. Your specimens are, however, not my × *atlantica*. As to *foulaensis*, please read my treatise pp. 135, 150, 151, and 240. I have seen different forms from our west coast, which I have referred to that species apparently standing between early flowering forms of *E. micrantha* and *E. borealis*. Also in your material forms occur which seem to connect these two species. However, as *E. borealis* with us has proved to be very variable in regard to the size of the flowers, I have not listed *E. foulaensis* as a separate Norwegian species. This may account for the close alliance between your queried *suecica* and *foulaensis*. *E. scotica* is with us very characteristic, as a little dark-coloured, but pale-flowered species from wet ground on the west coast, forming a connecting link between our *minima* and *micrantha*. Townsend accepted my determination for a great number of specimens. But we have also a larger, greener form, pointing at *borealis*, and that, I think, is nearer to Townsend's type specimens. The small-flowered eglandular form is very striking. . . . In course of time I hope to return to the study of Euphrasias, and shall then try to describe as separate species all those which in nature seem to be distinguishable without regard to Wettstein's [species]. That should also be done with the British Euphrasias."

1948. BARTSIA ODONTITES Huds. Unst, *Peach*, 1864. East side of Unst, *C. C.*

*Var. LITTORALIS (Reichb.). Virkie. New to Mainland, 1921.

[*B. alpina* L. (F.).]

1949. PEDICULARIS PALUSTRIS L. (F.). Frequent, *E. L. & Fl.*

Lerwick, *Tate*. Yell; Mainland, *C. C.* Clousta Water; Bardister!, *Beeby*. Spiggie. Setter. Bressay. Tingwall. Walls. Haroldswick. Virkie.

1950. P. SYLVATICA L. Common, *E. L. & Fl.* Bressay!, *Tate* and *C. C.* Unst; Mainland; Tingwall!; Asta!; Bardister!, *Beeby*. Eala Water. Hoo Field. Mousa. Haroldswick.

1951. RHINANTHUS MAJOR Ehrh. Yell; North Maven, *E. Fl.* Ringasta, 1891, *Beeby*. Balta Sound, new to Unst, 1920.

1952. R. CRISTA-GALLI L., aggregate. (F.). Common, *E. L. & Fl.* Unst; Mainland, *C. C.* Small form on the peat, large form on cliffs north of Saxavord (*groenlandicus*), *Beeby* in *Scot. Nat.* 27, 1887. Brousta; Twart Burn; Hillswick; Clousta Voe; Upper Clubbi, *Beeby*.

Var. *RUSTICULUS (Chab.). Tingwall, 1920. Bressay.

1954. R. STENOPHYLLUS Schur. Cornfield, Balta Sound; Sand Voe; Clousta and by Clousta Voe, 1909; Walls, *Beeby*. Spiggie. Stroma. Ronas Voe.

*1955. R. MONTICOLA Druce. Watlee. Balta. Burrafirth.

*1956. R. BOREALIS Druce. Balta.

1957. R. DRUMMOND-HAYI Druce. (F.). Hillside, Benegarth, North Roe, 1907; Clousta; Voesgarth; *Beeby*. Hoo Field. Balta. Springfield.

1957 (2). R. GROENLANDICUS Chab. Cliffs of Saxavord!; Burga Water. Exactly the plant of the Faroes, *Beeby* in *Ann. Scot. Nat. Hist.* 233, 1907. First British record. Still on the holm in Burga Water from which T. Churchill, who swam across, brought me specimens in both 1920 and 1921.

*1960. MELAMPYRUM PRATENSE L. One specimen in flower on the north-east side of Saxavord at 750 feet, 1921. First record for Zetland. It probably belongs to the var. *montanum* (Johnst.). It had pale yellow flowers and was less than two inches high.

1975. UTRICULARIA VULGARIS L. (F., flowerless.) Scarce. Bressay; Ronas Voe; Scalloway, *E. Fl.* Spiggie; Cloka Burn; Brue Loch, *Beeby*. Probably all these belong to *U. major*.

*1976. U. MAJOR Schmid. Bardister, 1920. Tingwall, 1920. Loch of Cliff, Unst, 1921. Flowerless in all cases.

1977. U. INTERMEDIA Hayne. Pools about Loch Brue; Loch Spiggie (*sic*); pools on the Cloka Burn; Bunya Water, *Beeby*, *l.c.*, 29, 1891. Probably some, if not all these, belong to the next species.

1977 (2). U. OCHROLEUCA Hartm. Loch of Spiggie, *Beeby*, as *intermedia*. Ronas Hill. Walls.

1978. U. MINOR L. Abundant in pools on the Cloka Burn; Bunya Water; Burga Water, *Beeby*, 1891. Unst; Ollaberry, *West*. Aithness (very doubtful); Walls; Punds Loch, *Beeby*. Tingwall Loch, 1920.

1980. PINGUICULA VULGARIS L. (F.). Common, Yell, etc., *E. L. & Fl.* Bressay, *Tate*. Unst; Mainland, *C. C.* Ollaberry; Gluss Burn; Ronas Voe, *Beeby*. Sundabanks. Lee of Setter. Hoo Field. Mousa. Watlee. Lund.

Var. MINOR Koch.? Otterswick, Yell, *Beeby*.

1991. MENTHA SPICATA L. (*viridis*). Alien. Bardister; Ronas Voe, *E. Fl.* Burn of Skaa, Unst, *Beeby*. Still there as a garden escape, 1921, and interesting from the fact of a small patch existing so long.

1994. M. AQUATICA L. (F.). Tingwall!, *Beeby* in *Scot. Nat.* 36, 1889. Spiggie!; Loch Brue; Fair Isle, *Beeby*.

2008. THYMUS SERPYLLUM L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Keen of Hamar; Collafirth, *Beeby*. Bressay. Mousa. Sandwick. Sumburgh, etc.

Var. PROSTRATA Hornem. (F.). About Ronas Voe; Ollaberry, *Beeby*. Hoo Field.

Var. ALBA. Hoo Field. Spiggie.

[2034. *Nepeta Cataria* L. Alien or probably an error. Sandsting Parish, *E. Fl.*]

[2036. *N. hederacea* Trev. (F.). Sand Voe, *E. Fl.* xiii. I only saw it in gardens. Needs confirming.]

2044. PRUNELLA VULGARIS L. (F.). Common, *E. L. & Fl.* Buness, Unst, *Tate*. Mainland, *C. C.* Balta; Eala Water!; Queyfirth; Twart; Sandwick, *Beeby*. Ollaberry, *West*. Dunrossness, *Wm. Saxby, jun.* Haroldswick. Spiggie. Bressay. Mousa.

[2056. STACHYS SYLVATICA L. Error? North Maven; Lerwick, *E. Fl.* Not seen by Beeby or myself.]

†2056. × S. AMBIGUA Sm. Tingwall, *E. L.* and *Tate*. Bressay, *E. Fl.* Scalloway!, 1888, proves sterile in culture, *Beeby*, 1891. Asta. Lerwick. Burrafirth. Haroldswick. In all cases probably of garden origin. It is a frequent garden plant in the isles.

2057. S. PALUSTRIS L. Common, *E. L. & Fl.* Unst; Ollaberry, *West*. Laxfirth. Burrafirth. Norwick, etc.

*Var. CANESCENS Lange. Loch of Cliff. Norwick.

2062. GALEOPSIS TETRAHIT L. (F.). Very common, *E. L. & Fl.* Unst; Mainland, *C. C.* Bressay, *Tate*. Ollaberry, the form with pale purple flowers, *West*. Baliasta; Scalloway, *Beeby*. Common in the crops and under three distinct modifications.

Var. *BIFIDA (Boenn.). Burrafirth. Norwick. Lerwick. Brousta. Setter. Sumburgh. Sandwick, scarcely typical, but it is the southern *Tetrahit*.

2071. LAMIUM PURPUREUM L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Ollaberry, *West*. Scalloway!; Clousta; Fair Isle, *Beeby*. Bressay. Spiggie. Tingwall. Sandwick. Walls. Norwick. Balta, etc.

2072. L. HYBRIDUM Vill. (F.). Common, *E. Fl.* Lerwick!, *Tate*, 1865.

2073. L. MOLUCCELLIFOLIUM Fr. = L. INTERMEDIUM Fr. (F.). Not common, *E. L.* Tingwall!; North Maven, *E. Fl.* Norwick!;

Skaa!; Unst; Bressay, as *purpureum*, 1865, *Tate*. Scalloway!, *Beeby*. Walls. Spiggie. Cunningsburgh. Ness of Sound. Uyea.

2083. AJUGA REPTANS L. Common, *E. L.* Ollaberry; Ronas Voe; Scalloway, *E. Fl.* Neither Beeby nor I have seen it.

2090. PLANTAGO CORONOPUS L. (F.). Common, *E. L. & Fl.* Bressay, *Tate*. Mousa!; Unst; Mainland, *C. C.* Always with the leaves flat on the ground, Ollaberry, *Beeby*. Spiggie. Balta Isle. Westring. A very variable plant, extremely responsive to conditions of soil and exposure.

Var. PYGMAEA Lange. Hamna Voe, *Beeby*, *l.c.*, 28, 1887.

2091. P. MARITIMA L. (F.). Common, *E. L. & Fl.* At 1476 ft., Ronas Hill!; Muckle Heog!, *Tate*. Plants one inch high on Ronas Hill were thought by West to be var. *lanata* (*sic*). Edmondston recognised the variability of the Sea Plantain and suggested a division into two species:—(1) *P. maritima* proper, with narrow, lanceolate, smooth, erect leaves and cylindric spikes, and (2) *P. setacea*, with leaves cylindric or semi-cylindric, lying flat on the ground and with globular spikes, and under this a var. *lanosa* with the base of the leaf woolly. This latter is common on the serpentine and also on exposed rocky places, especially on the border of coast cliffs. The name may be retained as *P. maritima* L., var. *lanosa* (Edm.), which is in great part the *hirsuta* of Syme. It occurs on the Knabb, Lerwick; Hoo Field; Ronas Hill; Mousa; Lee of Setter; Skaa; Saxavord; Hermaness; Watlee; Colvadale; Clibberswick; Westring, etc.

Forma PROCERIOR Lange. A plant with long, erect, pale green leaves. Burrafirth cliffs, *Beeby* in *Scot. Nat.* 28, 1887.

Var. PYGMAEA Lange. Arisdale Burn, on alluvial grit; Hamna Voe, *Beeby*.

Var. *PUBESCENS mihi. Ordale, Balta. Has the long leaves of the type, but strongly pubescent. The bases are not clothed with silvery white hairs as in *lanosa*.

Var. DENTATA Koch. Bressay, *Tate*. Tingwall Loch side, *Beeby*.

2091. P. EDMONDSTONII Druce in Rep. B.E.C. 41, 1920. Root very long, branching as it nears the soil-surface into many

(up to 20) subsidiary stems, each bearing 1-3 scapes. Rootstock above the ground, stout, woody, up to 2½ inches high, bearing crowded, unequally 3-4 nerved leaves, the lamina up to 1½ inches long, lanceolate, rather fleshy, thickly covered with shaggy, white, loosely appressed hairs, especially on the under surface, with a quantity of white tomentum at the leaf-base and on the short petiole. Scape up to 5 inches high, strongly but shortly hairy. Spike ⅜-1 inch long by ¼ inch broad. In several places on the serpentine at Balta Sound as at Springfield, Keen of Hamar. Near Loch Watlee. Clibberswick. This was much larger and had a very conspicuous rootstock, which was covered for some portion of its length with dry leaves of many preceding years. This gave it the appearance of a branch of *Araucaria*, since the crowded leaves were lanceolate, narrowed to a short point, and covered with a silvery pubescence. It had all the appearance of a very distinct species. The variation is, apparently, not due to soil or exposure, since narrow, hairy-leaved plants grew near as well as narrow-leaved glabrous plants except for the white hairs about the rootstock. Two suggestions occurred to one as this wind-swept barren tract of serpentine was traversed. Was this a distinct species crossed with other forms of *P. maritima*, thus giving rise to the great number of intermediate plants, or could it be that *P. lanceolata* entered into its composition and transmitted its pubescence and its broader leaves to the offspring, which have a more pronounced root-stock, fleshier leaves and other strong evidences of *maritima*? In either case the extraordinary variability of the Plantains here might be accounted for. Provisionally, I distinguish this curious plantain by the name of *P. Edmondstonii* in honour of the boy-botanist who discovered *Arenaria norvegica* on the very place where this plantain grows. Further research may prove it to be a hybrid. The plants had no ripe seeds. Several species, however, rarely seed in these northern latitudes. Into this might be merged the broad-leaved forms of var. *hirsuta* Syme and var. *minor* Hooker. Each of the trivials is rejected on account of the confusion arising from their use, and it is by no means ascertained that the Shetland plant is identical with Gilibert's *hirsuta*. The Orkney plant is less pronounced than the Balta Sound specimens, and some may prefer to use the name *minor* for these small plants under *Edmondstonii*. The specimens in our public herbaria give no idea

of the latter plant. A second year's observation strengthens my opinion that it is *maritima* × *lanceolata*. Many plants connect it with *maritima*, and some of the more extreme approach *lanceolata*. Indeed, a distinguished Scandinavian botanist was inclined to put them under *lanceolata*.

2092. P. LANCEOLATA L. (F.). Very common, *E. L. & Fl.* Unst; Mainland, *C. C.* Uyea; Clousta; Ollaberry, *Beeby*. Bressay. Mousa. Balta Isle. A very variable species.

Var. DEPRESSA Rostr. Fl. Dan. t. 3008. Sea sands, Sandwick!; Benegarth; Scalloway!, in many places, chiefly in sand but not confined to it, leaves very broad, *Beeby*. Spiggie. Sumburgh. Lund.

Var. CAPITATA Presl. Common about Burrafirth sands and Loch of Cliff; Ollaberry, the common form of rocks and sandy places, *Beeby*. To this may be referred the var. *montana* Edmondst., with leaves scarcely striate; spike globose, few-flowered. In cultivation the characters are not permanent. To it also goes var. *sphaerostachya* Roehl, which seems to be the older name.

Var. ERIOPHYLLA Dcne. Burrafirth!; Ronas Voe, *Beeby*. Springfield. Hagdale. Watlee. Balta.

Var. or forma REPENS (Lange). With a long rhizome, bearing tufts of leaves and flower stems at intervals, Mid Yell Voe, *Beeby* in *Scot. Nat.* 28, 1887.

A monstrous condition was found by Beeby at Sconsburgh, Exnaboe, and Cliva, also a proliferous form at Spiggie in 1907. See *Ann. Scot. Nat. Hist.* 233, 1907.

[2098. *P. media* L. Error. Scalloway, *E. Fl.* This is the var. *depressa* of *lanceolata*.]

2099. P. MAJOR L. Common, *E. L. & Fl.* Unst, *C. C.* Ollaberry, *West*. Bressay, *Tate*. Very common, but often as the following variety.

Var. INTERMEDIA (Gilib.). The usual form of stony loch-sides, Clickhimmin; Tingwall, *Beeby*. Bressay. Mousa. Balta.

2101. LITTORELLA UNIFLORA Asch. Common, *E. L. & Fl.* Clickhimmin!, *Tate*. Unst, *C. C.* Scalloway; Neugles Water, *Beeby*. Watlee. Uyea. Spiggie. Tingwall. Burga.

†2124. CHENOPODIUM ALBUM L. (F.). Abundant, *E. Fl.* Ollaberry, *West.* Spiggie; Levenwick, *Beeby.* Balta. Scalloway.

Var. VIRIDE (L.). East side of Unst, *C. C.*

[2138. *Beta maritima* L. Bressay, *E. Fl.* I could not see it. Probably an error.]

2144. ATRIPLEX PATULA L. (F.). Common, *E. L. & Fl.* Lerwick!; Scalloway!, *Beeby.* A maritime form at Balta Voe, *Beeby* in *Scot. Nat.* 215, 1888. Spiggie. Sandwick. Balta.

Var. ERECTA (Huds.). Scalloway, *Beeby.*

Var. *BRACTEATA Wester. Lerwick!, *Tate*, 1865.

2147. A. HASTATA L. (F.). A common weed at Balta Sound!, 1907; Lerwick!; Fair Isle, *Beeby.* Spiggie. Uyea.

Var. *OPPOSITIFOLIUM Moq. Near Spiggie. Haroldswick.

[2148. *A. deltoidea* Bab. Abundant, *E. Fl.* Var. *prostrata* Bab. Balta Sound, *E. Fl.* Need confirming.]

2149. A. GLABRIUSCULA Edmonst. (F.). Balta Sound, *E. Fl.* Scalloway; Gutcher; Clickhimmin!; Balta!; Urafirth Voe, etc., *Beeby.* Cunningsburgh. Bressay. Mousa.

Forma PARVULA. Swinna Ness, Scalloway, *Beeby.*

Var. BABINGTONII (Woods) Druce. (F.). The *A. rosea* of the *Flora*, where it is described as common on sea shores. Balta Voe!; Gutcher; Scalloway!, *Beeby.* Haroldswick, very young, *Tate.* Spiggie. Bressay. Uyea. Cunningsburgh. Burrafirth.

2150. A. MARITIMA Hall. *A. laciniata* auct. *A. rosea* Woods. [Common on sea shores, *E. Fl.* Error for *Babingtonii.*]. Clayval, Dunrossness, on a sandbank, 1899, *Beeby.*

2158. SALICORNIA EUROPAEA L., aggregate. Frequent, *E. L.* Dales Voe; Balta Sound; Sullum Voe, etc., *E. Fl.* It was too immature in 1921 to decide the segregate.

2166. DONDIA MARITIMA Druce (*Suaeda*). Common, *E. Fl.* Balta Sound!, *Tate.* Haroldswick.

Var. PROCUMBENS (Syme) Druce. Balta Voe!, abundant, *Beeby.*

[2171. *Polygonum Bistorta* L. Broo, Dunrossness, *E. L.* Omitted in *Flora.*]

2172. P. VIVIPARUM L. (F.). Gallow Hill; Uyea Sound, *E. Fl.* Isle of Balta!, *Peach.* Isle of Uyea!, 15 ft.; Ronas Hill, 1476 ft., *Tate.* Sea bank, Lee of Setter; top of Hamar Voe, *Beeby.*

Var. ALPINA Wahl. Lee of Setter, *l.c.*, 216, 1890. With the type but keeping distinct. Root-leaves often orbicular or broadly oblong-oval; bulbils bright golden-yellow, *Beeby.*

[*P. Convolvulus* L. Alien in the Faroes.]

2173. P. AMPHIBIUM L. (F.). Common, *E. Fl.* Lerwick; Unst, *C. C.* Loch of Cliff, *Tate.* Fair Isle, *Straker.* Colvadale, *Beeby.* Spiggie. Hoo Field. Abundant at Norwick, forming a large part of the vegetation in a hay field, as the so-called var. *terrestre* Leers.

2175. P. PERSICARIA L. Frequent, *E. L. & Fl.* Tingwall Loch; Easter Quarff; a handsome cornfield plant at Aith Voe; Levenwick; Lerwick, *Beeby.* Rare.

[2177. *P. Hydropiper* L. Frequent, *E. Fl.* Not seen by Beeby or myself.]

[2182. *P. Raii* Bab. Common, *E. Fl.* Burrafirth, *C. C.* Needs confirmation.]

2184. P. AVICULARE L., aggregate. (F.). Frequent, *E. L. & Fl.* Unst, *C. C.* The segregate, *P. heterophyllum* Lindm. is the common form. It is in *Beeby Hb.* from Clousta; Aith Voe; Scalloway; Sandwick; Brousta Voe. I saw it at Bressay, Mousa, Balta Isle, Lerwick, Scalloway, Walls, Haroldswick, Ronas Voe, Spiggie, Uyea Sound, etc. Beeby records var. *agrestinum* (Jord.) from Scalloway, Tingwall, and Cunningsburgh.

Var. LITORALE Koch=MARINUM S. F. Gray. Bressay; Norwick, *Tate.* Cunningsburgh, *Beeby.* Uyea Sound, as forma **grandiflora*, a robust plant.

*2184 (2). P. AEQUALE Lindm. Scalloway, 1920. Haroldswick. Uyea Sound, with rose-coloured flowers.

[*Koenigia islandica.* (F.).]

2194. OXYRIA DIGYNA Hill. (F.). South side of Ronas Voe!, abundant over a restricted area, from sea level to 30 ft., 1890. *Beeby.*

2196. RUMEX LONGIFOLIUS DC. *R. domesticus.* (F.). Very common, *E. Fl.* Unst; Mainland, *C. C.* Abundant, Ollaberry, *Tate*, 1865. Tingwall; Scalloway; Ronas Voe!; Baliasta; Balta!, *Beeby.* Walls. Bressay. Mousa. Sumburgh.

× R. CONSPERSUS Hartm. (F.). Baliasta; Balta Sound!; Asta Voe, *Beeby* in *Scot. Nat.* 29, 1891. Walls. Bressay.

2198. R. CRISPUS L. (F.). Common, *E. L. & Fl.* Buness, Unst, *Tate.* Balta. Tingwall. Scalloway. Walls. Bressay. Mousa.

× R. PROPINQUUS Aresch. = CRISPUS × LONGIFOLIUS. Scalloway, *l.c.*, 300, 1890; Balta; Tingwall, 1891, *Beeby.*

× R. ACUTUS L. = CRISPUS × OBTUSIFOLIUS. Upper end of Tingwall Loch, *Beeby* in *Scot. Nat.* 29, 1891. Edmondston says it is common, but his plant is doubtless a *longifolius* hybrid.

2200. R. OBTUSIFOLIUS L. (F.). Unst; Ollaberry, *Tate*, 1866. Unst, *C. C.* Baliasta; Scalloway, *Beeby.* Bressay.

2209. R. ACETOSA L. (F.). Very common, *E. L. & Fl.* Lerwick, *Tate.* Unst, *C. C.* A dwarf form, 1-2 in. high, on the top of Saxavord, *Beeby.* Bressay. Mousa. Balta Isle.

2210. R. ACETOSELLA L. (F.). Very common, *E. L. & Fl.* Lerwick, *Tate*, 1865. Yell; Clousta; Ronas Voe, *Beeby.* Bressay. Mousa.

Var. ANGIOCARPUS Murb. Clousta, *Beeby.*

Var. ACETOSELLOIDES (Bal.). Sand Voe; Clousta; Chamerwick; Dunrossness; Burrafirth!, *Beeby.* Huesbreek.

†2225. EUPHORBIA HELIOSCOPIA L. Alien. Common, *E. L. & Fl.* Unst, *C. C.* Tingwall, *Beeby.* Laxfirth. Scalloway.

†2235. E. PEPLUS L. Alien. Boddam, abundant as a garden weed, 1891, *Beeby.* Scalloway, 1920.

2250. URTICA DIOICA L. (F.). Very common, *E. L. & Fl.* Scalloway; Browland Voe, *Beeby*. Bressay. Mousa. Balta Isle. The inflorescence is often very dark purplish-brown.

2251. U. URENS L. (F.). Frequent, *E. Fl.* Unst; Lerwick, *C. C.* Ollaberry, *West*. Scalloway!, *Beeby*. Spiggie. Sandwick Mines. Norwick.

2255. BETULA ALBA L. Unst, *Edmondston*, 1841. See also *New Stat. Acc.* 1841. Not seen by me. Beeby has had remains of it from the peat.

†2258. ALNUS GLUTINOSA Gaertn. Alien. As "Elder" in the mountains of Shetland, *Gordon Stat. Acc.* 1794. Planted, Lerwick, *C. C.* By the inn at Tresta, *Beeby*. Only as a planted tree.

2260. CORYLUS AVELLANA L. Hazels . . . are found in the mountains, *Gordon*, *l.c.*, 1794. In many of the islets . . . in the lochs, *Bryden New Stat. Acc.* 1841. Nuts are found in the peat. Now extinct?

†2268. SALIX FRAGILIS L. Alien. Loch End, *Beeby*, planted.

†2273. S. STIPULARIS Sm. Alien. Shetlands, *W. R. Linton*, but if so, planted.

†2274. S. SMITHIANA Willd. Alien. Planted in a croft at Loch End, *Beeby*.

2275. S. CAPREA L. Holm in Mousa Vord Loch, 1907, *Beeby*. Somewhat doubtful. Linton thought it was *Caprea* × *cinerea*; Ostenfeld, *cinerea*.

2276. S. AURITA L. Plentiful, *E. L. & Fl.* Loch of Cliff!; Hamar Voe; Burga Water; Eala Water!; Gluss Burn; Tingwall!; Lee of Setter!; Ollaberry, *Beeby*. (Tate's Burrafirth *cinerea* is *aurita*). Queyhouse Loch.

× S. AMBIGUA Ehrh. Between Burrafirth and Loch of Cliff!. *Scot. Nat.* 28, 1887; slopes above Sand Voe; Eala Water!, *Beeby*.

2277. S. CINEREA L. (*aquatica*. E. L. & Fl.). [Near Bardister,

North Maven, *E. Fl.* Error.]. Unst, *C. C.* Abundant, Muckle Mill, Loch of Uyea, 1909, *Beeby*.

2278. S. REPENS L. Common, *E. L. & Fl.* Mousa; Ollaberry, *Tate*. Unst, *C. C.* Wick of Hagdale!; Hamar Voe; Eala Water!; Hillswick; Setter Voe; Clousta; Saltness; Walls, *Beeby*. Dunrossness, *Wm. Saxby, jun.* Bressay. Mousa, plentiful. Watlee.

Var. INCUBACEA (Sm.). Mousa, *Dr M'Nab* in *E. Fl.*

Var. ARGENTEA (Sm.). Uyea; North Maven, *E. Fl.* Ollaberry, *Tate*.

Var. *PARVIFOLIA Sm. Watlee.

2285. S. HERBACEA L. (F.). Ronas Hill, 1841, *E. L.* Fair Isle, 700 ft.; Saxavord!, 938 ft., *Tate*, 1866. Foula, common; Goafirth Loch, Delting; Björgs of Uyea; Dall of Lumbister, *Beeby*.

[*Salix glauca* and *phylicifolia* are recorded for the Faroes.]

2290. POPULUS TREMULA L. Ronas Voe, near Feal!, *Beeby*.

[2291. *P. nigra* L. Scalloway; Walls; Busta; Cunningsburgh, *E. Fl.* An error for *tremula*, or planted.]

2295. EMPETRUM NIGRUM L. (F.). Common, *E. L. & Fl.* Common in Unst; Ronas Hill!, from sea level to 938 ft., *Tate*. Hoo Field!; Cunningsburgh; Ollaberry; Foula, *Beeby*. Sea level at Laxfirth. Burga Water. Scalloway. Lee of Setter. Watlee Loch side. Skaa.

[2301. *Malaxis paludosa* Sm. (F.).]

2306. LISTERA CORDATA Br. (F.). Scatsta; hills above Lerwick; Ronas Hill, *Tate*, 1866. West side of Vallafield, Unst, *Saxby Fl.*

[2325. ORCHIS LATIFOLIA L. (F.). Frequent, *E. L. & Fl.* Balta Sound, *C. C.* Loch of Cliff; Queyfirth; near Ollaberry; Collafirth; Foula, *Beeby*. This seems made up of two or more species and is only an aggregate name. I have not seen any plant which I should call *latifolia* from the Shetlands.]

2326. O. INCARNATA L. This alone is given for Shetland by Trail in *Ann. Scot. Nat. Hist.* 230, 1906. Some of the foregoing belong here.

*2326. O. PRAETERMISSA Druce. Spiggie. Noss, W. H. St Quintin.

Var. *PULCHELLA Druce. Loch of Cliff. Balta Sound. Burrafirth. Whiteness. Tingwall, 1920. Spiggie. Laxfirth. Walls. Brousta. Ness of Sound. Setter. Hoo Field. Haroldswick. Colvadale. This is Tate's *O. mascula* from Bressay, 1865.

* × MACULATA (*latifolia* auct., p.p.). Spiggie. Laxfirth. Whiteness. Dunrossness. Cunningsburgh. Burrafirth.

*2326 (3). O. PURPURELLA Steph. Bressay. Balta.

2327. O. MACULATA L., vera. (F.). Frequent, *E. L. & Fl.* Balta, *C. C.* Ronas Hill; Skelberry; Fair Isle, probably, *Beeby*. Bressay, *Tate*. Scalloway. Bressay. Mousa. Haroldswick. Norwick. Watlee. Hoo Field. Gallow Hill.

Var. *MACROGLOSSA Druce. Brindister. Ness of Sound. Bressay. Haroldswick. Gallow Hill.

2329. O. MASCULA L. (F.). Frequent, *E. L. & Fl.* Balta, *Straker*. Tate's specimen is *O. praetermissa*, var. *pulchella*.

2338. HABENARIA GYMNADENIA Druce (*G. conopea*). North Roe, North Maven, *E. Fl.* Unst, rare, *West* and *Beeby*. Small specimens, with dark coloured flowers, at Balta Sound, 1920-21. Skaa. Clibberswick.

[2339. *H. albida* Br. (F.). Bressay, *E. Fl.* Needs confirmation.]

2340. H. VIRIDIS Br. (*Coeloglossum*). (F.). Common, *E. L.* Tingwall!; Fetlar, *E. Fl.* Balta Sound!, *C. C.* Hillswick. Hamar Voe. North Maven. Voesgarth. Ness of Sound. Gallow Hill. Mousa, etc.

Var. *OVATA Druce. Balta Sound, on the serpentine. Watlee. Clibberswick. Hoo Field. Mousa. This is Tate's *viridis* from Muckle Heog.

2349. IRIS PSEUDACORUS L. (F.). Common, *E. L. & Fl.* Haroldswick, Unst, *Tate.* Lerwick, *C. C.* The prevailing form is *acoriformis*, *Beeby*, *l.c.*, 235, 1907. Colvadale; Hamar Voe; Tingwall; Fair Isle, *Beeby.* Spiggie. Bressay. Mousa.

2408. SCILLA VERNA L. (F.). Shetland, *Neill.* Very common, *E. L. & Fl.* Unst!; Lerwick; Ronas Hill, *C. C* Ollaberry; Hillswick; Fair Isle, *Beeby.* Balta Sound. Whiteness. Spiggie. Laxfirth. Brousta. Hoo Field. Mousa, two specimens in flower in August 1921.

†2411. S. NON-SCRIPTA H. & L. Alien. Waste ground, Balta Sound, *E. Fl.* Garden outcast!, *Tate.*

*†2415. LILIUM PYRENAICUM Gouan. Alien. Near Cliff, by a stream, doubtless washed down from a garden.

2423. NARTHECIUM OSSIFRAGUM Huds. (F.). Abundant, *E. L. & Fl.* Unst; Yell; Mainland, *C. C.* Tingwall, *Tate.* Scalloway; Clousta; Balta Sound, *Beeby.* Spiggie. Bressay. Mousa. Lund. Uyea.

[*Tofieldia palustris* Huds. (F.).]

2428. JUNCUS CONGLOMERATUS L. (F.). Very common, *E. Fl.* Unst, *C. C.* Ollaberry; Clickhimmin; Clousta; Roerwater, scarce, *Beeby.* Very scarce, *Saxby Fl.* Bressay. Mousa.

2429. J. EFFUSUS L. (F.). Common, *E. L. & Fl.* Ronas Voe; Collafirth; Valladale; Slovabreck; Hillswick, *Beeby.* Burrafirth. Haroldswick. Uyea. Lee of Setter. Spiggie, etc.

Var. *SPIRALIS M'Nab. Ronas Voe, 1920. Cunningsburgh. Mousa. Loch of Cliff. Haroldswick.

[2430. *J. inflexus* L. (*glaucus*). Lerwick, *West.* Requires confirmation.]

2434. J. SILVATICUS Reich. Abundant, *E. Fl.* Not seen by Beeby. Ollaberry; Unst, in some places very dwarfed, *West.*

[*J. subnodulosus*, *J. balticus*, and *J. biglumis* are recorded from the Faroes.]

2435. J. ARTICULATUS L. (*lamprocarpus*). (F.). Pools and ditches, *E. Fl.* Common, Hamna Voe; Uyea; North Maven; Tingwall; Colvadale; Fair Isle, *Beeby*. Bressay. Mousa. Watlee. Hoo Field. Asta, etc.

2437. J. BULBOSUS L. (*supinus*). (F.). As *J. uliginosus*, abundant, *E. L. & Fl.* Unst, *C. C.* Voesgarth Hill!; Scalloway; Fair Isle; Queyhouse Loch, *Beeby*. Lund. Burrafirth. Eala Water. Spiggie, etc.

Var. KOCHII (F. S.) Druce. Slopes of Saxavord, *W. R. Linton*. Near Haroldswick. Bressay. Mousa.

Forma SUBMERSA. Asta. Watlee.

2438. J. SQUARROSUS L. (F.). Very common, *E. L. & Fl.* Skaa, *Tate*. Lerwick, *C. C.* Hermaness; Hillswick, *Beeby*. Top of Saxavord. Bressay. Mousa. Balta Isle.

[2439. *J. compressus* L. *E. L. & Fl.* An error for *Gerardi*.]

2440. J. GERARDI Lois. (*coenosus*). Salt marshes, *E. Fl.* The *J. compressus* is an error for this species. Ollaberry, *Tate*. Whiteness Voe; Uyea Sound; Queyfirth!; Hamna Voe; Clousta Voe, *Beeby*. Spiggie. Laxfirth. Bressay. Lund.

Var. *GRACILIS Druce. A very slender form, near Lerwick. 1920.

2442. J. BUFONIUS L. (F.). Common, *E. Fl.* Ollaberry, *West*. Unst, *C. C.* Sand Voe; Ronas Voe!; Lerwick; Hildasay; Loch of Cliff, *Beeby*. Bressay. Mousa. Balta Sound, etc.

2446. J. TRIGLUMIS L. (F.). Ronas Hill, *E. L. & Fl.* Colvadale, abundant, at 200-300 ft., 1888, *Beeby*.

2448. J. TRIFIDUS L. (F.). Ronas Hill, 1868, *C. C.* [The *trifidus* of Edmondston's *List* is an error.]

2449. JUNCOIDES SYLVATICUM (Huds.)=LUZULA. (F.). Fre-

quent, Ronas Hill; Scalloway; Vallafield; Hermaness, etc., *E. Fl.* Saxavord!, *Tate.* Sundabanks!, *C. C.* Burga Water!; Loch of Cliff, *Beeby.* Eala Water. Hoo Field. Ronas Voe. Petister. Skaa.

Var. GRACILE (Rostr.). (F.). Upper slopes of Saxavord!, flowering on the small plateau; Hermaness, profusely, but barren; Fitful Head, 1890; Hammerfield, 1100 ft., Sneug, 1400 ft., Foula, flowering, *Beeby.*

2452. J. PILOSUM Morong. (F.). North Roe; Fedaland, *E. Fl.* Eala Water; Breiwick; Scalloway; Vaila Isle; Lerwick; Skelberry; Foula, *Beeby.* Burga Water.

2454. J. MULTIFLORUM Druce. Ronas Voe, 1886, *Beeby.* Tingwall; Unst; Ollaberry, *West.* Bressay. Watlee. Saxavord.

Var. CONGESTUM Druce. Hermaness, *C. C.* Hillswick; Upper Clubbi; Collafirth, *Beeby.* Bressay. Mousa. Lund. Haroldswick.

2456. J. CAMPESTRE Morong. (F.). Common, *E. L.* Bressay; Haroldswick; Unst, *Tate.* Everywhere common. Queyfirth; Ollaberry; Cliff, *Beeby.* Hoo Field. Bressay. Mousa. Balta.

2458. J. SPICATUM (L.) Druce. (F.). Ronas Hill, 1868, *C. C.*

[*J. arcuatum* occurs in the Faroes.]

[2463. *Sparganium ramosum* Huds. Lerwick, *C. C.*, 1868. Requires confirmation.]

2464. S. SIMPLEX Huds. Common, *E. L.* Tingwall, *E. Fl.* xii.
Var. LONGISSIMUM Fries. Burn of Burrafirth, *Beeby*, 1886.
× NATANS. Burn of Burrafirth, *Beeby*, 1889.

2465. S. NATANS L. (*affine*). (F.). Abundant, *E. L.* Tingwall; Loch of Cliff, *Tate*, 1866. The common species, Burn of Burrafirth!; Ustaness Loch; Scalloway; Housesetter; Mailand Burn!, *Beeby.* Brousta, 1920.

Var. ZOSTERIFOLIUM (Neum.). Mailand Burn!, *Beeby.* See *Scot. Bot. Rev.* 94, 1912. Watlee Burn.

2466. S. MINIMUM Fr. Tingwall, *E. Fl.* Mailand Burn, *Beeby* in *Scot. Nat.* 37, 1889. Grasswater Loch, Walls, *Beeby*. Henry's Loch.

2482. TRIGLOCHIN MARITIMUM L. Frequent, *E. Fl.* In a small bog by the Kergova Burn at 110 ft. and 2½ miles from sea, 1909, *Beeby*. Uyea Sound. Bressay.

2483. T. PALUSTRE L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Ollaberry; Clousta Voe; Walls; Scalloway, *Beeby*. Spiggie. Lund. Sumburgh.

2485. POTAMOGETON NATANS L. (F.). Common, *E. L. & Fl.* Loch of Cliff!, *Tate*. Ronas Voe!; Asta!; Uyea!; Ollaberry, *Beeby*. Tingwall. Henry's Loch. Watlee.

2486. P. POLYGONIFOLIUS Pourr. (F.). Bressay, 1865, in *Hb. Druce*; Skaa; Unst!, *Tate*. Deep water form between Eala Water and Collafirth!; narrow leaved state, Hillswick; Scalloway!; Laxdale; Culswick; Hillswick; Sandsting; Ollaberry; Neugles Water, *Beeby*. Ponds Water. Watlee. Uyea Sound. Haroldswick.

Var. CANCELLATUS Fryer. In the burn from Brousta Water, *Beeby*, *l.c.*, 29, 1891. Thought by him to be *polygonifolius* × *heterophyllus*. It produces scarcely any floating leaves. It grows chiefly in a sort of backwater where the water eddies a little but is tolerably still. The less coriaceous floating leaves in their veining recall *coloratus*. In very small quantity in 1920 and 1921, but sufficient to dispel any suggestion of hybridisation. In this Dr Hagström agrees.

The heath form (*ericetorum* Syme) is a common plant.

[2489. *P. alpinus* Balb. (F.). ? × *P. gracilis* Wolfg. Recorded as *P. Wolfgangii* Kihlm. by Beeby in *Scot. Nat.* 217, 1890, from the Loch of Lumbister, Yell. A supposed hybrid with *gramineus*, of which it may be a form, but further gatherings are necessary to establish the above determination.]

2493. P. GRAMINEUS L. (*heterophyllus*). (F.). Burrafirth!; Vallafield, *E. Fl.* Tingwall!, *Tate*. Clickhimmin!; between Usta-

ness and Scalloway; Neugles Water; Grasswater; Sandsting; Walls!, *Beeby*.

Var. *LACUSTRIS Fr. Tingwall, 1920.

2495. × P. NITENS Web. (F.). Brousta; Spiggie!; Tingwall!; Asta Burn; Neugles Water; Scalloway, *Beeby*. Bardister Loch, 1920.

Var. CURVIFOLIUS Hartm. North end of Loch of Cliff; Tingwall, *Beeby*. Probably the *lanceolatus* of Edmondston.

[2498. *P. lucens* L. Loch of Cliff; North Roe, *E. Fl.* Error.]

2501. P. PRAELONGUS Wulf. (F.). Loch of Watlee!; Tingwall!; Burga Water; Kirkiegarth, *Beeby*. Bardister. Tingwall, 1920. Loch of Huesbreek. Asta Loch.

2502. P. PERFOLIATUS L. (F.). Scalloway; Norwick; Loch of Cliff!; near Burravoe; Tingwall!, *Beeby*. Bardister. Watlee.

Var. LANCEOLATUS Blytt. West Loch, Hildasay, 1889, *Beeby*. Tingwall. Loch of Cliff.

[2503. *P. crispus* L. Tingwall; Loch of Cliff, *E. Fl.* Error.]

2508. P. PUSILLUS L. (F.). Clickhimmin Loch, immature; pools on the Cloka Burn, *Beeby*. Bardister Loch. Asta Loch, 1920.

[Var. *rigidus* Bennett. Bardister Loch, plentiful, *Beeby*, *l.c.*, 30, 1891. Said to be the same as the Orkney plant, but it is smaller with shorter leaves. This requires confirmation, as it may be one of the two next species.]

*2508. P. PANORMITANUS Biv. Tingwall, 1920. Asta, 1921.

*2509. P. RUTILUS Wolfg. Tingwall Loch. Bardister Loch, 1920. This removes the query in *British Pondweeds* for its occurrence in the Shetlands.

2512. P. PECTINATUS L. Brackish pools, Dales Voe; Balta Sound, *E. Fl.*, but needs confirmation. Asta; Tingwall; Spiggie, *Beeby*.

[2512 (2). *P. vaginatus* Turc. *P. pectinatus*, var. *fluviatilis*

S. & M. Tingwall and Asta Lochs, teste Bennett, and probably this in Spiggie Loch, *Beeby*, *l.c.*, 235, 1907. These are not the true *vaginatus*, which at present is not known to grow in Britain, but the hybrid described in the next paragraph.]

*2512. × P. SUECICUS R., var. INTERMEDIUS, nova forma PECTINATOIDES Hagström = P. PECTINATUS × FILIFORMIS. Tingwall Loch. Asta Loch, 1920. Loch of Spiggie, 1921. These are identical with Beeby's so-called *vaginatus*, and Dr Hagström has thus definitely identified them.

[*P. lanceolatus* Edmondst. Burrafirth. It is an error.]

2513. P. FILIFORMIS Pers. (*marinus* L.). (F.). Uyea Sound!; Kirk Loch; Ness Loch, Yell, *Tate*, 1866. Balta Sound; Scalloway; Asta!, *Beeby*. Tingwall and Asta Lochs, 1920. Loch of Spiggie. Loch of Huesbreek, abundant. Watlee, 1921.

2515. RUPPIA MARITIMA L. (*spiralis*). Moss Bank; Dales Voe; Busta, *E. Fl.* Dale Burn; Haggrister Bight; Sullum Voe; Fugla Ness, *Beeby*.

2516. R. ROSTELLATA Koch. (F.). Hoove; upper end of Whiteness Voe, 1889; Uyea Sound; Unst!, *Beeby*. Plentiful in the sea loch there.

2519. ZANNICHELLIA POLYCARPA Nolte. Loch of Watlee, Unst, 1888; Bardister, 1891, *Beeby*.

2520. ZOSTERA MARINA L. (F.). Common, *E. Fl.* Balta Sound, *C. C.*

Var. ANGUSTIFOLIA Hornem. The only form seen, Whiteness; Balta, *Beeby*.

2529. ELEOCHARIS PALUSTRIS Br. (F.). Common, *E. L. & Fl.* Burrafirth, *Tate*. Ollaberry, *West*. Punds Loch!, *Beeby*. Spiggie. Dunrossness. Bardister. Eala Water. Bressay. Balta Isle. Lund.

2529 (2). E. UNIGLUMIS Schultes. (F.). Loch of Cliff!; Queyfirth; Burrafirth!; Breiwick; Scalloway; Uyea; Hildasay, *Beeby*.

2530. E. MULTICAULIS Br. (F.). Bogs on hills between Burga Water and Snarraness Voe; Tingon Burn; Clousta, 1891; Punds Loch!, *Beeby*.

[2531. *E. acicularis* Br. Ronas Hill, 1868; Unst, *C. C.* Queyhouse Loch, 1886, *Beeby*, but Beeby's specimen proved to be a submerged form of *Juncus bulbosus*. Needs confirmation.]

2534. SCIRPUS LACUSTRIS L. Loch of Lund!, *E. Fl.* Sandwater Loch, *P. W. White* in *Tudor's Orkney and Shetland*, 1883. Grasswater; Bridge of Walls, *Beeby*. The Lund plant was very small in 1921.

2538. S. CAESPITOSUS L. (F.). Very common, *E. L. & Fl.* Bressay, *Tate*. Colvadale; Ronas Voe; Walls, *Beeby*. Ollaberry, *West*. Mousa. Hoo Field.

Var. *GERMANICUS (Pallas). (F.). It is the common, if not the only, form. Saxavord. Hermaness. Ronas Hill. Mousa.

2539. S. PAUCIFLORUS Lightf. (F.). Rather common in Unst!; Hillswick; Ollaberry; Asta!; Hillswick, common, *Beeby*. Eala Water Burn. Hoo Field. Colvadale. Gallow Hill.

2542. S. SETACEUS L. Between Sundabanks and Wester Quarff; near the sea at Burwick; Scalloway, 1889, *Beeby*.

2544. S. FLUITANS L. Cloka Burn, a mile above Walls; Burga Water!; burn running from Houllma Water to Grasswater!, *Beeby*, 1891.

2546. S. RUFUS Schrad. Scarce. Dales Voe; Bressay; Burrafirth; Yell, *E. Fl.* Whiteness Voe; Clousta; Sullum Voe, *Beeby*. Balta Sound, 1920.

[2547. *Eriophorum paniculatum* Druce = *latifolium* and *E. polystachion*. Very common, *E. Fl.* Unst, *C. C.* These doubtless refer to the next species.]

2548. E. ANGUSTIFOLIUM Roth. (F.). Abundant, *E. L. & Fl.* West Quarff; Colvadale!, *Beeby*. Ollaberry, *West*. Spiggie. Bressay. Mousa.

Var. LONGIFOLIUM Hoppe. Bog by Twart, *Beeby*.

2550. E. VAGINATUM L. (F.). Common, *E. L. & Fl.* Bressay, *Tate*. Mousa Voe, *Beeby*. Ollaberry, *West*. Saxavord. Hermaness. Setter, etc.

[2553. *Rynchospora alba* Vahl. Mousa, Unst, *E. L.* Vaila Island, *E. Fl.* Doubtful, *Beeby*. Needs confirmation. The *R. fusca* of *Saxby's Flora*, 90, is an error for *Scirpus rufus*.]

2554. SCHOENUS NIGRICANS L. Not unfrequent in Unst on serpentine, *E. L. & Fl.* Scarpoe, Unst; Isle of Uyea, *Tate*. Eala Water. Colvadale. Tingwall.

Var. NANUS Lange. Balta Sound!, *Beeby*. Hoo Field. Colvadale.

2561. CAREX VESICARIA L. Abundant near Grasswater; near Bridge of Walls!, *Beeby*, 1907. Houllma Water, 1920.

[*C. saxatilis* L. (F.).]

2564. C. INFLATA Huds. (*ampullacea*). Frequent, *E. L. & Fl.* An androgynous form in the Mailand Burn!; Queyfirth; Ollaberry; Burga Water, *Beeby*. Near Punds Water. Mangaster. Loch of Lund. Queyhouse. Uyea Sound. Loch of Lund, etc.

Var. *BRUNNESCENS (And.). Haroldswick. Loch of Watlee.

[2571. *C. capillaris* L. Ronas Hill, *E. Fl.* Needs confirmation.]

2572. C. BINERVIS Sm. (F.). Frequent!, *E. L.* Hermaness; Uyea; North Maven, *E. Fl.* Ronas Hill, *C. C.* Hermaness!, *Tate*. Skelberry; Clousta; Eala Water; Boer Water Loch; Dall of Lumbister, Yell; Uyea; North Maven; Fair Isle; a small form on Saxavord; a remarkable dwarf form (f. *gracilior*) on Ronas Voe and Saxavord, *Beeby*. Hoo Field. Sundabanks. Colvadale, etc. A very tall, lax form on Ronas Voe, 1920.

Var. NIGRESCENS Druce. Near this at Neugles Water Burn, *Beeby*. See *Scot. Nat.* 38, 1889.

[2573. *C. distans* L. Tate suggests this is Edmondston's *speirostachya*, but that is probably a *fulva* form. Beeby and I were unable to find *distans*.]

2575. C. FULVA Host. (*speirostachya*). (F.). Common, *E. Fl.* Ollaberry; Colvadale!, *Beeby*. Balta Sound. Watlee. Burrafirth. Uyea. Mousa. Hoo Field. Setter. Eala Water, etc.

2576. C. FLAVA L., aggregate. (F.). Common, *E. Fl.* The type in a ditch running into the north end of the Loch, Tingwall, *Beeby*, 1889.

Var. OEDOCARPA Anders. (*minor*). Ronas Hill, 1868, *C. C.* Ollaberry; Weisdale; Boddam; Ronas; Balta!; Fair Isle, *Beeby*. Laxfirth. Hoo Field. Walls. Bressay. Burga Water. Mousa. Watlee. Colvadale. Burrafirth.

× C. XANTHOCARPA Déség. (F.). Colvadale!; Benegarth; North Maven; Gibbies Law, *Beeby*. Mousa. Tingwall. Watlee. This includes hybrids of *C. fulva* with forms of *C. flava* and *lepidocarpa*.

2576 (2). C. LEPIDOCARPA Tausch. Ronas Hill, 1868, *C. C.* Ollaberry; Weisdale, *Beeby*. Mousa. Watlee. Haroldswick. A suggested hybrid of this with *C. flava* was seen at Gibbies Law by Beeby.

2577. C. OEDERI Retz. Frequent, *E. Fl.* Stony loch shore above Burwick, near Scalloway (near var. *pygmaea* And.); Tingwall!; Sae Water; Torve Hill, *Beeby*.

C. FLAVA, var. OEDOCARPA × OEDERI. Sae Water; Torve Hill, 200 ft., *Beeby*.

[2583. *C. caryophyllea* Lat. (*praecox*). Common, *E. Fl.* Error. Not seen by Beeby or myself. Doubtless the next species was mistaken for it.]

2587. C. PILULIFERA L. (F.). Scarpoe, Unst; Isle of Uyea!, *Tate*, 1866. Rather common, Saxavord!; Ronas!; Skelberry, *Beeby*. Balta Sound, 1920. Scalloway. Hoo Field. Mousa. Colvadale. Gallow Hill, etc.

Forma REPTANS Lange. Grass slopes above Burrafirth, *Beeby*.

2588. C. DIVERSICOLOR Crantz = GLAUCA = RECURVA. (F.). Abundant!, *E. L. & Fl.* Burrafirth; Colvadale; Balta; Fair Isle, *Beeby*. Mousa. Bressay, etc. A suggested hybrid—*glauca* × *flava*—occurred on a holm on a small tarn in Gibbies Law Burn, but no oth r sedge grows on the holm, *Beeby*. A very stout-spiked form grew on Balta Sound, and a strongly rhizomatous form on Colvadale.

2591. C. PANICEA L. (F.). Out Skerries, *Peach*. Lerwick!; Bressay!; Unst!, *Tate*. Ronas!, *C. C.* Colvadale; Balta, *Beeby*. Hoo Field. Eala Water. Haroldswick. Watlee.

[*C. cespitosa* L. West side of Loch of Cliff, *Beeby* in *Scot. Nat.* 217, 1888, but it is not the true plant, being one of the many forms of *Goodenowii*.]

[*C. salina* Wahl. (F.).]

2604. C. GOODENOWII Gay (*vulgaris*). (F.). Common, *E. Fl.* Hillswick; Ronas Voe!; Clickhimmin!; Rools Water; Gibbies Law!; Bonzie Hill!; Lumbister; Yell; Loch of Cliff (as *cespitosa*); Queyfirth; Fair Isle, *Beeby*. Bressay. Mousa. Spiggie. Lee of Setter, etc.

Var. RECTA A. & G. Loch of Cliff!, *Beeby*. Haroldswick. Tingwall.

Var. JUNCELLA (Fries). Loch of Cliff!, common, *Beeby*. Watlee. Lund. Walls. Beeby thought the Clickhimmin plant was a cross with *acuta*. It seems only a variety of the type.

[*C. Goodenowii* × *flava*, *C. Goodenowii* × *rigida*, *C. atrata*, and *C. Lyngby i* are reported from the Faroes.]

2606. C. RIGIDA Good. (F.). Ronas Hill; Saxavord!, *E. Fl.* On a holm in Gibbies Law Burn, under 100 feet, a curious lowland form. See *Scot. Nat.* 30, 1891; Foula; Skelberry, *Beeby*.

2608. C. LEPORINA L. (*ovalis* Good.). (F.). Balta Sound!; North Roe!, *E. Fl.* Burra Voe, *West*. Yell; Uyea Sound!; Tingwall!, *Tate*. Scalloway. Bressay. Mousa. Loch of Cliff. Norwick.

2610. C. ECHINATA Murr. (*stellulata*). (F.). Frequent!, *Tate*. Ronas Hill, *C. C.* Ollaberry, *West*. Asta!; Scalloway!; Hermaness!; Fair Isle, *Beeby*. Spiggie. Hoo Field. Mousa. Bressay. Balta Sound, etc.

2621. C. ARENARIA L. Burrafirth!; Tresta, Fetlar, etc., *E. Fl.* Unst!, *C. C.* Sandwick. Spiggie. Sumburgh. Sandness.

2625. C. INCURVA Lightf. (F.). Dunrossness, *Lightf. Fl. Scot.* 1777. East of Spiggie Loch!; Quendal, *Beeby*.

2628. C. PULICARIS L. (F.). Frequent in Unst!, *E. Fl.* Ronas Hill!, *C. C.* Scalloway!; Ollaberry, *Beeby*. Laxfirth. Cliva Hill. Hoo Field. Tingwall. Colvadale. Gallow Hill. Clibberswick. Saxavord. Hermaness. Mousa.

2629. C. DIOICA L. (F.). Uyea; Yell; Fetlar, *E. Fl.* Bressay, *Tate*. Springfield; Unst; Asta, *Beeby*. Tingwall. Hoo Field. Colvadale.

†2651. PHALARIS CANARIENSE L. Alien. Scalloway; Loch End, *Beeby*. Lerwick, 1921.

2655. P. ARUNDINACEA L. (F.). Abundant, *E. L. & Fl.* Ness, North Yell, *Tate*. Unst; Mainland, *C. C.* Ollaberry, *West*. Tingwall; Fair Isle, *Beeby*. Spiggie. Scalloway. Brousta. Eala Water. Dunrossness. Bressay. Haroldswick. A conspicuous feature in marshy fields north-west of Norwick. The green as well as the purplish panicled plants occur.

Var. *†PICTA L. Burn side, Loch of Cliff. Waste ground, Balta Sound.

2657. ANTHOXANTHUM ODORATUM L. (F.). Common, flowering through the summer, *E. Fl.* Scarpoe, Unst, *Tate*, 1865. Ollaberry, *West*. Lerwick; Scalloway; Saxavord!, *Beeby*. Bressay. Mousa. Balta Isle.

2662. ALOPECURUS PRATENSIS L. (F.). Not very common. Ollaberry, *E. Fl.* Balta Sound. Tingwall, 1920. Lerwick. Bressay.

2666. A. GENICULATUS L. (F.). Common, *E. L. & Fl.* Unst; Lerwick!, *C. C.* Scalloway. Setter. Bressay. Dunrossness. Uyea Sound. Haroldswick.

2673. PHLEUM PRATENSE L. (F.). Abundant, *E.L.* Probably introduced, *E. Fl.* Buness, Unst, *Tate.* Scalloway; Bressay, *Beeby.* Tingwall. Lerwick. Balta Sound, as a robust dark-stamened plant, with a bulbous root, the Black Timothy, which comes under var. **intermedium* Schultz.

2684. AGROSTIS ALBA L. (F.). Common, *E. L. & Fl.* Unst; Ollaberry, *West.* Foula, *Beeby.* Tingwall. Lerwick. Bressay.

Var. STOLONIFERA (L.). (F.). Unst; Ollaberry, *West.* Clickhimmin, *Beeby.* Balta Sound.

Var. COARCTATA Hoffm. Ollaberry; Clickhimmin!, *Beeby.* Lerwick, 1920. Spiggie. Sumburgh. Bressay.

Var. MARITIMA Meyer. (F.). Balta Sound; Ollaberry, *Beeby.*

2685. A. CAPILLARIS L. = TENUIS Sibth. = VULGARIS With. (F.). Everywhere common, *E. L. & Fl.* Uyea, *Tate.* Unst; Ronas Hill, *C. C.* Ollaberry, *West.* Colvadale!, *Beeby.* Scalloway. Hoo Field. Bressay. Mousa. Setter. Saxavord.

[A hybrid with *canina* and a var. *montana* Hartm. are recorded for the Faroes.]

Var. PUMILA (L.) Druce. Not unfrequent, *E. Fl.* Rather common, *Beeby.* Unst; Ollaberry, *West.* Clickhimmin, *Beeby.* Balta, 1920. Lee of Setter. Colvadale. Saxavord. Hermaness. Hoo Field. Burga Water.

2687. A. CANINA L. (F.). Dry heaths, *E. Fl.* Scarce, Balta Sound; Skelberry; Aithness, *Beeby.* Hoo Field. Hermaness.

Var. *MONTANA Hartm. Balta.

Var. MUTICA Gaud. Sneug, Foula, *Beeby.* Hoo Field.

[2694. *Arundo Calamagrostis.* Very rare, loch near Fedaland, North Maven, *E. L.* Needs confirming.]

2702. AMMOPHILA ARUNDINACEA Link. (F.). Common, *E. Fl.* Burrafirth, *C. C.* Spiggie; Clayval, *Beeby.* Sandwick. Sumburgh.

[*Apera Spica-venti* Beauv. Alien. (F.).]

2706. AIRA CARYOPHYLLEA L. Not unfrequent (*sic*), *E. Fl.* Only one specimen seen in a cornfield between Scalloway and Tingwall, *Beeby*. In 1921 I came across it in a native station on slaty rocks near Scalloway, where it was plentiful.

2707. A. PRAECOX L. (F.). Common, *E. L. & Fl.* Unst, *C. C.* Ubiquitous as at Hillswick; Balta; Saxavord, *Beeby*. Bressay, *Tate*. Mousa. Balta Isle. Hermaness. Ronas. Sumburgh. Sundabanks.

2709. DESCHAMPSIA CAESPITOSA Beauv. Common, *E. Fl.* Burravoe, Yell, *Tate*. Ollaberry; Fair Isle, *Beeby*. Saxavord. Hermaness. Ronas Hill. Sumburgh. Dunrossness. North Maven, etc.

Var. ARGENTEA Gray (*pallida*). Hamna Voe; Gluss Burn; Ollaberry, *Beeby*. Bressay. Mousa. Haroldswick.

Var. *BREVIFOLIA (Parn.). Clibberswick.

[*D. alpina* R. & S. (F.).]

2711. D. SETACEA Hack. East side of Tingwall Loch, 1888 [there in 1920]; by a small loch, north-east side of Ronas Hill, abundant, 1892, *Beeby*.

2712. D. FLEXUOSA Trin. (F.). Abundant!, *E. L. & Fl.* Unst; Ollaberry, *West*. Lerwick, *Tate*. Weisdale; Ronas!; Walls!; Balta!; Foula, *Beeby*. Scalloway. Hoo Field. Burrafirth. Gallow Hill.

Var. MONTANA (Huds.). Top of Saxavord Hill!; Scallageil; Weisdale, at 135 metres, as forma *rigida*, *Beeby*. This last is a fine plant deserving further study. Hoo Field.

2713. HOLCUS MOLLIS L. (F.). Reawick, *E. Fl.* Laxfirth Voe. *Beeby*.

2714. H. LANATUS L. (F.). Common!, *E. L. & Fl.* Buness! *Tate*. Unst; Burrafirth!, *Beeby*. Ollaberry, *West*. Bressay. Mousa. Common.

Var. *ALBOVIRENS Reichb. Tingwall. Scalloway.

[*Briza media* L. Alien. (F.).]

[2717. *Avena fatua* L. North Maven; Burrafirth, *E. Fl.* Not since observed. I suspect this is *A. pubescens.*]

2719. A. STRIGOSA Schreb. (F.). Alien. Not uncommon, *E. Fl.* Balta Sound. Tingwall. Lee of Setter. Bressay. This is the oat in common cultivation.

Sub-species *PUBESCENS Marq. Haroldswick, etc.

†2720. A. SATIVA L. (F.). Alien. Balta, *Tate*, 1866. Scalloway.

2722. A. PUBESCENS Huds. Burrafirth, as *Arrhenatherum*, 1866; Sundabanks ravine, *Tate*. Estwick Burn, Ollaberry; Cliva Hill; Kergord Burn, Weisdale; Sand Voe, *Beeby*. Petister. Loch of Cliff, 1920.

2724. ARRHENATHERUM ELATIUS M. & K. Not frequent, *E. Fl.* Rare, Mid Yell Voe; Scalloway, *Beeby*. Tate's plant is *Avena pubescens*. Bressay. Sumburgh.

2725. A. TUBEROSUM (Gil.) Druce. Common, *E. Fl.* Balta Sound. A troublesome pest in oat-fields. Many loads of the onion-like roots were collected from a single field.

2732. SIEGLINGIA DECUMBENS Bernh. (F.). Frequent!, *E. Fl.* Burravoe, Yell, *Tate*. Unst; Mainland, *C. C.* Ollaberry, *West*. Voesgarth!; Balta, *Beeby*. Dunrossness. Scalloway. Bressay.

2733. PHRAGMITES VULGARIS (Lam.) Druce. (F.). Loch near Ronas Hill, *E. L. & Fl.* Sand Lodge, *C. C.* Mailand; Sandsting, *Beeby*. Dunrossness.

†2737. CYNOSURUS ECHINATUS L. Alien. Bressay, 1840-1843, *E. L.* An accidental introduction.

2738. C. CRISTATUS L. Chiefly on limestone, *E. L. & Fl.* Ting-

wall!, *Beeby*. Unst; Ollaberry, *West*. Lerwick. Bressay. Norwick.

2745. MOLINIA CAERULEA Mönch. (F.). Frequent!, *E. L. & Fl.* Unst; Mainland, *C. C.* Scalloway; Ollaberry, *West*. Burwick; Fair Isle, *Beeby*. Bressay. Mousa. Balta Isle. Ronas Hill. Saxavord. Hermaness, &c.

Var. DEPAUPERATA (Lindley). Ronas Hill!; Vallafield!; Unst, *E. Fl.* Balta.

Var. BULBOSA Edm. Burrafirth, *E. Fl.*

Var. MINIMA Rabenh. Unst; Fair Isle, *Beeby*. To this Beeby refers the var. *bulbosa*. Hoo Field. Clibberswick. Colvadale.

2746. CATABROSA AQUATICA Beauv. (F.). Scarce, Tingwall; Lund; Whalsey, *E. Fl.* Quendal Bay; Hillswick, *Beeby*.

Var. UNIFLORA S. F. Gray. Ness Loch, N. Yell, as var. *minor*, *Tate*, 1865, in *Hb. Druce*.

2750. MELICA UNIFLORA Retz. Burn of Sundabanks, Scalloway, *E. Fl.* I could not find it, and it should be confirmed.

2751. DACTYLIS GLOMERATA L. (F.). Common, *E. L. & Fl.* Scalloway, *Beeby*. Unst, *West*. Bressay. Lerwick. Walls. Norwick, etc. Perhaps introduced.

2759. POA PRATENSIS L. (F.). Common!, *E. L. & Fl.* Lerwick, *Tate*. Uyea, *Beeby*. Bressay. Mousa. Balta Isle. Common and variable. A robust form with dark-coloured spikelets on the Cliffs of Burrafirth.

Var. SUBCOERULEA (Sm.). The usual Shetland form. Burrafirth, *Tate*. Hillswick; Queyfirth; Saxavord; Balta, *Beeby*. Lerwick. Setter. Scalloway. Bressay. Sumburgh. Spiggie. Sandwick.

*2759 (2). P. IRRIGATA Lindm. Burrafirth, and as a dwarf rock and sea shore form with scarcely protruding panicle; from Sandwick as a form "illa squamis perlatis, quae litora Scandinaviae dispersa est," teste C. Lindman.

2761. P. TRIVIALIS L. (F.). Common, *E. L. & Fl.* Buness, Unst, *Tate.* Lerwick!; Scalloway; Asta Voe!; North Roe; Benegast; Queyfirth; Burrafirth, *Beeby.* Ollaberry, *West.* Bressay. Mousa. Setter.

Var. *SEPTENTRIONALIS mihi. Tingwall. Lerwick. Balta. Burrafirth, etc. Characterised by its larger florets of a purplish-black colour. The stem puts out off-sets above the surface, so that it is a useful forage form which might be worth cultivation.

[2765. *P. compressa* L. Common, *E. Fl.* An error for a *pratensis* form.]

2769. P. ANNUA L. (F.) Everywhere common, *E. L. & Fl.* Scalloway; Hildasay, *Beeby.* Ollaberry, *West.* Unst, *C. C.* Bressay. Mousa. Balta Isle.

Var. PERENNIS Druce in Rep. B.E.C. 584, 1919. Spiggie Voe.

[*P. glauca*, *P. nemoralis*, and *P. alpina* are recorded from the Faroes.]

2772. GLYCERIA FLUITANS Br. (F.). Frequent!, *E. L. & Fl.* Lund, Unst, *Tate.* Hillswick Voe; Breiwick; Twart; Walls; Queyfirth, *Beeby.* Ollaberry, *West.* Scalloway. Cunningsburgh. Sumburgh. Bressay. Mousa. Uyea Sound. Norwick. Haroldswick. Mailand Burn.

Var. *TRITICEA Fr. Norwick. Ronas Voe, etc.

2774. G. DISTANS Wahl. (F.). South side of Balta Voe!, *Tate*, 1866. Bressay. Balta Sound.

Var. PROSTATA Beeby. Stony shore of Hildasay Isle, abundant about the landing place, *Scot Nat.* 38, 1889. Proves constant in culture, *Beeby.* Balta Sound, 1920. Bressay, 1921. Uyea Sound. A curious slender plant with a prostrate habit.

2776. G. MARITIMA Wahl. (F.). Not unfrequent, *E. Fl.* Balta Voe!, *Tate.* Queyfirth, *Beeby.* Ordale. Lerwick. Virkie.

2782. FESTUCA ELATIOR L. (F.). Loch of Cliff; Fetlar; Tingwall, *E. Fl.* Not seen at Tingwall; Lerwick, *Beeby.* Scalloway.

2785. F. RUBRA L. = DURIUSCULA (*sic*), E. Fl. (F.), Queyfirth; Burga Water, common, *Beeby*. Bressay. Mousa. Balta Isle. Uyea Sound. Setter. Ronas Voe. Lerwick. Walls. Sandwick. Cunningsburgh. Sumburgh. Spiggie.

Var. PRUINOSA Hack. (*glaucescens*). Burrafirth, *Beeby*, who thinks it is Edmondston's *elatior*. Norwick. Balta.

Var. LITTORALIS (Hack. as sub-var.). Burrafirth; Ollaberry, *Beeby*.

Forma GRANDIFLORA Hack. Ronas Hill, *Beeby*.

Var. *BARBATA (Hack.). Spiggie.

2787. F. OVINA L. (F.). Common, *E. L. & Fl.* Unst; Ollaberry, *West*. Bressay. Mousa, etc.

Var. VIVIPARA E. L. & Fl. (F.). Unst; Mainland, *C. C.* Ollaberry, *West*. Uyea; Eala Water; Ronas Voe!; Loch of Cliff!, *Beeby*. Scalloway. Hoo Field. Setter. Hermaness. Tingwall. Saxavord, etc.

Sub-var. LAEVIFOLIA Hack. Loch of Cliff, *Beeby*.

†2807. BROMUS COMMUTATUS Schrad. Alien. Occasionally, *E. Fl.* Quendal; Levenek, *Beeby*.

[2809. *B. arvensis* L. Rare, *E. L.* Error.]

2811. B. HORDEACEUS L. (*mollis*). (F.). Common, *E. L. & Fl.* Only seen at Hamna Voe and Sand Voe, *Beeby*. Scarce and doubtless introduced. Burrafirth, very luxuriant specimens.

Var. †*LEPTOSTACHYS (Pers.). Balta. Asta.

†2821. LOLIUM TEMULENTUM L. Alien, *E. Fl.* Tate suggests this is *italicum*.

2824. L. PERENNE L. (F.). Very frequent, *E. L. & Fl.* Lund, *Tate*. Lerwick, *C. C.* Ollaberry, *Beeby*. Common, Bressay. Mousa.

[*L. multiflorum* Lam. (F.).]

2827. AGROPYRON JUNCEUM Beauv. (F.). Most of the sea

beaches and sands, Dunrossness!; Lund!; Sandwick; Unst, *E. Fl.* Norwick!, *Tate*. Mid Yell Voe; Burrafirth, *Beeby*.

× A. HACKELII Druce = JUNCEUM × REPENS = ? var. MARITIMA Edm. (F.). Lunna; near Sound; Lerwick; Hamna Voe; Burravoe, Yell, etc., *E. Fl.* Burrafirth; Mid Yell Voe; Norwick; Sand Voe, *Beeby*. To this must come a curious plant from Ronas Voe of which only a solitary specimen was seen in 1920.

2830. A. REPENS Beauv. (F.). Everywhere, *E. L. & Fl.* Lund, as *litoreum*, *Tate*. Norwick; Scalloway; Mid Yell; Fair Isle, *Beeby*. Lerwick. Bressay. Mousa.

Var. LEERSIANUM S. F. Gray. Buness, *Tate*. Mid Yell Voe, *Beeby*. Fair Isle, as *barbata*, *Beeby*. Lerwick. Norwick.

2847. NARDUS STRICTA L. (F.). Very common; scarce on limestone or serpentine, *E. Fl.* Bressay, *Tate*. Ronas Hill, *C. C.* Ollaberry; Unst, *West*. Scalloway. Bressay. Mousa. Hermaness. Saxavord.

2855. ELYMUS ARENARIUS L. (F.). Common, *E. L.* Dunrossness!, *E. Fl.* Burrafirth, *Tate*. Mid Yell Voe!; Asta Voe, *Beeby*. Spiggie. Scalloway. Sumburgh. Norwick. At Burrafirth it grew on a detached rock, 30 ft. high, to which seeds had been blown by the wind. The glumes are more acute than in most specimens.

2860. JUNIPERUS NANA Willd. (F.). Voesgarth, Unst, *E. Fl.* Cunningsburgh; Dunrossness, *Saxby Fl.* Dall of Lumbister, Yell; Björgs of Skelberry, *Beeby*. Ronas Hill, one plant, *West*. Fair Isle, *Beeby*.

[*J. communis* L. Cunningsburgh, *E. Fl.* xi. Voesgarth, Unst, *Saxby Fl.* Needs confirming.]

2867. EQUISETUM ARVENSE L. (F.). Frequent, *E. L. & Fl.* Burrafirth, *Tate*. Lumbister, Yell; Easter Quarffs; Twart; Sandwick, *Beeby*. Whiteness. Laxfirth. Petester. Uyea. Near Dales Voe. Bressay.

Var. ALPESTRE Wahl. Ollaberry, *Beeby*.

2868. E. SYLVATICUM L. (F.). Petester!, Woodwick, Unst;

Upper Sound, Lerwick, etc., *E. Fl.* Skaa!; Burrafirth; Queyfirth; North Maven, *Tate.* Sundabanks, *C. C.* Ollaberry, *West.* Ronas Voe. East of Feal.

2870. E. LIMOSUM L. (F.). Not rare, Loch of Cliff!, *E. Fl.* Lerwick, *C. C.* Common, Ollaberry, etc., *Beeby.* Spiggie. Lunga. Tingwall. Bressay. Dunrossness. Loch of Lund. Houllma Water.

2871. E. PALUSTRE L. (F.). Common, *E. L. & Fl.* Bressay, *Tate.* Ollaberry; Sandwater Loch; Weisdale; Loch of Cliff!; Fair Isle, *Beeby.* Hoo Field. Dunrossness. Loch of Lund. Uyea. Norwick, etc.

[*E. pratense* Ehrh. (F.).]

2876. PTERIS AQUILINA L. (F.?). Common, *E. Fl.* Unst; Mainland, *C. C.* A dwarf state at Burrafirth, *Tate.* Clousta, *Beeby.* Ronas Voe, near whaling station!, *West.*

2878. BLECHNUM SPICANT With. (F.). Abundant, *E. Fl.* Bressay, *Tate.* Unst; Mainland, *C. C.* Setter Mill; Clousta; Sundabanks; Asta, *Beeby.* Ollaberry, *West.* Near Spiggie. Burga Water. Cliva Hill. Hoo Field. Mousa.

2879. PHYLLITIS SCOLOPENDRIUM Newm. Sundabanks; Scalloway; Cunningsburgh, *E. Fl.* I could not find it.

2880. ASPLENIUM MARINUM L. Burrafirth sea caves!, *Peach*, 1864. North side of Vermentry; Fair Isle, *Beeby.*

2881. A. TRICHOMANES L. (F.). Rocks about Hamari Water; south side of the North Voe of Clousta, *Beeby*, 1907.

2882. A. VIRIDE Huds. Muckle Heog, 400 ft., *Tate*, 1865. East side of Hjoags, Unst, *Beeby.*

2885. A. ADIANTUM-NIGRUM L. (F.). Harold's Grave, Muckle Heog!; Balta Sound!, *C. C.* Hoo Field!; Cunningsburgh; Hjoags!; Unst; Fetlar, *Beeby.* Burga Water, a lax form. Cliva

Hill. Skaa. Clibberswick, on the hill and cliffs. Colvadale. Saxavord.

2886. A. RUTA-MURARIA L. On rocks about the North Loch of Hostigates, *Beeby*, 1907.

2889. ATHYRIUM FILIX-FOEMINA Roth. (F.). Abundant, Burrafirth!, etc., *E. Fl.* Ronas Hill, *C. C.* Sundabanks, *Beeby*. Cunningsburgh. Eala Water. Clibberswick. Petester. Hermaness, etc.

Var. *CONVEXUM Newm. Burrafirth. Watlee.

[*Polystichum Lonchitis* Roth. (F.).]

2896. DRYOPTERIS FILIX-MAS Schott. (F.). Abundant, Burrafirth!; Lerwick!, *E. Fl.* Not common between Queyfirth and Ollaberry; Mavisgrind!, *Beeby*. Burga Water. Ronas Voe. Hermaness. Skaa.

2899. D. ARISTATA Druce (*Lastrea dilatata*). (F.). Lerwick!; Bressay!; Saxavord!; Burrafirth!; Ollaberry, *Tate*, 1866. Yell, *C. C.* Haroldswick!; Mavisgrind!; Collafirth!; Clousta Voe; Vementry; Ward of Hostigates; Grud Burn; Gelligoe; Sandwick, *Beeby*. Sundabanks. Burga Water. Eala Water. Setter. Skaa. Hermaness. Saxavord.

Var. ALPINA Moore. Setter Mill; Clousta Voe, *Beeby*. Saxavord. Hermaness.

2902. D. OREOPTERIS (Presl) (*montana*). North Roe, *E. Fl.* Mouth of the Grud Burn; Ronas Voe!; floor of Picts House, Björgs of Housetter, *Beeby*.

[2903. *D. Thelypteris* A. Gray. Scalloway; Quendal, *E. Fl.* An error, *Tate*.]

2906. CYSTOPTERIS FRAGILIS Bernh. (F.). Petta Water Burn, between Petta Water and Sandwater, *Beeby*, 1909.

2907. POLYPODIUM VULGARE L. (F.). Frequent!, *E. L. & Fl.* Loch of Cliff!; Hostigates; Clousta; Hamari Water; Skelberry;

Mavisgrind!; Housetter; Asta!, *Beeby*. Sundabanks. Hoo Field. Clibberswick.

Var. BREVE Lange. Saxavord!, *Beeby*. Hoo Field. Clibberswick.

2908. PHEGOPTERIS POLYPODIOIDES Fée. (F.). Near Busta, *E. Fl.* Björgs of Skelberry, 550 ft.; Uyea; Pettadale, *Beeby*.

2909. P. DRYOPTERIS Fée. (F.). Ravine of Clayva Burn, 1890; Neeans, 300 ft., Septia Fields; Ronas Voe, *Beeby*, 1896.

2917. HYMENOPHYLLUM PELTATUM Desv. (*Wilsoni*). (F.). Near Skaa!, *E. Fl.* Burrafirth, *Peach*, 1864. Top of Saxavord and hill at west side of Burrafirth, *C. C.* Björgs of Uyea and Skelberry, *Beeby*. Still very abundant on the south side of the Skaa ravine.

2918. OSMUNDA REGALIS L. Very rare, one tuft near Sandwick, Unst, *E. Fl.* South Loch of Hostigates; Flatpunds Loch; Galta Water; Burga Water, *Beeby*. Still in good condition on the holm in Lunga Water.

2919. BOTRYCHIUM LUNARIA Sw. (F.). Common, *E. L. & Fl.* Balta Sound; Uyea Sound!; Ollaberry; Tingwall!; Fladabister!, etc., *E. Fl.* Haroldswick, *Tate*. Between Boddam and Exnaboe; Ronas Voe!; Cruciefield!; Unst; Fetlar, *Beeby*. Abundant about Balta Sound, even on the turfy lawn of the hotel. Norwick. Clibberswick. Muckle Heog. Colvadale. Whiteness Voe. Brousta Water. Cliva Hill.

2920. OPHIOGLOSSUM VULGATUM L. Burn of Sundabanks, *E. L.* Cunningsburgh, *E. Fl.* I could not find it. The plant may have been the following.

Var. POLYPHYLLUM Braun. Fine turfy ground, Breiwick, *Beeby*, 1896.

2924. ISOETES LACUSTRIS L. (F.). Loch of Cliff; Watlee!; Tingwall!, 1888; Bardister!; Kirkiegarth!, *Beeby*.

Var. FALCATA Lange. Tingwall!; Watlee!, *Beeby*, 1889.

2925. I. ECHINOSPORA Dur. (F.). Culeryn; Clousta; Burga

Water!; Kirkiegarth; Bardister!; Gibbies Law Burn; Hamari Water, *Beeby*.

2927. LYCOPODIUM ALPINUM L. (F.). Abundant on Ronas Hill, *E. Fl.* At 800 ft.!, *Tate*. Björgs of Uyea; Skelberry; Sandy Loch, *Beeby*.

[*L. annotinum* L. (F.).]

2929. L. CLAVATUM L. Ollaberry, *Tate*, 1866. Vallafield, rare, *C. C.* Buness, Unst, *Shoolbred*. Hoo Field, very rare, 1921.

2931. L. SELAGO L. (F.). Common, *E. L. & Fl.* Ronas Hill; Ollaberry, *Tate*. Between Queyfirth and Ollaberry; Burwick; Scalloway; Foula, *Beeby*. Unst; Mainland; Yell, *C. C.* Ronas Hill!, *West*. Hoo Field. Balta. Watlee. Clibberswick.

Var. *APPRESSUM Desv. Hoo Field. Colvadale.

2932. SELAGINELLA SELAGINOIDES Link. (F.). Common, *E. Fl.* Bressay, *Tate*. Unst; Mainland, *C. C.* Abundant on the serpentine at Unst, *West*. Voesgarth!; Septia Fields, *Beeby*. Common even in the hotel lawn, Balta Sound. Saxavord. Hermaness. Ronas Hill.

2934. NITELLA OPACA Ag. North end of Loch of Cliff!; Clickhimmin Loch!, 1886; Lumbister, *Beeby*. Bardister Loch. Burrafirth. Spiggie. Punds Water. Tingwall. Asta. Bardister.

*2936. N. TRANSLUCENS Ag. Bardister Loch, 1920.

*2943 (2). TOLYPELLA NIDIFICA Leonh. (*Nitella nidifica* Ag.). In 1920, in company with Prebendary Burdon, Col. Johnston, and T. Churchill, I collected this rare species in the Loch of Stenness, Orkney, this being the first time it was recorded for Britain. The previous gathering in the British Isles was in a too far advanced condition for figuring, and it was never re-gathered. In Stenness, in brackish water, the plant was luxuriant and in excellent condition. This year in the Loch of Huesbreek, Dunrossness, I found it as a small state, which Mr James Groves, however, named *nidifica*. It is an extraordinary instance of plant distribution as it has not

been found in any of the pieces of water from the Northern Isles to the south-east of Ireland. On the continent it occurs in Sweden, Norway, Finland, and Russia, extending into North Germany and France, and as form *antarctica* as far south as Kerguelen Land.

2949. CHARA VULGARIS L. Ditch running into Tingwall Loch, *Beeby*, 1889.

*2950. C. CONTRARIA Braun. Huesbreek Loch, 1921.

2951. C. HISPIDA L. Loch at Uyea Sound, apparently the var. *brachycarpa*, teste Babington, *Tate*, 1866. I was unable to see it in 1921.

2955. C. ASPERA Willd. Tingwall Loch, *Tate*, 1866. North end of Loch of Cliff, *Beeby*. Watlee. Spiggie. Uyea Sound.

*2955 (2). C. DESMACANTHA Groves and Bullock-Webster. Bardister Loch. Loch of Cliff. Watlee.

2958. C. FRAGILIS Desv. Eala Water, *Beeby*.

2958 (2). C. DELICATULA Braun. Lower end of Tingwall Loch *Beeby*, 1889. Bardister. Kirkiegarth. Asta. Spiggie. Watlee, etc. On the stony margin of Tingwall and Asta Lochs it occurred as a robust tufted form.