THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

REPORT FOR 1937

(WITH BALANCE-SHEET AT 31st DECEMBER 1937).

BY THE

HONORARY EDITOR.

PATRICK M. HALL,

12 HIGH STREET, FAREHAM, HANTS.

VOL. XI. PART V.

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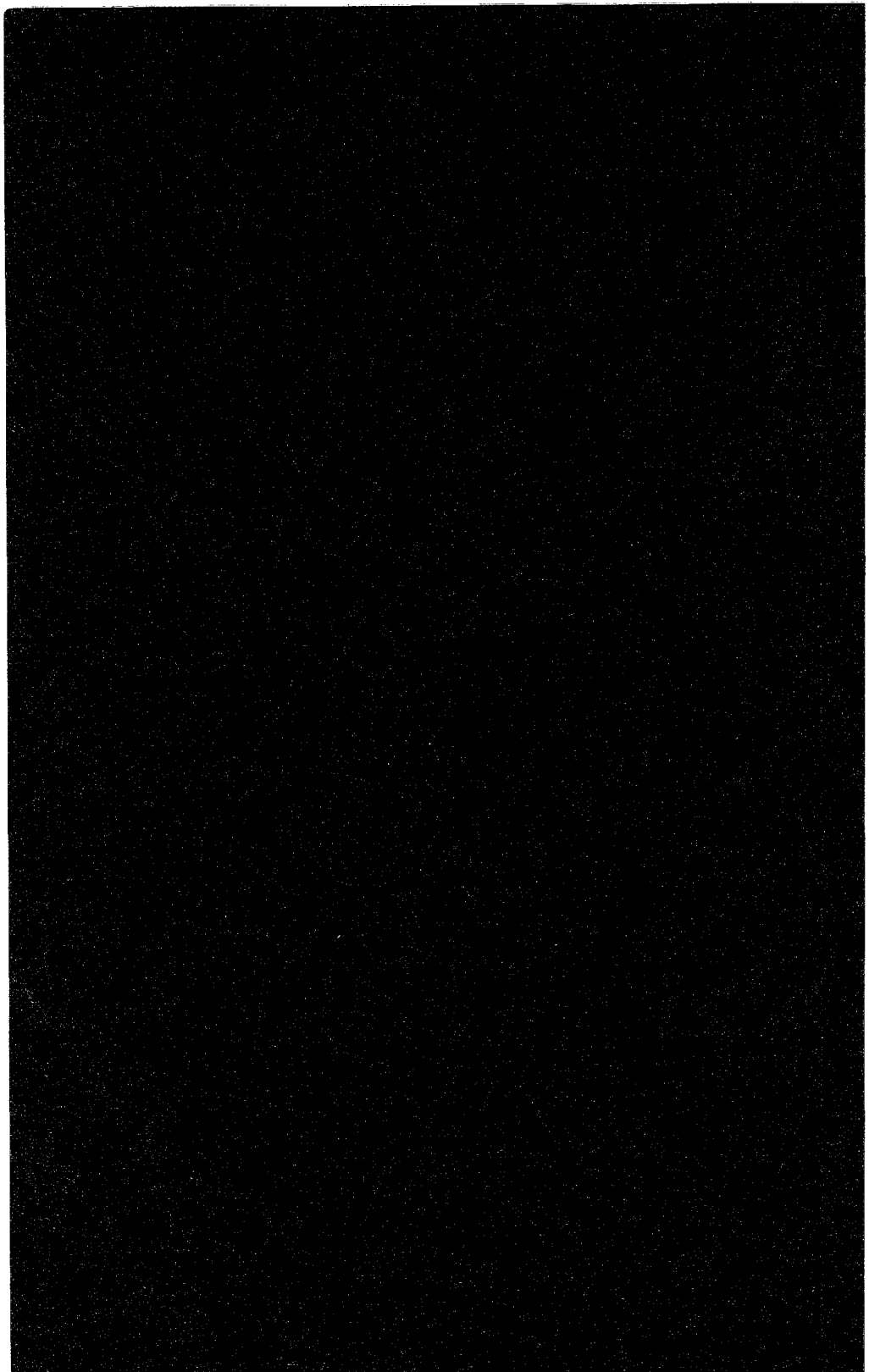

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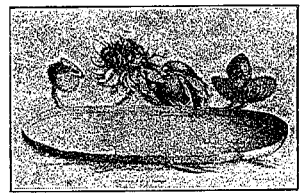
Victoria Regina.



Floreat flora.

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HONORARY EDITOR,

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The Ordinary Member's Subscription of 10/- per annum (or Exchange Member's 20/-) became due on 1st January 1938, and should be paid to the Honorary Secretary, JOHN F. G. CHAPPLE, Yardley Lodge, Crick Road, Oxford.

Exchange Club Parcels for 1938 should be sent, post paid, on or before 1st December 1938, to the HONORARY SECRETARY, who will act as Distributor and Editor of the Distributor's Report (Vol. XII. Part 11).

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

PRINTED BY T. BUNCLE & CO. LTD., ARBROATH.

SEPTEMBER 1938.

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THE BOTANICAL SOCIETY & EXCHANGE CLUB OF THE BRITISH ISLES.

OFFICERS FOR 1938-39.

ELECTED AT THE ANNUAL GENERAL MEETING, MARCH 16TH, 1938.

Chairman—The Rt. Hon. H. T. Baker, P.C.
Vice-Chairman—Mr J. Ramsbottom, O.B.E., M.A., F.L.S.
Hon. Secretary—Mr John F. G. Chapple.
Hon. Treasurer—Mr Francis Druce, M.A., F.L.S.
Hon. Editor—Mr Patrick M. Hall, M.C., F.L.S.

COMMITTEE.

To retire March, 1939.

Dr R. W. Butcher, B.Sc., Ph.D., F.L.S.
Mr J. S. L. Gilmour, M.A., F.L.S.
Mr E. Milne-Redhead, B.A.
Miss E. Vachell, F.L.S.

To retire March, 1940.

Mr J. E. Lousley.
Mr N. Y. Sandwith, M.A., F.L.S.
Mr N. D. Simpson, M.A., F.L.S.
Mr A. L. Still, B.A.

To retire March, 1941.

Mr A. H. G. Alston, M.A., F.L.S.
Mr C. E. Britton, A.L.S.
Mr H. W. Pugsley, B.A., F.L.S.
Lt.-Col. A. H. Wolley-Dod.

To retire March, 1942.

Mr R. H. Corstorphine, B.Sc., F.L.S.
Lady Davy.
Mrs Foggitt.
Dr W. A. Sledge, Ph.D.

Co-opted Member—Mr A. J. Wilmott, M.A., F.L.S.

SUB-COMMITTEES.

Editorial Sub-Committee.

Mr R. H. Corstorphine.
Mr N. Y. Sandwith.
Mr A. J. Wilmott.
The Hon. Editor.

Excursions and Field-work Sub-Committee.

Dr R. W. Butcher.
Miss E. Vachell.
The Hon. Secretary.

Rules Sub-Committee.

The Editorial Sub-Committee with the addition of Mr Francis Druce.

Delegate to British Association—Dr W. B. Turrill, D.Sc., F.L.S.

NEW MEMBERS

(UP TO MAY 1, 1938).

Clark, Dr W. A., Dept. of Botany, King's College, Newcastle-upon-Tyne.
Daly, Mrs Bowes, Dunsandle, Athenry, Co. Galway. (1938.)
Gough, Mrs H., Raford, Athenry, Co. Galway. (1938.)
Gough, J. W., M.A., 10 Staverton Road, Oxford. (1938.)
Leadbitter, E. C. E., C.V.O., 160 Addiscombe Road, Croydon, Surrey.
Leather, Miss V. M., Wyards, Studland, Dorset. (1938.)
Mackechnie, R., B.Sc., 9 Skirving Street, Shawlands, Glasgow, S.1.
*Nelson, G. A., Ph.C., F.L.S., 37 The Crescent, Adel, Leeds, 6. (1938.)
Pinkett, Miss Mary M., " Sunnymead," Braunton, N. Devon.
*Rose, Mrs Eric, Leweston Manor, Sherborne, Dorset.
†Stephenson, Rev. T., D.D., 15 Priory Avenue, Kingskerswell, Devon.
Taylor, S. A., 34 Nelson Street, Leicester. (1938.)
Turnbull, Miss Evelyn, The Mill House, Hildenborough, Kent.
Valentine, D. H., M.A., Ph.D., Botany School, Cambridge.
Wells, Mrs E. M., 91 Colum Road, Cardiff.
Wilde, Mrs C. L., Lindfield, Marshall Road, Godalming, Surrey. (1938.)
Wilkinson, J. S., 26 Golders Rise, Hendon, London, N.W.4. (1938.)
Wilkinson, John, B.Sc., c/o Hartley Botanical Laboratories, The University, Liverpool, 3. (1938.)
Wilkinson, Miss W., Hewell Grange, Redditch, Worcs.
Williams, M. L., The Elms Cottage, Colwall, Malvern. (1938.)
Woodhead, J. E., B.Sc., F.I.C., Ph.C., 3/22 Kensington Palace Court, Sancroft Road, London, S.E.11. (1938.)

CORRECTIONS IN THE LIST OF MEMBERS AND CHANGES OF ADRRESS AND TITLE.

Baring, Hon. Mrs G., Empshott Grange, Liss, Hants.
Butcher, R. W., B.Sc., Ph.D., F.L.S., Culford House, Ewe Lamb Lane, Bramcote, Notts.
Creed, Dr R. S., New College, Oxford.
Curtis, Sir Roger, Bart., The Midland Hotel, Derby.
Dony, J. G., B.Sc., 41 Somerset Avenue, Luton, Beds.
Godalming Natural History, etc., Society. Delete *.
Johnston, Colonel H. H., C.B., C.B.E., D.Sc., etc., c/o Messrs Glyn, Mills & Co., Holt's Branch, Kirkland House, Whitehall, S.W.1.
Lawn, J. G., C.B.E., Hon. D.Sc., Long Acre, Shamley Green, Guildford.
Marks, C. E., Islington Cemetery, East Finchley, London, N.12.
Norton, F., " Westward Ho," 3 Pencisely Rise, Cardiff.
Phillips, Hugh, 803 Raleigh House, Dolphin Square, Grosvenor Road, S.W.1.
Sprott, W. A. P., The Friary, Appleby, Westmorland.
Willan, Mrs Hugh, Underhill House, Shorncliffe, Kent.

ACCOUNTS FOR THE YEAR 1937.

GENERAL FUND.

To Balance from 1936,	£149	7	0	By Insurance,	£0	6	0
,, Subscriptions for 1937 (£181 16s 3d); paid in advance (£30),	211	16	3	,, Advertisement,	1	0	0
,, Excursion Fees,	1	2	6	,, Cheque Book,	0	4	2
,, Donations — Miss D. Cadbury (£18); Miss M. Campbell (19s 6d)	18	19	6	,, Printing (other than Reports), Stationery, & Binding,	15	18	6
,, Sales of Reports and Reprints,	5	19	11	,, Printing Report,	148	6	6
				,, Expenses of Distributor,	1	0	0
				,, Honorarium to Secretary,	25	0	0
				,, Postage & Petty Expenses — Secy. (£11 2s 6d), Editor (£3 15s 6d),	14	18	0
				,, Balance,	180	12	0
	£387	5	2		£387	5	2

PUBLICATIONS FUND.

To Balance from 1936,	£121	0	4	By Balance,	£126	3	10
,, Sales of Comital Flora and Plant List,	5	3	6				
	£126	3	10		£126	3	10

LIFE MEMBERS' FUND.

To Balance from 1936,	£123	8	0	By Balance,	£144	8	0
,, 3 Life Compositions at £7,	21	0	0				
	£144	8	0		£144	8	0

Miss TROWER'S FUND.

To Balance from 1936,	£16	7	11	By Balance,	£16	7	11

BENEVOLENT FUND.

To Balance from 1936,	£41	3	6	By Balance,	£41	3	6

BALANCE-SHEET AT 31st DECEMBER 1937.

General Fund,	£180	12	0	500 National Savings Certificates, at cost,	£400	0	0
Publications Fund,	126	3	10	Cash at Bank,	108	15	3
Life Members' Fund,	144	8	0				
Miss Trower's Fund,	16	7	11				
Benevolent Fund,	41	3	6				
	£508	15	3		£508	15	3

(Signed) FRANCIS DRUCE, Hon. Treasurer.

8th February 1938.—Examined and found correct.

(Signed) H. W. PUGSLEY, Auditor.

SUMMARY OF PROCEEDINGS OF MEETINGS.

A meeting of the Committee was held on November 17th, 1937, at which the report of the Excursions Sub-Committee on the Excursions for 1937 was adopted. (A fuller account of the excursions appears on pp. 428-435 of this Report.) The terms of reference of the Excursions and Editorial Sub-Committees had not been exactly defined, and the following were agreed upon:—

Excursions Sub-Committee—To organise excursions in accordance with the recommendations set forth in the appendix, p. 390 of the 1936 Report.

Editorial Sub-Committee—(i) To select articles on botanical subjects for the Annual Report. (ii) To decide the admissibility of Plant Records. (iii) To keep up to date and to revise the *British Plant List* and the *Comital Flora*. (iv) To act as advisers to the Hon. Editor on all matters connected with the Society's publications.

The Rules Sub-Committee was re-elected, and it was decided that a separate notice of the date of the Conversazione should be circulated to members about two months beforehand.

At the meeting of the Committee on March 16th, 1938, the Hon. Secretary stated that the Society had been admitted an affiliated corresponding Society of the British Association and Dr Turrill was appointed to be the Society's Delegate to the British Association. The Hon. Secretary also stated that the Linnean Society, in response to the Committee's request, had arranged for a paper of interest to British taxonomic botanists to be read at their meeting the next day, for the benefit of members of the B.E.C. who had come to attend the Annual General Meeting. The recommendation of the Rules Sub-Committee, that it is at present unnecessary to alter the existing Rules, was adopted. The Committee decided there should be no " speeches " at the Conversazione but that a paper of botanical interest should be read after the Annual General Meeting. Mr Pugsley was re-appointed Hon. Auditor and the Hon. Secretary was re-appointed Distributor of the Exchange Club for 1938. A Sub-Committee, consisting of Mr Sandwith, Mr Wilmott, and the Hon. Secretary, was elected to answer the letter and questionnaire which had been received from the Association for the Study of Systematics in relation to General Biology. Mr Wilmott was co-opted to the Committee, and the Editorial, Excursions and Rules Sub-Committees were re-appointed for the ensuing year.

At the Annual General Meeting, held on the same date, 37 members were present, and the meeting was presided over by the Chairman, the Rt. Hon. H. T. Baker. After the adoption of the Hon. Secretary's and Hon. Treasurer's Reports and the election of Officers of the Society, as enumerated on p. 423, the following five Honorary Members were elected, on the recommendation of the Committee:— Dr P. Aellen, Heer P. Jansen, Dr K. H. Rechinger, Monsieur P. Senay, and Heer P. Vermeulen.

The thanks of the Society are due to the Linnean Society of London, in whose rooms at Burlington House the Society's meetings throughout the year were held.

REPORT OF THE HONORARY SECRETARY FOR 1937.

The membership of the Society continues steadily to increase, and the slight upward trend recorded in 1936 is maintained. I am glad to report that 22 new members were added to our register in 1937, and, after allowing for 11 resignations and seven deaths (including two Corresponding Members, whose number does not enter into these calculations), a total of six is the nett increase. I regret to record the death of the following in 1937 (in addition to those mentioned in the 1936 Report):—Lord Rothschild, Bolton King, and our Corresponding Member, R. F. Towndrow.

There must be many more potential members among individuals, libraries and institutions, and I would ask members to use their efforts in securing more subscribers to the Society.

The number of members active in sending in records and observations forms a small percentage of the total, and is not nearly so great as a Society with our membership should warrant. We have members scattered throughout the British Isles who have unequalled facilities for helping to provide a better geographical knowledge of our flora, and, in conjunction with the Referees, especially of the more critical genera. As was pointed out by the Honorary Editor on page 214 of the last Report, records to be of value need not necessarily be new County records, but any observations which provide some new knowledge will be welcomed. In the case of critical plants, these must be accompanied by voucher specimens, and I shall be pleased to receive from members any such fresh material for pressing, provided it is sent in a *tin*. At least two adequate specimens (several plants in certain cases) should be sent, the sender retaining a duplicate. Referees of critical genera are entitled to retain, should they wish, a specimen of everything they name, and one specimen is needed for the Herbarium of the British Museum, where it is at all times available for inspection. It would be a considerable help, in the case of dried specimens, if parcels reached me not later than October 31st. If members will comply with this request, the Referees, who give up much of their time in the interests of the Society, will be spared much extra trouble.

I should like to take this opportunity of expressing my thanks to Mr P. M. Hall for his valuable co-operation, and to Mr Wilmott and others, too numerous to mention, for their help in many ways.

The Society is deeply indebted to the Linnean Society for being allowed the use of their rooms during the year; to the authorities of the British Museum (Natural History), and of the Royal Botanic Gardens, Kew; and to the numerous Referees for their continued and willing help.

REPORT ON THE EXCURSIONS ARRANGED IN 1937.

May 22. An afternoon on Chalk Downs near Ranmore Common, Surrey. Leader, Lady Davy.

The weather was not fortunate for this the first excursion of the year. The clouds were low and heavy and at intervals during the afternoon it rained heavily. In spite of this, 24 members and friends assembled at Byfleet, whence we set off for Effingham Downs. Here were found a few plants of *Orchis ustulata* and plenty of *Polygala calcarea*. A small pond was covered with the showy flowers of *Ranunculus peltatus*, which had growing with it, in smaller quantity, *R. trichophyllus*. On a chalk slope between Ranmore Common and Gomshall a quantity of *Fragaria chiloensis* was found well naturalized, and a few plants of *Aceras* and *Cerastium pumilum* were found. The expedition concluded with tea at Gomshall, when a vote of thanks was passed to the leader.

June 14-19. Five days in Anglesey.

It is with regret that we have to record that this expedition—which was to have been led by Mr Norman Woodhead—was deprived of his leadership, and had to rely instead mainly on the map and on the help of Miss Armitstead and of other members who had previous knowledge of the island. That Mr Woodhead would be unable to lead was only known literally at the last minute—too late, of course, for provision to be made for a substitute.

Twenty-six members and friends attended, most of whom stayed at the headquarters, the Cliff Hotel, Trearddur, where we were fortunate in having the use of a large room each evening for discussion and the pressing of plants. The weather throughout could not have been better, and the hot and sunny days added considerably to the enjoyment of the expedition. Each morning the party set out at about 9.30 with sandwich lunch from the hotel and did not return until the evening. Excellent teas, with abundant supplies of the local fare, were had each day in villages close to the district being worked. For this service—difficult for a large party in Anglesey—thanks are due to Miss Armitstead, who had made the arrangements in advance.

Among the places visited and explored were Malldraeth Marsh, Cors Bodeilio, Newborough Warren, the N.E. of the island—Penmon, Wern, Red Wharf Bay, Gors Goch, Aberffraw Common, and the Trearddur Bay district. Of the results of the excursion, mention must be made of the finding of several rare Orchid hybrids, of *Juncus capitatus* in a new locality, and of *Rorippa sylvestris* and *Stellaria neglecta*, as well as several varieties hitherto unrecorded for v.-c. 52. A list of the more important and interesting plants found is given below; others have been incorporated in the Society's card-index as have the following:—

Ranunculus Drouetii F. Schultz. Malldraeth Marsh and Newborough Warren.
R. heterophyllus Weber, var. *submersus* Bab. Penmon Priory.
Nymphaea alba L., var. *occidentalis* Ostenf. Gors Goch.
Fumaria Bastardi Bor., var. *hibernica* Pugsl. Newborough Warren.
**Rorippa sylvestris* (L.) Sm. Trearddur Bay.
Viola lutea Huds., f. *Curtisii* (Forst.) Drabble. Newborough Warren.
Polygala oxyptera Reichb., with var. *dunensis* Dum. Newborough Warren.
**Stellaria neglecta* Weihe. Llanddona.
Arenaria serpyllifolia L., var. *macrocarpa* Lloyd. Shore near Penmon.
Sagina maritima Don. Shore near Penmon.
Geranium pusillum L. Newborough Warren.
Erodium Lebelii Jord. Newborough Warren.
Trigonella ornithopodioides DC. Rhosneigr and Newborough Warren.
Vicia Cracca L., var. *incana* Thuill. Roadside near Cors Bodeilio.
Callitriche intermedia G. F. Hoffm., var. *pedunculata* (DC.) Druce. Malldraeth Marsh.
Valerianella olitoria Poll., var. *lasiocarpa* Reichb. Newborough Warren.
Antennaria dioica (L.) Gaertn., var. *pedicellata* F. B. White. Arthur's Table.
Jasione montana L. (? var. *major* M. & K.). Roadside near Rhosneigr.
Digitalis purpurea L., var. *nudicaule* Saunders. Near Wern.
Veronica aquatica Benq. Newborough Warren.
Euphrasia curta Fr. ex Wettst. Newborough Warren.
E. occidentalis Wettst. Newborough Warren: near Holyhead.
Var. *calvescens* Pugsl. (with mauve flowers). Arthur's Table.
Mentha longifolia (L.) Huds. Farm-yard, Cors Bodeilio (Miss Vachell).
Thymus neglectus Ronn. Arthur's Table.
Ceratophyllum demersum L. Llyn Maelog.
Orchis L.: see "Plant Records," pp. 505 and 507.
Ophrys muscifera Huds. A small group of plants in the middle of Cors Bodeilio, a locality mentioned in *Fl. Anglesey* (Hon. W. J. L. Palmer).
Iris Pseudo-acorus L., var. *Bastardi* (Bor.). Malldraeth Marsh.
Juncus capitatus Weig. S.W. side of Newborough Warren.
Alisma ranunculoides L. Malldraeth Marsh.
Zannichellia pedicellata Fries. Penmon Fish-pond.
Heleocharis uniglumis Schultes. Newborough Warren: Red Wharf Bay: Four Mile Bridge.
Carex riparia Curtis. A curious plant was found in Malldraeth Marsh by Col. Watts which is, apparently, a form of this species. The fertile spikes were shorter than normal, the lowest being very distant on a long peduncle 12 cm. long, and the whole plant having a pendulous and very graceful habit.
C. Hostiana DC. × *lepidocarpa* Tausch. Gors Goch.
C. Oederi Retz., var. *oedocarpa* Anderss. Gors Goch.
C. panicea L., f. *tumidula* Laest. Cors Bodeilio: Gors Goch.
C. vulpina L., with an interrupted spike—var. *interrupta* Peterm. Malldraeth Marsh.
Anthoxanthum odoratum L., var. *villosum* Loisel. Red Wharf Bay.
Aira praecox L., var. *prostrata* Druce. Newborough Warren.
Koeleria gracilis Pers., var. *britannica* (Domin) Druce. Arthur's Table: Rhosneigr: Trearddur Bay.
K. albescens DC. Rhosneigr.
Briza media L., var. *albida* Lej. Gors Goch: Llan-fawr Quarry.
Poa pratensis L., var. *subcaerulea* (Sm.). Newborough Warren.
Puccinellia maritima (Huds.) Parl. Newborough Warren: Red Wharf Bay.
Scleropoa rigida Griseb. Gors Goch.
Festuca rubra L., var. *glaucescens* Heg. & Heer. Newborough Warren. Forma, Trearddur Bay: a form with more hairy fertile glumes, and more bloom, near Penmon.
Bromus hordeaceus L. (? var. *macrostachys* (Duval-Jouve) Druce). Newborough Warren.

Equisetum palustre L., var. *nudum* Newman. Newborough Warren.
E. variegatum (Schleich.) Weber, var. *arenarium* Newman. Newborough Warren: Aberffraw Common.

(Charophytes all named by G. O. Allen.)

Tolypella glomerata Leonh. Newborough Warren.
Chara rudis (Br.) Leonh. Gors Goch.
C. hispida L. Newborough Warren.
C. aculeolata Kütz. Newborough Warren: Gors Goch.
C. aspera Willd. Llyn Coron.
C. desmacantha Gr. & B.-W. Gors Goch.
C. delicatula Ag. Cors Bodeilio.

July 9-12. The Dorset Coast, St Alban's Head, westward to Osmington. Leader, Mr N. Douglas Simpson.

Seventeen members, who were about equally divided between the two hotels in Wareham, attended this excursion, and were rewarded by some delightful walks which had been arranged for them by Mr Simpson along this little known but, nevertheless, beautiful part of the Dorset coast. In glorious weather we set out on Saturday for Swyre Head, and, descending to the path along the cliff top, came across good specimens of *Veronica agrestis*. Walking in a north-westerly direction to Kimmeridge Bay the cliff path was fringed with *Carduus pycnocephalus*, var. *tenuiflorus*, for, one might truthfully say, hundreds of yards, and growing with it in lesser quantity was *Silybum Marianum*. Other interesting plants found on these cliffs above the Kimmeridge ledges were *Centaurium pulchellum*, var. *palustre*, *Pholiurus filiformis* and *Lathyrus Nissolia*. Retracing our steps and proceeding to Egmont Point, a few plants of *Ophrys apifera* were seen and *Euphrasia brevipila*, f. *subeglandulosa*, was collected. Walking up through the beautiful Encombe woods, the lakes were explored and two interesting forms of *Ranunculus Baudotii* were collected. Around the farm at Encombe were seen a number of fine trees of the Cornish Elm (*U. stricta* Lindley) which had, no doubt, been planted. Rejoining the cars at Swyre Head, we then visited Chapman's Pool—a small cleft in the cliffs having a small bog and a stream—where such plants as *Orchis praetermissa* and *Juncus obtusiflorus* were found. On the cliff side a few plants of *Pholiurus incurvus* were seen and fine specimens of *Euphrasia occidentalis*, var. *calvescens*, were gathered.

On Sunday we were not so fortunate with the weather, for we had only gone a short distance from Arish Mell on a walk to Mupe Rocks when heavy rain began to fall, accompanied by a thick sea mist. However, a few managed to get to Mupe Bay, and there found *Papaver somniferum*, var. *setigerum*, in fair quantity, *Gentiana Amarella* and a few plants of *G. anglica* in fruit. Returning to Arish Mell we took the cars to Tyneham, where, along the track leading to Worbarrow Bay, is a long line of the Dutch Elm (*U. major* Sm.). At Worbarrow Bay such plants as *Spergularia marginata*, var. *glandulosa*, *Erodium maritimum*, and *Carex hirta*, var. *subhirtaeformis*, were found, but on account of the drenching rain a longer search of this interesting bay and its cliffs had to be abandoned, and a very bedraggled party—for

the most part soaked to the skin—made for a very welcome tea which was awaiting us at the farm at Tyneham.

On Monday the weather dawned not much better, and when we approached the coast near Ringstead Bay we encountered a very thick mist, and the leader considered it dangerous in view of the nature of the coast to explore it in such conditions. Thus it was that we returned to Wool and wandered through the water meadows there. Among the interesting plants were found a quantity of *Lolium perenne* × *Festuca pratensis*, *Lolium perenne*, var. *longiglume*, and a specimen having longer glumes than is usual of the hybrid *L. perenne* × *F. pratensis*, which Mr Hubbard thinks may be *L. perenne*, var. *longiglume* × *F. pratensis*. Certainly they were growing in the same field and in fairly close proximity.

Thanks are due to Mr Simpson for leading this excursion and for his admirable arrangements. As most of the coast visited can only be approached through private property, it necessitated the securing of a number of permits.

The following plants were noted in addition to those mentioned above:—

Waste ground, Parkstone: *Delphinium Ajacis* L., *Rorippa sylvestris* (L.) Sm., *Sisymbrium officinale* (L.) Scop., var. *leiocarpum* DC., *Lepidium sativum* L., *Dracocephalum parviflorum* Nutt.

Chapman's Pool: *Polygala oxyptera* Reichb., with pink flowers, *Centaurium umbellatum* Gilib., var. *confertum* (Wheld. & Salm.) Gilmour.

Pool below Swyre Head: *Callitriche stagnalis* Scop.

Between Encombe and Kimmeridge: *Samolus Valerandi* L., *Centaurium littorale* (Turner) Gilmour.

Mupe Bay: *Melandrium macrocarpum* Willk. (=*Lychnis macrocarpa* Boiss. & Reut.).

Worbarrow: *Clematis Vitalba* L., var. *integrata* DC., *Trifolium fragiferum* L., *Lotus corniculatus* L., var. with tubercle-based hairs.

July 24. Canals and Reservoirs near Tring, Herts. Leader, Mr J. F. G. Chapple.

Seventeen members and friends met at Tring station on a glorious day and proceeded to explore a piece of the Grand Union Canal at Halton. Dr Butcher was, unfortunately, prevented by an injury from jointly leading the expedition as advertised. In a garden in Tring we were shown *Epilobium adenocaulon* and *E. roseum* by Mr Brenan, who had discovered these plants the previous day—*E. adenocaulon* being a new record for v.-c. 20. In the canal at Halton were seen quantities of *Ranunculus sphaerospermus* in its only Bucks locality, *Zannichellia palustris*, *Hippuris* and *Potamogeton crispus*. On the towpath a few plants of *Lolium perenne* × *Festuca pratensis* were seen. Proceeding to Wilstone reservoir, a fine plant of *Heracleum sphondylium*, var. *angustifolium*, was seen by the roadside; and around the reservoir a fair quantity of *Epilobium hirsutum* × *parviflorum* was noticed. In the reservoir itself a few scraps of the rare *Chara contraria*, var. *hispidula*, were dragged up, growing with *C. delicatula*. A few specimens of *Veronica Anagallis* × *aquatica* were seen

growing with the two parents in this, the locality where it was first noticed in Britain by Mr I. A. Williams. Time did not permit more reservoirs being visited, and after tea at Stocks, where the members of the excursion had been very kindly invited by Miss Margaret Brown, the party dispersed.

Other plants of interest, which were noted, included:—

Wilstone Reservoir (Herts.): *Ranunculus trichophyllus* Chaix, *Sagina ciliata* Fr., *Potamogeton lucens* L., *P. pectinatus* L.

Halton (Bucks.): *Ranunculus arvensis* L., *Erysimum cheiranthoides* L., *Agrimonia odorata* (Gouan) Mill., *Aethusa Cynapium* L., var. *agrestis* Wallr., *Solanum Dulcamara* L., var. *villosissimum* Desv., *Euphorbia exigua* L., *Potamogeton densus* L. (very abundant in the Grand Union Canal), *Avena fatua* L.

August 21-24. Frieston and the North Shore of the Wash. Leader, Dr R. W. Butcher.

The object of this excursion was to explore the northern shores of the Wash between Skegness and the River Welland. There was, among other old records, mention of *Limonium reticulatum* from Frieston Shore (Babington) and *Atriplex pedunculata*. Although careful search was made for these two plants they were not rediscovered.

The following sections of the area were explored by various members of the party: (1) Sandhills around Gibraltar Point; (2) Salt-marshes at Wrangle Tofts; (3) Salt-marshes at Frieston Shore; (4) Frampton Marsh between the Welland and the Witham; (5) Holbeach Marsh.

A list of the more interesting items in the flora is given below, the figures referring to the districts as above.

Name of Plant.	Number of districts in which seen.	Locality.
Thalictrum flavum L.	1, 3.	School Lane.
Ranunculus Baudotii Godr.	4.	Common in one dyke.
Ranunculus sardous Cr.	2.	Rare on the sea-bank.
Cochlearia anglica L.	1, 2, 3, 4.	Common.
Lepidium campestre (L.) Br.	1.	In slacks in the sandhills; rare.
Cakile maritima Scop.	1.	On the shore.
Cerastium semidecandrum L.	1.	In slacks in the sandhills.
C. tetrandrum Curt.	1.	In slacks in the sandhills.
Sagina maritima Don	1.	In slacks in the sandhills.
Spergularia marginata DC.	1, 2, 3, 4, 5.	Common.
S. salina Presl	1, 2, 3.	In bare wet places; common.
Althaea officinalis L.	1.	Marshes near the point. Near Frieston Church.
Erodium Lebelii Jord.	1.	On the sandhills.
Rubus caesius L., forma	1.	Dominant in the sandhills.
Sium latifolium L.	—	Rare, in some of the inland ditches towards Boston.
Apium graveolens L.	2, 3, 4.	Common.
Oenanthe Lachenalii C. Gmel.	1,	Marshes behind the sandhills.
Carum Carvi L.	3.	Butterwick.
Bupleurum tenuissimum L.	2, 3, 4.	Not common.

Name of Plant.	Number of districts in which seen.	Locality.
Peucedanum sativum (L.) Benth. & Hook.	1.	By the roadside.
Aster Tripolium L.	—	Common throughout the salt marshes. The rayed form was most abundant in the ditches behind the sea-wall. The discoid form was dominant on the open marshes.
Filago germanica (L.) Huds.	1.	In the slacks in the sandhills.
Gnaphalium uliginosum L.	1.	In the slacks in the sandhills.
Artemisia maritima L.	—	Both the erect flowered and drooping flowered forms were equally common and the variation was very great.
Limonium vulgare Mill.	—	Common on all the marshes.
Statice maritima Mill.	—	Common on all the marshes.
Glaux maritima L.	2, 3, 4, 5.	Very common.
Samolus Valerandi L.	2, 3,	Rare.
Plantago Coronopus L.	1, 2, 3.	Common.
P. maritima L.	2, 3, 5.	Dominant.
Chenopodium ficifolium Sm.	—	Arable land near Frieston Church.
Atriplex littoralis L. and var. *serrata* Gray	—	Both the type and the variety abundant in all the marshes.
A. patula L.	—	Common and very variable.
Salicornia spp.	—	These were not all determined, but *S. ramosissima* and *S. stricta* were the commonest. Neither *S. perennis* nor *S. dolichostachya* were observed.
Hippophaë Rhamnoides L.	1.	Common on the sandhills.
Spiranthes spiralis (L.) C. Koch	3.	On the sea-bank; rare.
Juncus Gerardi Lois.	1, 2, 3, 4, 5.	In wet places.
Triglochin maritimum L.	—	Often dominant on the marshes.
Zannichellia pedunculata Reichb.	2, 4.	In several ponds.
Ruppia maritima L.	2, 4.	In several ponds.
Scirpus maritimus L.	—	Common in the ditches.
S. Tabernaemontani C. Gmel.	1.	In ditches near the Point.
Carex distans L.	1, 3.	
C. vulpina L.	1.	In a marsh behind the sandhills.
Spartina stricta (Ait.) Roth	2, 3.	
Pholiurus filiformis (Roth) Schinz & Thellung.	2, 3, 5.	Common.

There were also many forms of *Agropyron repens* and *A. pungens* which have not yet been determined.

August 22. A party, consisting of Miss M. Brown, Miss M. S. Campbell, Mr Fred Kime (a Boston naturalist), Col. G. Watts and Mr A. J. Wilmott (leader), went southwards to explore the southern shore of the Wash east of the mouth of the River Welland. (Specimens of all plants here mentioned are in Herb. Mus. Brit.)

The country passed through south of Boston was almost entirely arable fields, and the first stop was made on the east side of Fosdyke Wash near Foster's farm, by some water just inside the sea wall. The water contained much *Ruppia* (without fruit) and around the bank was a zone of *Carex distans* about three feet high. Among a stand of

tended that he should enter the Indian Civil Service, but he failed to pass the medical examination. In 1902, however, he was appointed as an assistant in the Leicester City Museum and later became Sub-Curator. It was while employed at the Leicester Museum that Horwood published numerous books and papers on botanical subjects. The more important of these are "Plant Life in the British Isles" (3 vols., 1914-16), "Practical Field Botany" (1914), and "The Outdoor Botanist" (1920). When, in 1911, it was decided to publish a new Flora of Leicestershire, Horwood became general editor. Work on the Flora, however, was delayed by the war and also by the loss of his co-workers through death and other causes. Finally he had to undertake the work single-handed and to finish the Flora in time for the visit of the British Association to Leicester in 1933. A review of the Flora appeared in this Society's Report for 1933, p. 493.

Horwood left Leicester in 1922 and joined the staff at Kew in 1924. In the Herbarium he worked mainly on European and Oriental collections, and his spare time was occupied by very varied journalistic work. Although of a kindly and generous nature, he had fixed opinions as to methods of work and it was often only with difficulty that he could be persuaded to see another point of view. He will be greatly missed by the many amateur botanists who never sought his help in vain.

His large herbarium of British plants was divided between the Leicester Museum, the National Museum of Wales, and the Kew Herbarium. He was buried at Scraptoft Cemetery, Leicester, and is survived by four sons and his second wife.—A. K. JACKSON.

ROBERT F. TOWNDROW (1845-1937). R. F. Towndrow, who died on Christmas Day 1937, was born on October 29th, 1845, at Malvern Link, and he spent the whole of his life in that part of Worcestershire. For many years he carried on a grocery business in Malvern Link, and when he retired 26 years ago he moved from there to Malvern Wells, where he spent the rest of his life. He celebrated his Diamond Wedding in 1929, when he was honoured by a telegram of congratulation from King George V. Mrs Towndrow, whose beautiful nature had helped him so much in their long married life, and to whom he was utterly devoted, died three years later, and he never really recovered from this loss. For many years he was a member of the Board of Malvern Hills Conservators, and he only gave up that work with advancing age.

In his earlier years Towndrow was a keen entomologist, and never lost his interest in that pursuit. Along with Rev. A. Day of Malvern Link he did much work for local entomology, and being anxious that the knowledge which W. Edwards had of this branch of the natural history of Worcestershire should not be lost, he helped to compile a list of the Lepidoptera of the County founded on his collection.

It was probably during his early thirties that Field Botany began to take the chief place in his mind, and for a great many years he was the authority for the plants of the Malvern district and other parts

of Worcestershire, and Herefordshire. His chief distinction lay in his discovery of *Sagina Reuteri* Boiss. on the platform of Great Malvern Station in 1894; of *Rosa Melvini* Towndrow at Madresfield in 1885, of which only three bushes are known to be in existence; and his rediscovery in 1884 of *Juncus macer* S. F. Gray at Cradley in Herefordshire, which had been unknown in Britain since Don's record for Scotland in 1795.

Although his knowledge of Botany was very wide and his name well known outside his own district, he published very little, except locally. For several years he contributed notes on Malvern plants to the *Malvern Advertiser*, which were later incorporated in Amphlett and Rea's *Botany of Worcestershire*, and up to within ten years of his death he read papers to the Malvern Field Club. While being especially interested in *Rosa*, *Mentha* and *Carex*, his knowledge of general Phanerogamic Botany was very wide. He was extremely well read in general literature, and made careful notes of references to English plants in such writers as Shakespeare and Tennyson. If we consider how brief must have been his leisure hours when he was actively engaged in business, we cannot but marvel at the breadth of his interests and the amount of work that he accomplished in them. His Herbarium is in the Malvern Free Library.

With his modest and unselfish character, he was always ready to put his knowledge at the service of others and to contribute notes of his own researches. In fact, he would rather be inclined to give to others the credit for what he had done himself. It was in recognition of work of this sort that he was elected an Associate of the Linnaean Society in 1915. He contributed largely to Purchas and Ley's *Flora of Herefordshire*, especially in connection with the Roses of the Malvern neighbourhood. It is interesting to note that working with the late William Wickham, the geologist, on the relation of plants to soil, he anticipated some of the points of the later study of ecology.

Good botanist though he was, Towndrow's name will live, to all who knew him, for his personality and character, which was most generous and beautiful. He was completely unselfish and would never say a harsh or unkind word of anyone, while he was at the same time enlivened by a keen sense of humour. To the beginner in Botany he was not only a mine of information but an ever-ready source of help and encouragement; he was always glad to put his knowledge at the service of others, and even when correcting wrong identifications he was able to add a note of encouragement and congratulation. There are many who will always carry with them grateful recollections of walks which not only formed a foundation for the study of plant life but gave them an insight into the life of a great gentleman of truly saintly character.—F. M. Day.

John Grimshaw Wilkinson (1856-1937). John Grimshaw Wilkinson was born in Leeds on January 6th, 1856. He began life as a grocer, devoting his spare time to painting. A serious illness left him totally

blind at the early age of twenty-three. His interest in Botany was later aroused when, on an excursion with a friend, he was given a leaf from a beech tree he had known. This he examined with his fingers and tongue, committing its details to memory. This led to a study of the leaves and flowers of other plants until he ultimately achieved a remarkable power of identification from touch, taste, and smell, and became widely known as "The Blind Botanist." Throughout his earlier botanical studies he was assisted by his mother, who read him descriptions from Floras. These were carefully memorised, his powers of memory becoming scarcely less remarkable than his sensitiveness of touch and acuteness of hearing.

He was specially interested in British and foreign trees and shrubs and claimed to know over 1000 species and varieties in the public parks and private estates within a 20 mile radius of his house. His work on these plants brought him into contact with the City Corporation, whom he advised on the planting and labelling of trees in the public parks of the city. As an appreciation of this service and his remarkable achievements an honorary M.Sc. was conferred upon him by the Leeds University in 1915.

He died on February 28th, 1937, in his 82nd year, his herbarium and books being left to the Leeds University.—W. A. Sledge.

EDITORIAL NOTES.

Patrick M. Hall, Hon. Editor.

In the Report for 1936 members were invited to make suggestions for the improvement of the Report, either in the way of contents or arrangement. The amount of criticism received under these headings was small and was limited to a few members who found the arrangement of "Abstracts" difficult to follow. The Editorial Sub-Committee feel that this is a valuable feature of the annual Report, forming as it does a guide for members to a mass of information on various aspects of British Botany. The system of references has been carefully thought out and it is considered that, with careful attention to the notes provided, readers should not experience difficulty in understanding the system.

In connection with the subject of arrangement, it will be noticed that a slight change has been made this year in the form in which "Plant Records" are presented. The form now adopted is simpler and more economical in printing than that formerly in use.

A more serious criticism, and one which has been made on previous occasions, is in connection with the late appearance of the Report. It is suggested that the contents of the Report were to some extent "stale news," but this is bound to be the case with any Report designed primarily to record the activities of the previous year. Admittedly the appearance of the Report at the commencement of the collecting

season would be most valuable. The Editorial Sub-Committee are well aware of this and are most anxious that the Report should, if possible, appear earlier in the year than has been the case. Two factors, however, have to be taken into consideration. A large part of the Report is a digest of an enormous number of facts, the data collected during the previous season. The collecting season itself extends well into the autumn, and in many cases it is only then that the plants are carefully studied and worked out. It will be seen, therefore, that a considerable period must elapse for the whole of the contents of the Report to reach the Editor. The second, but not lesser, consideration is the question of accuracy. Time could no doubt be saved if every contribution were printed as submitted, but this does not commend itself to the Sub-Committee, who are determined to maintain, and, if possible, improve upon, the standard of accuracy (in such matters as identification, nomenclature, etc.) which was attained in the 1936 Report.

I am glad to have this opportunity of expressing my thanks to many members of the Society for their help, to Mr Chapple and my colleagues on the Editorial Sub-Committee for unfailing co-operation, particularly to Mr Corstorphine, whose constant advice in connection with the technical production of the Report is invaluable.

Plant Records. All records should give the following data:—

(a) The specific (and, where applicable, varietal, etc.) name.
(b) Locality and Watsonian vice-county (the county alone will not suffice).
(c) Date.
(d) Name of finder, if not the person submitting the record.
(e) If the plant belongs to a critical group, the name of the expert by whom it was determined: if the plant has not been named by an expert, a specimen must be sent for determination. Records in critical groups will not be published unless this procedure has been complied with.
(f) If material has been dried, the Herbarium in which it is kept, so that it may be traced if required for study.
(g) Information as to the status of the plant (whether native, naturalised or casual), habitat, altitude, soil, etc., is desirable.

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The latest date for the acceptance of **Notes, Records,** and **Papers** is **January 31st** in each year: all such communications should be addressed to the **Hon. Editor.**

(*Authors of papers are allowed 25 reprints gratis and further copies at cost price.*)

. . . . . .

Plants for naming should be sent in **tins** to the **Hon. Secretary.**

PERSONALIA.

FLORA OF THE ISLES OF SCILLY.

The last separate account of the Flora of the Isles of Scilly appeared in 1864. Since that date the introduction of the Spring Flower industry and increased commerce has effected many changes in the plant-life, and it is to be expected that the compilation of a new Flora will provide a most interesting comparison. Mr J. E. Lousley, 7 Penistone Road, Streatham Common, London, S.W.16, will be pleased to receive any records or other data, and references to publications (other than the *Journal of Botany* and *B.E.C. Reports*) dealing with the Botany of these Islands.

FLORA OF THE OUTER HEBRIDES.

Miss M. S. Campbell, c/o Department of Botany, British Museum (Natural History), Cromwell Road, London, S.W.7, again appeals for any information on the Flora of the Outer Hebrides (other than that contained in the *Journal of Botany*, *Annals of Scottish Natural History*, and the *B.E.C. Reports*). She requests that any specimens recently collected be sent to her for comparison with Herb. Mus. Brit. and for confirmation of old records, and is particularly anxious to get into touch with any botanists who may be contemplating visits to v.-c. 110 in the near future.

The work on the Flora is progressing satisfactorily, and Miss Campbell thanks those members who kindly responded to her previous appeal.

THE PROGRAMME OF EXCURSIONS

arranged for 1938 was sent out to all members with the notices of the Annual General Meeting.

NOTICE.

THE 1938 CONVERSAZIONE

will be held at the Great Central Hotel, London, on Wednesday, November 16th, from 3 to 6 p.m.

Arrangements as in previous years. Tickets, price 3/6 per head, including tea, may be had on application to

Mrs Foggitt, Stoneybrough, Thirsk, Yorks.

Please enclose cheque or postal order, and stamps for reply. A few friends may be invited.

PLANT NOTES.

[In the case of direct contributions the name of the author of the Note is printed in small capitals. Where the name of the author is not in small capitals, and is coupled with a date (the name and date, or date alone, being bracketed), the Note is an Abstract, its origin being ascertainable by reference to the Bibliography.—ED.]

3/2f. ANEMONE NEMOROSA L., var. **grandiflora** Rouy & Fouc. 8, S. Wilts; near Redlynch, 1933, Gullick (1937, 82), det. Kew. "Plante plus robuste; feuilles plus largement lobées; fleurs très grandes, atteignant 7 centimètres de diamètre": R. & F., *Fl. Fr.*, *1*, 44 (1893). Milne-Redhead and Turrill in *J.B.*, *70*, 325-328 (1932) describe specimens from S. Hants which they refer to this variety rather than to var. *robusta* Salisb., although they were "unable to find any sharp line of demarcation between these two described varieties."

6/33. RANUNCULUS FICARIA L. A curious form was noticed at Oaksey, N. Wilts (7) in 1932-5. It has apetalous flowers and numerous small trilobed leaves apparently intermingled with the sepals. Fascicles of similarly-formed leaves sprang from the axils of the upper leaves. A root was transplanted to Potterne by Mr E. M. Marsden-Jones and the plant has remained true.—Grose (1937, 87).

36. BARBAREA Br. An account of the Swedish species is given (with details of distribution) by Lange (1937). *B. arcuata* (Opiz) Rchb. is separated from *B. vulgaris* R. Br., and hybrids are recognised. The characters used in the key are:—

Siliques straight, on ascending pedicels, ± tightly appressed to the stem and with c. 3 mm. long style. ... *B. vulgaris.*
Siliques arcuate-ascending on spreading pedicels, standing out from the stem and with c. 2 mm. long style. *B. arcuata.*

[The plant called *B. vulgaris* seems to be merely the var. *silvestris* Fries: *cf.* Jackson, 1916: *J.B.*, 206.—A.J.W.]

80/1c. RAPHANUS RAPHANISTRUM L., var. **aureus** Wilmott. See p. 539.

85/3. RESEDA LUTEOLA L. One of several abnormal plants growing at Newhaven, E. Sussex, v.-c. 14, was sent to Kew, whose reply was:—"The specimen shows a much more condensed inflorescence than is normal in this species. The flowers themselves show little abnormality except for increase in carpel number. Such contracted inflorescences are familiar to botanists, though the cause is unknown, but it may be an expression of some form of fasciation."—L. A. W. BURDER.

96/2. SILENE CUCUBALUS Wibel. A small reddish form with deformed organs from Newhaven, E. Sussex, v.-c. 14, was thought pos-

sibly to be var. *rubra* DC. Specimens were sent to Kew, and the reply was: "The *Silene* is *S. Cucubalus* Wibel. The variation in the colour of the specimens is due to an attack by the fungus, *Ustilago antherarum* Fr. This fungus attacks the anthers and produces its spores there in place of pollen."—L. A. W. BURDER.

101/3b. STELLARIA APETALA Ucr., var. **glabella** (Jord. & Fourr.) Rouy & Fouc. A form characterised by its glabrous sepals, which should perhaps be referred as a variety to *S. pallida* (Dum.) Piré (*S. Boraeana* Jord.). Alderney; Mannez Quarry, 1934. Not previously recorded for the British Isles but apparently not uncommon.—Jackson, Jackson, and Airy-Shaw (1937, 299).

117/3. **Malva neglecta** Wallr. (*M. vulgaris* Fries; *M. rotundifolia* auct. angl.) and 117/4. **Malva rotundifolia** L., p.p. (*M. pusilla* With.; *M. borealis* Wallm.). These are the correct names for these two species according to Morton (1937), who gives a key to these two species, *M. nicaeensis* All., and *M. parviflora* L. There are specimens of *M. neglecta* from Wallroth in Herb. Kew.

185/3. **Rubus scissus** W. Wats., "nom. nov." *R. fissus* Leight., *Fl. Shropsh.*, 225 (1841); *R. fissus* Rogers, *Handb. Br. Rub.*, 20 (200); *R. fissus* Focke, *Synop. Rub. Germ.*, 109 (1877), excl. citations of Babington's descriptions; non *R. fissus* Lindl. 185/4. **Rubus fissus** Lindl., *Synop. Br. Fl.*, ed. 2, 92 (1835), is the correct name *vice R. Rogersii* Lint. Lindley's name has been universally misapplied. Lindley intended this name to replace *R. fastigiatus*, a name which he had wrongly used for a Scottish bramble in ed. 1 (1829). His specimen labelled *R. fastigiatus* is still in Herb. Lindley and is the same bramble as that afterwards described by Linton as a new species, *R. Rogersii*.—Wm. Watson (1937 A, 162-163).

185/14c. **Rubus londinensis** (Rogers) n. sp. and comb. nov. (Section *Discoloroides*, Series *Imbricati*). *Turio* robustus, ramosus, obtusangulus, sulcatus, altus, arcu decurvus et apice radicans, primo pubescens demum calvus, perennis. *Aculei* remoti sed nonnulli geminati, longi, lanceolati, recti vel ascendentes. *Folia* majuscula, quinato-digitata; *petiolus* supra leviter canaliculatus, aculeis falcatis armatus; *foliola* omnia contigua vel vix imbricata, convexa, longi-petiolulata, supra strigosa, subtus ± discolora, late raro profunde serrata; *foliolum terminale* cordatum, suborbiculare vel interdum potius subquadratum, cuspidatum.

Ramus florens obtusangulus, pubescens, infra glaucescens; aculei subter paniculam recti vel declinati; *folia* ternata vel quinata, superiora ± discolora, foliolo terminali obovato-oblongo. *Panicula* eglandulosa, ampla et aperta, truncata, pubescenti-tomentosa, aculeis gracilibus paucis vel subnullis munita; *ramuli medii* saepe longi, cymoso-partiti, 5-7-flori, subinermes. *Sepala* pubescentia, cano-virentia, tomentosa, obtuse carinata, appendiculata, reflexa. *Petala* magna, late ovata vel obovata,

emarginata, ad basin attenuata, roseola. *Stamina* alba stylos pallidos longe superantia; antherae glabrae vel subpilosae; germina pilosa; receptaculum pilosum.

Type specimen in Hb. W. Watson, Bickley, Kent.

Synonym, *Rubus imbricatus*, var. *londinensis* Rogers in *Journ. Bot.*, 1903, p. 89.

Distribution: Surrey, W. Kent, N. Essex.—Wm. Watson.

185/23b. Rubus cardiophyllus L. & M., var. **fallax** W. Wats., "var. nov." This is a small genetic form, which has white or at first faintly pinkish flowers, leaflets shortly acuminate nearly equally serrulate, a narrow closely felted and pubescent panicle, armed with many short but unequal straight rarely slightly falcate prickles, terminal leaflet of the upper ternate leaves on the flowering branch obovate-cuneate, the lower branches of the panicle equalling the petioles of the subtending leaves. It has been frequently identified with *R. Bakeri* F. A. Lees (=*R. Selmeri* Lindeb., var. *microphyllus* Lindeb., see below), which has sprawling stems, strongly curved prickles on the panicle rachis stem and petioles, thinly hairly panicle rachis, short stamens, pink petals, etc. It is at present known from v.-cc. 9, 12, 13, 16, 17, 39, 62, H.16.—Wm. Watson (1937 A, 161-162). [This is an example of the difficulty experienced in attempting to keep the *British Plant List*, ed. 2, posted up and emended in accordance with the additions and changes of nomenclature in a genus such as *Rubus*. This variety is numbered 185/23b, although the name *R. cardiophyllus* appears in the List under the number 185/25, because the plant to which Watson applies the name *R. cardiophyllus* L. & M., *R. rhamnifolius* W. & N., appears in the List as 185/23. Such cases are bound to occur until there is a complete revision of the List.—Ed.]

185/24(2). **Rubus cambrensis** W. Wats., "sp. nov." Series *Silvatici*. *R. glabratus* W. Wats. e descr. in *B.E.C. 1929 Rep.*, 169 (1930); non *R. glabratus* H. B. K. (1823). This bramble, which has been treated as a variety of *R. nemoralis* P. J. Muell., should stand as an independent species.—Wm. Watson (1937 B, 195-196).

185/24(3). **Rubus Silurum** (A. Ley) W. Wats., "sp. nov." Series *Silvatici*. This bramble has also been subordinated to *R. nemoralis* P. J. Muell., but is a species distinct from it and from *R. cambrensis*.—Wm. Watson (1937 B, 197).

185/33(2). Rubus similatus P. J. Muell., *Versuch* no. *50* (1859); Boulay in Rouy & Camus, *Fl. Fr.*, *6*, 54; *R. sylvaticus* Wirtg., *Fl. preuss. Rheinpr.*, 154 (1857), and *Hb. Rub. rhen.*, I no. 41, II no. 20; *R. villicaulis* var. Focke, *Syn. Rub. Germ.*, 209 (1877); *R. pyramidalis*, var. *similatus* Sud., *Rub. Eur.*, 46 (1908-1913), tab. L, f. 8.

This bramble is known to occur on the Continent, near Cherbourg, near Nancy, and on the summit of the Montabaurer Höhe, near Cob-

lentz. It has not hitherto been reported for Great Britain. I have known it for many years in Surrey, in several places between Croydon, Shirley and Selsdon; and recorded it, erroneously, as *R. calvatus* Bloxam, for Addington Hills, in the *London Naturalist* for 1927, page 15.

In Hb. Mus. Brit. there is a specimen of *R. similatus* which was collected by de Crespigny from a hedge bordering Croham Hurst, near Croydon, in 1872. It was determined by him, doubtfully, as *R. macrophyllus*, var. *glabratus* Bab. Rogers subsequently examined the specimen and said " perhaps a glabrous form of *R. macrophyllus*," but later (1890) " the connection with *macrophyllus* seems very doubtful."

In Hb. Kew there are specimens of the same bramble sent by Mr Edward Langley from near Woburn, Bedfordshire, where Rogers is said to have seen it abundantly. It was determined by Rogers provisionally as *R. Salteri* Bab., forma.

I have seen *R. similatus* once or twice in cultivation in England, and it is offered in catalogues as " Edward Langley." From enquiries that I have made, and from a note by Langley on the specimen at Kew, it appears that the cultivated bramble came from Bow Brickfield near Woburn.

I have grown the bramble from Addington Hills. The fruit is not large but has a pleasant aroma. I think it is closest of all to *R. mercicus* Bagn.

Mueller identified Wirtgen's specimens from the Montabaurer Höhe doubtfully as *R. incarnatus* P. J. Muell. (see *Pollichia* for 1859, pp. 95 and 294), but they do not agree with Mueller's description of *R. incarnatus*.

The following brief description of *R. similatus* is made from the Surrey plant.

Stem green to red, obtuse-angled, hairy, with scattered very short glands and rather short patent to falcate prickles. Leaves quinate, at first slightly strigose above and pilose on the veins beneath, but becoming nearly glabrous above and below. Terminal leaflet roundish ovate to elliptical, acuminate, base nearly entire, margin serrate-dentate, the principal teeth salient and often patent. All leaflets becoming convex and rugose. *Flowering branch* long, hairy, armed with strongly curved prickles, the upper simple leaves greyish felted beneath. Panicle leafy below, elongate, almost equal, the stronger branches sometimes divided to the base, inconspicuously glandular. Petals pinkish, elliptical, emarginate. Calyx truncate below, aculeolate and glandular. Sepals long-pointed, greenish-grey with a white margin, patent after flowering. Stamens white, about as long as the red styles. Carpels pilose. Receptacle pilose.

The habit is slender and recalls *R. pallidus*, as does also the red-styled flower. The underside of the petals where they have been exposed between the opening sepals is flushed with red.—Wm. Watson.

185/37b. Rubus Selmeri Lindeb., var. **microphyllus** Lindeb. in *Hb. Rub. Scand.*, no. 34 (1884). *R. Bakeri* F. A. Lees. *R. pistoris* Bart. &

Ridd., excluding specimens from Brandon Wood, Warwick, v.-c. 38, and Fradley, Staffs, v.-c. 39. This small form of *R. Selmeri*, which is found growing with the typical form in some localities, was described from an island lying off the south-west coast of Norway, in a region in which *R. Selmeri* is also found. This small form has also been found at Minden in N.W. Germany, where Weihe had already discovered the larger form. It is at present known from v.-cc. 16, 22, 38 (Sutton Park, *Bagnell*, 1873, in Herb. Bab., not Brandon Wood, *Riddelsdell*, 1922), 41, 58, 62, 63, 67 or 68, 98, H.38.—Wm. Watson (1937 A, 160).

185/41(2)b. **Rubus sciaphilus** Lange, var. **microphyllus** (Frid. & Gel.) W. Wats., " comb. nov." The variety is based on *R. sciaphilus* Lange, f. *microphyllus* Frid. & Gel., *Bot. Tidsskr.*, *16*, 73. This is a small variety analogous and rather similar to *R. cardiophyllus* L. & M., var. *fallax* W. Wats. (see above), from which it may be distinguished by its leaves green beneath, aciculate and glandular green sepals, pyramidal panicle becoming corymbose by the lengthening of lower axillary branches.—Wm. Watson (1937 A, 162).

185/53(2). **Rubus mundiflorus** n. sp. (*Silvatici*, Series *Sprengeliani*). *Turio* subteres, ex arcu humili procumbens, pilosus, parce glandulosus; *aculei* parvi vel mediocres, declinati, sat numerosi. *Folia* caulina ternata, quinata, pedata, mediocria; petioli patenter pilosi, sparsim glandulosi. *Foliola* omnia breviter petiolulata, inaequaliter serrata, supra opaca, pallide viridia, subtus praecipue in venis pilosa; *terminale* ovatum, suborbiculare, breviter acuminatum, basi emarginatum.

Ramus florens paene teres, flexuosus, dense breviter pilosus; aculei perpauci parvi, declinati vel falcati. *Inflorescentia* lata, sursum angustata truncata; *ramuli medii* patentes cymosi (ex quibus unus saepe hemicymosus vel duo oppositi) 4-7-flori; *pedicelli* longi, pilosi, parce glandulosi, subinermes. *Flores* parvi; *petala* suborbicularia, subito unguiculata, tandem plane aperta atque adeo ad latera revoluta, rosea; *sepala* cano-virentia, albomarginata, pilosa, glandulosa, vulgo in apice lineari producta, sub anthesi et postea patentia; *stamina* alba, vel ad basin rosea, primum quam styli multo breviora. *Germina* pilosa.

Rubus axillaris Lej. (*R. scanicus* Aresch.), for which I have previously taken this bramble, differs in its larger flowers, its foliaceous-tipped sepals, its larger and more coarsely toothed leaflets, with the more prominent teeth patent to recurved, and especially in the constantly much less developed, more leafy panicle.

Type specimen in Hb. W. Watson, at Bickley, Kent, ex Netley Heath, Surrey.

Distribution: Netley Heath, Surrey, abundant; Mare Hill, Witley, Surrey, in one spot, *W.W.*; Burnham Beeches, Bucks., in one spot, *G. C. Druce* and *J. Chapple*, *W.W.*; Shotover Hill, Oxon., in one spot, *N. D. Simpson* and *W.W.*—Wm. Watson.

185/66d. Rubus pyramidalis Kalt., var. **parvifolius** (Frid. & Gel.) W. Wats., " comb. nov." Based on *R. pyramidalis* Kalt., f. *parvifolius*

Frid. & Gel., *Bot. Tidsskr.*, *16*, 86. Bewdley, Worcs., v.-c. 37, *Gilbert* in Herb. Kew, determined by Rogers as *R. rhamnifolius* Weihe & Nees, subsp. *Bakeri* F. A. Lees. Fradley, Staffs., v.-c. 39, *Bagnell*, 1897, Ref. No. 4036, determined by Barton and Riddelsdell as their *R. pistoris*.—Wm. Watson (1937 A, 160).

185/69. **Rubus leucostachys** Smith. Since the time of Babington and Bloxam it has been taken for granted that *R. leucostachys* Sm. and *R. vestitus* Weihe are identical, and the only point in dispute has been as to which is the correct name. Specimens which are clearly Smith's type-specimens are in Herb. Smith. These are not *R. vestitus* but a distinct species which is frequent in S.E. England. This was described in *B.E.C. 1927 Rep.*, 503 (1928), under the later synonym *R. leucotrichus* Sudre.—Wm. Watson (1937 B, 198-200).

185/71×47. **Rubus macrothyrsus** Lange × **ulmifolius** Schott. See *B.E.C. 1936 Rep.*, 398, 1937.

185/88(2). **Rubus vectensis** W. Wats., "nom. nov." Series *Apiculati*. *R. Borreri* Rogers, *J.B.*, *30*, 270 (1892), e descr.; *R. Borreri* Focke, *Rub. Eur.*, 232; *R. Borreri* Sudre, *Rub. Eur.*, 120; non *R. Borreri* Bell Salter, *Ann. Nat. Hist.*, *15*, 34, nec W. Watson, "London Naturalist" for 1930, 72. *R. Borreri* Salt. is without doubt only *R. Sprengelii* Weihe, as was recognized by Salter himself. In Herb. Borrer there is a specimen named *R. Borreri*, collected by Salter in the Isle of Wight in 1845. This specimen is not *R. Sprengelii* and does not agree with Salter's description of *R. Borreri*. Rogers used this specimen for his description of *R. Borreri* in *J.B.*, *30*, 270 (1892). A new name is required for this species of which specimens have been seen from v.-cc. 9, 10, 13, 14, 16, 34, 35, 36, H.1, and from Guernsey.—Wm. Watson (1937 B, 197-198).

185/89. **Rubus rotundifolius** (Bab.) Blox. apud Kirby. This name should not appear under *R. hirtus* W. & K. (as 185/140b. in the *Br. Pl. List*, ed. 2) but should be substituted for *R. Drejeri* G. Jens. See p. 569 below.—WM. WATSON.

185/91. **Rubus Leightoni** Leighton, *Fl. Shropsh.* (1841). This is the oldest name for this species, which was placed next to *R. radula* Weihe by Leighton, and supersedes the later synonyms *R. linguiformis* Genev., *Mém. Soc. Acad. Maine-et-Loire*, 63 (1860), *R. ericetorum* Lefv., *Bull. Soc. Bot. Fr.*, 223 (1877), and *R. radula* subsp. *anglicanus* Rogers, *Handb. Br. Rubi*, 63 (1900). This species, which has been much confused with *R. sectiramus* W. Wats., has been seen from v.-cc. 3, 9, 10, 11, 17, 31, 38, 40 and 55.—Wm. Watson (1937 A, 156).

185/100. **Rubus phaeocarpus** W. Wats., "nom. nov." Series *Apiculati*. *R. Babingtonii* e descr. in Rogers, *Handb. Br. Rubi*, 69 (1900), non Salter. The specimen on which Salter founded his *R. Babingtonii* is still in Herb. Br. Linn., and is only a strong example of *R. scaber*

Weihe & Nees, as was admitted by Babington in *Br. Rubi*, 187 (1869). The name *R. Babingtonii* Salter should have dropped out of use, but unfortunately Rogers in his " Handbook " applied the name to a different bramble, for which it is necessary to find a new name.

The variety *phyllothyrsus* (Frid.) of " *R. Babingtonii* " Rogers stands for a bramble from Crowell Hill, Oxon, which is *R. festivus* M. & W. The Surrey bramble once identified as *R. Babingtonii*, var. *phyllothyrus*, is a different species, *R. formidabilis* L. & M.—Wm. Watson (1937 A, 156-157).

185/102(2). **Rubus Turneri** W. Wats., " sp. nov." Series *Grandifolii*. Most nearly allied to *R. Lejeunei* Weihe & Nees, from which it is distinguished by having leaves green beneath with the leaflets sharply lobate-serrate and very shortly stalked, by the absence of long prickles on the panicle, by the crowded and leafy panicle with ascending lower branches, by the white flowers, long linear-pointed sepals and other characters. The species is founded on specimens in Herb. Smith from Dawson Turner and Borrer from Rydal Woods, Westmorland. It is also recorded from v.-cc. 2 and 72.—Wm. Watson (1937 A, 158-160).

185/108(2). RUBUS THYRSIFLORUS Weihe. A full description of this species is given by Wm. Watson (1937 B, 201-202). It is especially frequent in the woods of Buckinghamshire and occurs elsewhere in S.E. England.

185/115. RUBUS SCABER Weihe & Nees. As described by the authors the sepals are reflexed after flowering but this character must have been noted very soon after the fall of the petals. In British *scaber* the sepals are sharply reflexed in flower, but rise very soon after flowering to patent and erect. This is in agreement with Focke's description of German *scaber*.—Wm. Watson (1937 A, 158).

185/145. RUBUS TERETICAULIS Rogers, non P. J. Mueller. The *R. tereticaulis* of Rogers' " Handbook " was based on E. F. Linton's Norfolk specimens identified by Focke. Linton's specimens differ irreconcilably from Mueller's description and from authentic specimens of his *tereticaulis*. They also differ from *R. Menkei* Weihe, with which they were identified by Sudre. Linton considered it to be a form of *R. Bellardii*, presumably var. *dentatus* Bloxam, the only form then named. This is synonymous with *R. scaber* Weihe & Nees and re-examination of Linton's specimens and of fresh specimens from his Norfolk localities show them to be *R. scaber*. The name *R. tereticaulis* P. J. Mueller should not be retained in the British list.—Wm. Watson (1937 A, 157-158).

185/149(2). **Rubus myriacanthus** Focke, *Abh. Naturw. Ver. Brem.*, 467 (1871). The Corylifolian bramble generally identified as *R. diversifolius* Lindl. [185/149d. of *B.P.L.*, ed. 2] does not agree with Lindley's

descriptions or specimens. *R. diversifolius* Lindl. is merely a later synonym of *R. vestitus* Weihe and must be dropped in favour of Focke's name.—Wm. Watson (1937 B, 200-201).

189/1. POTENTILLA FRUTICOSA L. The well known colony 1½ miles S.W. of Ballyvaghan, Clare, v.-c. H.9, was visited on June 13th, 1937, in the company of Dr R. C. L. Burges. It was noticed that the flowers occurred in two forms: (1) the common form with obovate deep golden yellow petals, rounded at the apex, 10 to 12 mm. long; (2) an unfamiliar form with deep chrome-orange mucronate petals, 5-6 mm. long and shorter than the calyx. The two forms occurred on distinct bushes, and the second was the less common. Hooker remarks: "In Teesdale the flowers appear to be functionally 1-sexual; the sexes differ in appearance" (*Student's Flora*, 124, 1884), but no sexual differences could be distinguished between the Ballyvaghan forms. In Herb. Mus. Brit. flowers similar to the second form appear on two sheets: (a) A specimen from J. Dickson's "Hortus siccus Britannicus, 1793-1799" marked "Gardens," and (b) from "Border of Lough Corrib, Galway, June 1832," ex Herb. R. J. Shuttleworth, which bears both the ordinary form and the variation on the same sprig. It may be added that when in Teesdale about six weeks later two colonies of *P. fruticosa* were examined but only flowers of the first form were found, but it was noticed that here the petals were uniformly paler than at Ballyvaghan.—J. E. LOUSLEY.

191/1. AGRIMONIA EUPATORIA L., forma ALBIFLORA Caspary. 34, W. Gloster; about 20 plants on a grassy roadside bank of a deep rhine, Oldbury Lane, 1927-9, E. Nelmes. This plant, not previously recorded outside E. Prussia, has been grown at Kew and breeds true to the white colour, see *J.B.*, *67*, 341 (1929).—Sandwith (1937, 176).

194/5m. ROSA STYLOSA Desv., var. **congesta** (Rip.) R. Kell. Now for the first time published as British. It differs considerably from all previously-known British varieties of this species in its distinctly biserrate leaflets and hispid-based styles. Its nearest (or rather least distant) British relative is var. *Garroutei* (Pug. & Rip.) Rouy, a far from satisfactory, ill-defined, rare inhabitant of southern England, obviously regarded with little favour by Wolley-Dod in his "Revision of the British Roses." The first definitely accepted record of var. *congesta* in Britain was made from specimens collected by my sister, Mrs C. L. Wilde, near Thetford, W. Norfolk, v.-c. 28, 9th September 1934. (Ref. No. in my herbarium is R.1603.) The description in Keller's *Synopsis Rosarum S. E. M.*, p. 168, shows Mrs Wilde's gathering to be an unusually good fit, as Roses go. The whole gathering has been submitted to Col. Wolley-Dod, who confirms my diagnosis, only slightly qualifying his agreement by remarking that "only the best fruits show undoubtedly hispid styles." On this point, I must add that, despite late gathering with consequent weathering, a good proportion of the 40 or more fruits show ± hispidity at bases of styles.

A Rose (also, like that above-mentioned, with eglandular peduncles) collected by me at Upton Heath, Northamptonshire, v.-c. 32, 12th September 1932, Ref. No. R.1131, was submitted to Col. Wolley-Dod, soon after its gathering. He then thought that it might " perhaps go under *R. stylosa*, var. *virginea* (Rip.) Rouy," though its leaflets were biserrate, and weakly pubescent on midribs. Further careful examination now reveals that the styles on some of its fruits are slightly hispid at their bases. In the light of experience gained from the Thetford *congesta*, I think it highly probable that the Upton Heath Rose should also come under that variety, as a less typical form, with leaflets scantily pubescent and with styles decidedly less hispid.

Yet another similar Rose, collected by Mr Hugh Phillips, near Felmersham, Beds, v.-c. 30, in October 1936, very late gathered and almost defoliated, submitted to me by Mrs Macalister Hall, is quite probably var. *congesta*, but further good material must be obtained before this can be confirmed.

These three gatherings seem to suggest that careful search may reveal further stations for var. *congesta* in our Eastern and East Midland Counties, and I shall be very pleased to examine any specimens of *R. stylosa* which may seem to fit that variety, in biserrate leaflets, eglandular peduncles, and hispid-based styles.—E. B. Bishop.

194/10×18. Rosa dumetorum Thuill. ? × R. obtusifolia Desv. All Stretton, Salop, v.-c. 40. Coll. H. J. Burkill, 9th and 13th September 1937. (Ref. No. R.2004). Leaflets uniserrate, pubescent on both sides, small; peduncles eglandular; fruit small, perhaps ovoid, but almost all ill-formed (suggestive of hybridity); styles glabrous. When fresh, there was a strong vinous suffusion over the whole gathering. This was much in evidence on prickles, flowering branches, stipules, bracts and fruit, even on teeth of serrations of leaflets. Both Col. Wolley-Dod and I agree that it is probably a *R. dumetorum* hybrid, and (by a process of elimination) can only suggest that *R. obtusifolia* is the most likely other parent. Clearly, *R. dumetorum* is the dominant partner, and obviously it is not one of those already named hybrids of which that species is assumed to be a parent. From above description and assumed parentage, circumstantial evidence seems to favour one parent being a glabrous-styled *dumetorum* (say var. *calophylla* Rouy) and the other a uniserrate-leafleted *obtusifolia*. Under the latter category our only British var. is *typica* W.-Dod, but that has hispid styles. So there we must leave it for the present, trusting that Mr Burkill will be able to give it further attention in 1938.—E. B. Bishop.

196/1s. Crataegus monogyna Jacq., var. **stricta** Loddiges. 34, W. Gloster; Nupdown, 1932, E. Nelmes: " looking like a hedgerow pear tree."—Sandwith (1937, 177).

282/1. Daucus L. The wild forms of the section *Carota* are monographically dealt with by Onno (1937). *D. maritimus* With. non Lam.

Rad. leaves usually elliptic, crenulate, obtuse, the inferior 2 mostly much longer and broader than the others; stem-leaves usually subbractiiform; stigm. usually 3. ..... ssp. *ibericum*.

Ssp. *anglicum* R. Schulz (*P. orbiculare* Benth. & Hook., *Brit. Fl.*, ed. vi, p. 273).

R. Schulz distinguishes the following forms (of *anglicum*):—

A. Slender stem; radical leaves ovate-lanceol. or lanceol., serrulate, acute. ..... var. *tenerrimum* R. Schulz.
   I. Petiole of inferior radical leaves $\leqslant$ limb. .....
      subvar. *brevifolium* R. Schulz.
      1. Rad. l. glabrous or only ciliate on the border. ..... f. *glabrum* R. Schulz.
      2. Rad. l. ± hairy. ..... f. *hirsutum* R. Schulz.
   II. Petiole of inferior rad. leaves $\geqslant$ limb. .....
      subvar. *longifolium* R. Schulz.
      1. Rad. l. glab. or only cil. border. ... f. *glabrescens* R. Schulz.
      2. Rad. l. ± hairy. ..... f. *pilosum* R. Schulz.

B. Slender stem; inferior radical leaves elliptic, obtuse, crenulate. ..... var. *ellipticum* R. Schulz (1).

C. Fistular stem, leaves very near one another, 3 stigm. var. *anomalum* R. Schulz (2).

(1) 2 French localities: Cher: Arçay, Seine and Marne: forêt de Fontainebleau.

(2) 2 do. also Fontainebleau, and Ballon d'Alsace.

(1) Recorded from the Haute-Marne, after Fournier, and parallel to f. *glabrescens* of var. *tenerrimum*.

P. Senay.

435/2. Campanula latifolia L. There is considerable variation in the colour of the flowers and the descriptions of the colours in British text books is inaccurate and conflicting. The normal colour is violet-blue. In some habitats (e.g. in Perthshire and in S. Bavaria) white flowers occur to the exclusion of other colours or preponderate. In some districts of Yorkshire the flowers are relatively small and of a very pale lilac colour.—Pugsley (1937).

460/3. Colour Forms of Primula veris L. With reference to *B.E.C. 1936 Rep.*, 226 (1937), there is a meadow near Salisbury, S. Wilts, in which there were over 50 plants of cowslips with coloured flowers on April 28th, 1937. They have been there at least eight years to my knowledge. The meadow adjoins a cottage garden which has fine plants of "Polyanthus," and there can be no doubt that the colour is derived from them by hybridization. The form of the flowers is always that of the cowslip but most of the plants are very vigorous; the colours range through orange to brown and crimson. In the next meadow all are normal cowslips.—B. Gullick.

478. CENTAURIUM Hill, emend. Adanson. This is the correct generic name according to Gilmour (1937) in a review of the nomenclature of the British species. The enumeration of the species and varieties is as follows, that portion of the species usually regarded as "typical" being given a varietal name:—

1. *C. umbellatum* Gilib.
   a. Var. **Centaurium** (L.) Gilm., "stat. nov." [478/1 of *B.P.L.*, ed. 2.]
   b. Var. **fasciculare** (Duby) Gilm., "comb. nov." *Erythraea Centaurium* (L.) Pers., var. *conferta* Wheld. & Salm. [478/1d.]
   c. Var. **subcapitatum** (Corb.) Gilm., "comb. nov." *E. Centaurium* (L.) Pers., var. *capitata* Koch sec Wheld. & Salm., non Koch. [478/1b.]
   d. Var. *sublitorale* (Wheld. & Salm.) Druce. [478/1e.]
2. *C. capitatum* (Willd. ex Cham.) Britten & Rendle. [478/7.]
3. **C. littorale** (Turner) Gilm., "comb. nov." [478/2.]
   a. Var. *littorale* (Turner) Gilm., "comb. nov." [478/2d.]
   b. Var. *occidentale* (Wheld. & Salm.) Gilm., "comb. nov." [478/2b.]
   c. Var. *Baileyi* (Wheld. & Salm.) Gilm., "comb. nov." [478/2c.]
   d. Var. **minor** (Hartm.) Gilm., "comb. nov." *E. compressa* Hayne, var. *Friesii*, forma *minor* Wheld. & Salm.

   ×*umbellatum* = × *C. intermedium* Druce.
4. *C. pulchellum* (Swartz) Druce. [478/4.]
   a. Var. **palustre** (Gaud.) Druce. [478/4c.] The earliest epithet for the species is *pulchellum*, which was given by Swartz to the dwarf simple form illustrated in Butcher & Strudwick (*Further Illustr. Brit. Pl.*, t. 248, Z) as f. *Schwartziana* With. The earliest varietal name for this form is *E. pulchella*, var. *palustris* Gaud.
   b. Var. **ramosissimum** (Gaud.) Gilm., "comb. nov."
   c. Var. **intermedium** (Mérat) Gilm., "comb. nov."

   ×*umbellatum* = × *C. Wheldonianum* Druce.
5. *C. tenuiflorum* (Hoffmgg. & Link) Fritsch. [478/5.]
6. *C. latifolium* (Smith) Druce. [478/3.]
7. *C. scilloides* (Linn. fil.) Druce, var. *portense* (Brot.) Sampaio (1913), antedating Druce (1917).

497/1b. SYMPHYTUM OFFICINALE L., var. PATENS Sibth. A form occurs at Tockenham, N. Wilts (7), in which the corolla and calyx are 6- (and sometimes 7-) partite.—Grose (1937, 88).

543/3. VERONICA OFFICINALIS L. A very curious form of this species was collected in beechwood, Buckholt Wood, Cranham, East Gloucester, v.-c. 33, on July 4th, 1937. It differed from the typical form of the species in the long prostrate stems up to 35 cms. in length, rooting freely at the lower nodes, in the orbicular leaves with pedicels up to a

centimetre in length, and the small falsely terminal spikes of 6 to 10 flowers. There are no similar specimens in the Herbaria at Kew or South Kensington, though there is a general resemblance to a sheet labelled " f. *submontana* Westerlund, Bot. Not., 1888, 193," in the last named collection. The variation was uniform and plentiful in one part of Buckholt Wood and deserves further study.—J. E. Lousley.

543/9d. Veronica aquatica Benquerel, var. **glandulifera** Čelak. This variety, with the inflorescence more or less glandular, which was referred to in *B.E.C. 1927 Rep.*, 550 (1928), should be added to *Br. Pl. List*.—Ed.

558. Mentha L. *Nomenclature*. A set of Mints was presented by Sole to the Linnean Society in 1797 and has recently been rediscovered among the Society's miscellaneous collections. R. Forster's copy of Sole's book, with the author's marginal notes transcribed at his request, is also in the Society's possession. Sole's own copy with the original notes was to have been presented to the Society but apparently never reached it. The notes show Sole's reaction to Smith's " Observations on the British Mints," which appeared in *Linn. Trans.*, Vol. 5. With several of Sole's sheets now at Kew, they show that he disagreed vigorously with some of Smith's conclusions. A diagram traces the relations between the species and varieties proposed by Linnaeus, Sole, and Smith respectively. Sole was in bad health when the notes were written, which may account for his somewhat peevish tone, but with regard to the points at issue, it may be said that honours were easy.—Savage (1937 B).

558/1c. Mentha rotundifolia (L.) Huds., var. **elongata** Pérard. (=*M. gracilis* Malinv. non Sm. *M. rotundifolia*, var. *psilostachya* Topitz). Among a parcel of Mints submitted to me at Kew, I found an unusual form of *M. rotundifolia* from Manorbier, Pembrokeshire, which I thought might be this variety. Hearing that Mr J. D. Grose was visiting Tenby in September last, I asked him to look the plant up, which he did, sending me material. The variety differs from the forms commonly found in Britain in the long, slender spikes, with separated whorls in the lower half. The main spike may be 10 cm. long, and the lowest 5 or 6 internodes range from 1 cm. to .5 cm., becoming shorter upwards.

Pérard's very short description may be found in the key on p. 337 of *Bull. Soc. Bot. France, 17*, 1870. He gives the name as var. *elongata* Ten., but I have failed to find any reference to it in *Fl. Nap.* Malinvaud's name is invalid, having been used previously by Smith for a form of *M. gentilis*.

Briquet gives a full description under the name of var. *gracilis* Malinv. in *Lat. Alp. Marit.* Rouy in *Fl. Fr., 11*, says " *elongata* Pér.= var. *gracilis* Malinv. in Note ad Menth. Exsicc. No. 3." There is a sheet of this among the set of Malinvaud's Exsiccata in Herb. Mus. Brit., which corresponds quite well with the Manorbier plant.

Topitz also gives a description as var. *psilostachya* in " Menthenflora von Mittel-Europe," *Bot. Centralblatt, 30,* Abt. II, 144 (1913), and cites *M. gracilis* Malinv., noting that the name is invalid.—A. L. STILL.

558/6f. ×MENTHA PIPERITA L., var. **sylvestris** Sole. The mint known as *Mentha hircina* Hull is not a hybrid of *M. aquatica* × *longifolia* as has been supposed. Hairy forms of the Peppermint have been found in several localities where that species grows but *M. longifolia* is unknown. Still (1937) concludes that such forms are sports of *M. piperita* to which the varietal name *sylvestris* Sole should be applied. See also *B.E.C. 1936 Rep.*, 409 (1937).

588/3b. PLANTAGO CORONOPUS L., var. LACINIATA (Willk.) Pilger. Large plant, annual or perennial. Leaves numerous, more or less erect, rather rigid and thick, 10-20 cm. long, rachis linear or linear lanceolate, 4-5 mm. broad, apical segment elongate-lanceolate. Peduncle erect or arcuate-erect, 15-20 cm. long. Bracts setace-acuminate, longer than the calyx. Sepals on the back hairy, ciliate. Kent, W. Sussex.

588/3k. PLANTAGO CORONOPUS L., var. COLUMNAE (Gouan) Willd. Small plant with perennial root. Leaves somewhat rigid, 2-7(8) cm., rachis linear, apical segment lanceolate, lateral lobes conjugate, hirsute. Peduncle arcuate-ascending, longer than the leaves, 10-13 cm. Spikes generally short, narrow. Bracts about as long as the calyx. Isle of Wight, Cornwall.

Var. COLUMNAE Willd., subvar. **multipartita** Pilger. Often perennial, root thick. Leaves rosulate, 5-13 cm., lateral lobes on each side 5-6, rachis narrow, 2 or occasionally as much as 5 mm. broad. Peduncle ascending, 10-20 cm. Bracts equalling calyx or slightly longer. Sepals on back slightly hirtulous. Isle of Wight, Dorsetshire.

588/3l. PLANTAGO CORONOPUS L., var. STRICTA Pilger. Rather small plant with thick perennial root. Leaves rather thick, apical segment and lateral lobes lanceolate, 3-7 cm., slightly pinnati-partite, rachis 3-5(6) mm. broad. Peduncle erect or arcuate, ascending. Spikes 1.5-6 cm. Holy Island and Dublin.

The above three varieties of *P. Coronopus* L. are referred to in *B.E.C. 1931 Rep.*, 665 (1932), specimens from Hb. Druce having been identified by Pilger. Pilger's descriptions may be found in " Plantaginaceae," Engler's *Pflanzenreich, 4,* 269, 102 Heft.—E. G. BAKER.

588/8h. PLANTAGO LANCEOLATA L., var. ANTHOVIRIDIS Wats. Experimental cultivation during 1935 and 1936 showed that this variety breeds true. A fuller description than that originally published in *J.B.*, *59*, 355 (1921) is given by Walter Watson (1937).

588/8o. PLANTAGO LANCEOLATA L., var. **mediterranea** Pilger, subvar. **pilosa** Pilger, *l.c.* Leaves erect, longly petioled, reaching 30 × 5 cm.

with long scattered hairs. Peduncles reaching 70 cm. Corolla lobes broadly ovate, 2.25-2.5 mm., with a medium brown striation. Scotland, near Edinburgh.—E. G. BAKER.

593/2. HERNIARIA CILIATA Bab. In a revision of the material of the genus in the Berlin Herbarium, Hermann (1937, 213) refers *H. ciliata* to *H. maritima* Link, a Portuguese species, an identification doubted by Pugsley because that species has a woody root-stock, thick wrinkled stems and strongly hairy leaves and calyx. The author saw Cornish material (Vigurs) with a woody root-stock c. 1 cm. diam. at the crown, and stems 2-3 mm. with thick wrinkled cleft bark, and Portuguese specimens from Collares with completely glabrous leaves and sepals. The stouter growth in the South is presumed to be due to climatic influences.

[Comparison of British and Portuguese material in Herb. Mus. Brit. confirms doubts of the identity of *H. ciliata* and *H. maritima*. The British plant is never so hirsute. *H. ciliata* is represented from Santander and possibly both may occur in Portugal. The problem requires field study in Portugal.—A.J.W.]

600/8(2). **Chenopodium reticulatum** Aellen. Allotments near the station, Dorchester, Dorset, v.-c. 9, August 15th, 1937, J. E. Lousley & R. C. L. Burges. This species was described by P. Aellen in *Botaniska Notiser*, 1928, p. 205 seq., as follows: "Planta magna, robusta, plerumque copiose ramosa. Caulis grosse luteo- et viridi-striatus. Folia majora, 6 cm longa, 3.5 cm lata, oblongo-rhomboidea, interdum manifeste triloba, infra medium dente plerumque duplici lobiformi praedita; lobus medius marginibus plerumque parallelis, compluries dentatus, mucronatus. Folii petiolus 2/3 laminae adaequans. Folia superiora angustiora ovali-lanceolata (5 : 1½ cm), parce dentata vel integra, interdum hastata. Omnia folia levia. Inflorescentia glomeruloso-cymosa vel glomerulosa-spicata. Glomeruli mediocriter magni. Perianthii laciniae fructum includentes, leviter carinatae. Pericarpium valde adhaerescens, subfuscum. Semen magnum, 1-1¾ mm diametro, nigrum, nitidum, in superficie reticulatum, i.e. crate venularum ± regularium quadratarum inductum, area inter venulas ± levi vel tenuiter regulariter granulato-scabra." The Dorchester specimens determined by Dr Aellen bore a very close superficial resemblance to plants of *C. album* L. with which they were associated. The most important character distinguishing this species from *C. album* would therefore appear to be the very characteristic reticulation of the surface of the seed—visible only under the microscope.—J. E. LOUSLEY.

606/8. ATRIPLEX LACINIATA L. (*A. sabulosa* Rouy). A long discussion of the forms of, or related to, this species is given by Moser (1937), but is difficult to follow because of his confused nomenclature. Apparently he would include *A. Tornabeni* Tineo (p. 283) [in which case that name would take precedence of Rouy's], but in the plates it is referred to (p. 285) as *A. tataricum*, var. *Tornabeni* (Tin.) Gürke.

[By the type method *A. laciniata* L. is to be typified by the specimen in Herb. Clifford, the change of " annuo " to " herbaceo " being a mere orthographic improvement made consistently by Linnaeus in the definitions of *Atriplex* in the " Species Plantarum." The type specimen is *A. sabulosa* Rouy, a solution which short-circuits the series of illegitimate epithets antedating Rouy's *sabulosa*. The " obtuse-dentatis " of the definition clearly indicates *A. sabulosa* and not *A. tatarica* L. (the type of which is in Herb. Linn.) and destroys the implication of the epithet " laciniata," taken from the Bauhin synonym which is " *A. tatarica* " and not *A. sabulosa*. The sheet in Herb. Linn. marked " 5. *laciniata* " (without indication of origin) appears to be *A. Tornabeni* Tin.—A.J.W.]

633. ULMUS L. According to Bancroft (1937) it is impossible to classify the British Elms into " species " in the conventional sense, owing to the present plasticity of the genus, which is in an active state of evolution by hybridisation and variation. A " working classification " is proposed, which includes four " Standard Types " and four Elms " other than those conforming to ' Standard Types.' "

The four " Standard Types " are: *U. nitens* Moench; *U. montana* Stokes; *U. procera* Salisb. (" *U. campestris* " auct., non L.); *U. minor* Mill.

Of the four Elms which do not conform to the " Standard Types," ×*U. vegeta* (Loudon) Schneider is considered to be truly intermediate between and an F_1 hybrid of *U. montana* and *U. nitens*. ×*U. hollandica* (Mill.) Moss also combines the characters of the same two species but approaches more closely to *U. nitens*. The two other forms, (? ×) *U. stricta* Lindl. and (? ×) *U. sarniensis* (Moss) " sp. nov.," appear to be of hybrid origin, combining in varying degrees the characters of *U. minor* and *U. nitens*.

This paper includes a key as well as an account of the general characteristics, distributional range and synonymy of the eight forms described.

650/10. SALIX ATROCINEREA Brot. It is surprising to read in the late J. Fraser's paper, " Revised Nomenclature of *Salix*," in *B.E.C. 1932 Rep.*, 369 (1933) that this species is " rare and little known in France." This is probably due to the fact that Fraser worked on older French floras, and that few French botanists work at Willows. An enlightening note by Ph. Guinier: Un Saule peu connu de la flore de France (*Salix atrocinerea* Brot.) in *Bull. Soc. Bot. Fr., 58*, session extraordinaire I, 1911, should not be overlooked by any salicologist, even by a non-specialist. The geographical distribution of *S. atrocinerea* covers at least the Western two-thirds of France (including Normandy, and extending as far as the rivers Yonne and Allier). Its western limit wants to be defined.

S. atrocinerea has an Atlantic distribution, while that of *S. cinerea* L. is Continental. Rouy makes *atrocinerea* a race of *cinerea*, while

the leading French salicologist, Dr M. Chassagne, who worked at the Willows with the late Dr Goerz in Germany, considers it to be a species.

Although reported to occur in Britain, I understand that *S. cinerea* L. is not accepted by British botanists as a British species. It appears to be desirable to check the presence of *S. atrocinerea* Brot. throughout Britain in order to make quite sure of the absence of the former.—P. SENAY.

Dr Floderus told me, when he revised the British Willows in the Museum, that the geographical range of *S. atrocinerea* was "Atlantic," i.e. most of France and in the Iberian Peninsula, whereas that of *S. cinerea* was more Scandinavian and Central European, not at all "Atlantic." The third species of the group is *S. pedicellata* Desf., a "Mediterranean" species. All our large series of British material is *S. atrocinerea*, and the occurrence of *S. cinerea* in the British Isles or Western France would be contrary to the known distributions of the species, I believe.—A. J. W.

650/10×6. **Salix atrocinerea** Brot. × **viminalis** L. A specimen in Herb. Kew from 6, N. Somerset, Walton-in-Gordano, 1899, J. W. White (as *S. rugosa* Leefe, see *Flora of Bristol*, 537, 1912) has been determined by Dr B. Floderus as this hybrid.—SANDWITH (1937, 179).

666/. EPIPOGIUM R. Br. The name has been spelt *Epipogium*, *Epipogum*, *Epipogon* and *Epipogion*. Under the International Rules, *Epipogium* is the correct spelling.—Sprague and Green (1937).

669/9. ORCHIS PURPURELLA T. & T. A. Stephenson. The specimens recorded by me below (see pp. 506-507) under this name show a considerable variety of labellum, from nearly "diamond-shaped" to broad like that of *O. praetermissa* Druce. The type of deeper marking is, however, quite different from that of *O. praetermissa*, and is sufficiently uniform to justify placing all together under *O. purpurella*. Generally the foliage is unspotted, but plants with small spots occur which are quite different from those of the hybrid with *O. elodes* Griseb., which are obvious and frequent when the two species grow together. I find it impossible at present to draw any line between the extreme var. *pulchella* (Druce) Pugsl.—often uniform where it occurs—and typical *O. purpurella*. Moreover, other peculiar forms are met with, not referable to either.

The fine flowered plants with heavily spotted leaves from the north coast of Scotland may, I now think, prove to be **O. occidentalis** (Pugsl.) Wilmott, "comb. nov." (see p. 551 below), but I think I have eliminated any which may be that species from those I have now recorded as *O. purpurella*.—A. J. WILMOTT.

718/13. JUNCUS SQUARROSUS L. A curious abnormal condition occurs in which the whole plant is stunted with the flowers congested in small compact inflorescences, the bracts and perianth-segments being

whitish or whitish-hyaline with a brown tinge, and the fruit small and green, rounded and blunter than that of the typical form, with abortive seeds. No evidence has been discovered of attack either by fungus or insect. Specimens have been seen from the following localities: Moor N. of Rough Hill, Surrey, v.-c. 17, 1925, C. E. SALMON (Herb. Kew). Coniston, Westmorland, v.-c. 69, 1902, Rev. W. WRIGHT MASON (Herb. Druce). Melmerby, Cumberland, v.-c. 70, 1923, Rev. W. WRIGHT MASON (Herb. Druce). Moorland near Foss, on S. side of Loch Tummel, Mid-Perth, v.-c. 88, July 1936, in quantity, C. I. and N. Y. SANDWITH. Sands of Barry, Angus, v.-c. 90, July 1936, C. I. and N. Y. SANDWITH.—N. Y. SANDWITH.

753/49m. CAREX GOODENOWII Gay, var. **hebridensis** (Ar. Benn.) Wilmott. See p. 555.

753/77. CAREX VULPINOIDEA Michaux, *Fl. bor.-amer.*, *2*, 169, 1803. (*C. vulpinoides* auct. angl.). Native of North America and Columbia, naturalised in Europe and Australasia. Six large clumps in an old pit near Farnborough, W. Kent, v.-c. 16, July 14th 1937.

This species was first found in Britain by G. Nicholson who collected it from the "Banks of the Thames at Kew, Surrey," in 1880 (Herb. Kew). Although apparently it did not persist in this locality, it was included in subsequent editions of Babington's *Manual* and the *London Catalogue*, and hence in Druce's *Plant List*. The only later gatherings of this plant in Britain so far as I am aware are:—(1) A sheet in Herb. Mus. Brit. labelled "Probably from Acton (dust heap)? Coll. A. Loydell, 19/9/1907, Herb. J. E. Cooper;" (2) Avonmouth Docks, 1932, Gibbons (C. I. Sandwith, "The Adventive Flora of the Port of Bristol," *B.E.C. 1932 Rep.*, 359 (1933)).

At Farnborough the species was very well established and several of the clumps may have been the result of several years' growth. The banks of the old chalk-pit in which it grew still produced a natural chalk flora including *Verbascum Lychnitis*, var. *album*, but in 1937 the end of the pit away from the *Carex* had been partially filled in with refuse and produced many alien plants. The end at which *Carex vulpinoidea* occurred had not recently been interfered with, and the most probable source of introduction of both this sedge and *C. Crawfordii* (see p. 515) was a series of timber "sleepers" laid down to form a cart road.

C. vulpinoidea is a species which shows a tendency to ready colonisation, and it is likely that it may one day succeed in establishing itself in a British habitat. In France it was observed at Bruailles near Louhans (Saone et Loire) in 1857, when it was described as a new species—*C. Moniezii* Lagrange (*Bull. Soc. Bot. France*, *4*, 163, 1857). At this station it persisted. More recently it has been noted in the Department of Tarn-et-Garonne. In Germany it has been found in Holstein and Pomerania, and elsewhere in Europe in the Caucasus and near Szepes in Hungary.—J. E. LOUSLEY.

737/23. POTAMOGETON PUSILLUS L. Examination of the type-specimen of this species in Herb. Linn. by Dandy and Taylor (1938) reveals that Linnaeus' name should be given to that species for which the name *P. panormitanus* Biv.-Bern. has been in use. The earliest valid name for "*P. pusillus*" auct. non L. appears to be *P. Berchtoldii* Fieb. The *British Plant List*, ed. 2, should therefore be amended to read as follows:—737/23. **P. Berchtoldii** Fieb. (*P. pusillus* auct. non L.). 737/25. **P. pusillus** L. (*P. panormitanus* Biv.-Bern.), and these names are used in this sense below.

780. AGROSTIS L. The British species of this genus have been revised by Philipson (1937). In addition to a complete synonymy fully-detailed descriptions are given of the native species and shorter descriptions of the alien species occurring in Britain. There are two keys: one for the native species and their varieties, the other to include alien species as well as native. Other matters fully discussed include the anatomy, life-history, intra-specific variation, and distribution of the species. The taxonomic divisions used for expressing the conclusions reached as to variation within the species are varieties, ecads and minor variations. The author's conception of "varieties" is that they represent two or more sub-divisions of the species, equal in rank, the subdivision which is considered typical of the species being treated as a variety also. In addition a number of diseased states are referred to, some of which have in the past been treated taxonomically as varieties or even species (see Philipson (1935 A)—abstract in *B.E.C. 1935 Rep.*, 150 (1936)). A large number of the varietal names in the *British Plant List*, ed. 2, are referred to the "minor variations," which are not given names in the following arrangement which is that of the revision. The numbers in square brackets are those of *Br. Pl. List*, ed. 2.

A. *British Species and Varieties.*

Section I. TRICHODIUM (Michx.) Trin. Species with the palea less than ¼ the length of the lemma.

1. *A. setacea* Curtis, *General Obs.*, 4 (1787). [780/4.]
2. *A. canina* L., *Sp. Pl.*, ed. 1, *1*, 62 (1753). [780/6.]
   Varieties. a. *fasciculatis* (Curtis) Sinclair, *Hort. Gram. Wob.*, 278 (1824). [780/6, vars. i and k.]
   b. **arida** Schlechtendal, *Fl. Berol.*, *1*, 45 (1823).
   Six minor variations.

Section II. *Vilfa* (Adans.) Roem. & Schult. Species with the palea more than 1/3 the length of the lemma.

3. **A. tenuis** Sibthorp, *Fl. Oxon*, 36 (1794). [780/3.]
   Varieties. a. **hispida** (Willd.) Philipson, "comb. nov." [780/3.]
   Four minor variations.
   b. *humilis* (Aschers. & Graebn.) Druce, *Br. Pl. List.*, ed. 1, 79 (1908). [780/3, var. d.]

4. **A. gigantea** Roth, *Fl. Germ.*, *1*, 31 (1788). [780/2, var. c.]
   Varieties. a. **ramosa** (S. F. Gray) Philipson, " comb. nov." [780/2, vars. c and h.]
   b. **dispar** (Michx.) Philipson, " comb. nov." [780/3, var. f. *A. nigra* With.]
5. **A. stolonifera** L., *Sp. Pl.*, ed. 1, *1*, 62 (1753). [780/2, var. f.]
   Varieties. a. **stolonifera** (L.) Koch, *Fl. Germ. et Helv.*, ed. 1, 781 (1837).
   Ecas. 1. **stolonifera** (L.) Philipson, " comb nov." [780/2, var. i.]
   2. **salina** (Jansen & Wachter) Philipson, " comb. nov."
   3. **arenaria** (Jansen & Wachter) Philipson, " comb. nov." [780/2, var. g.]
   4. **calcicola** Philipson, " ecas. nov."
   Two minor variations.
   b. **palustris** Huds., *Fl. Angl.*, ed. 1, 27 (1762). [780/2.]
   One minor variation.

B. *Hybrids.*

1. **A. canina** L. × **tenuis** Sibth. Recorded from v.-cc. 12, 92, 110, H.5.
2. **A. canina** L. × **stolonifera** L. Recorded from " Cornwall, Truro," v.-c. 1 or 2.
3. **A. stolonifera** L. × **Polypogon monspeliensis** Desf. [782/2.]

C. *Aliens.*

1. **A. Muelleri** Presl, *Bot. Bemerk.*, 120 (1844) (*A. pallida* Lam. & DC.). Native of S. Europe. V.-c. 83. [780/7.]
2. **A. hiemalis** (Walt.) Britton, Sterns & Poggenb., *Prelim. Catal.*, 68 (1888). Native of N. America. V.-cc. 21, 34, 97.
3. **A. olivetorum** Gren. & Godr., *Fl. Fr.*, *3*, 483 (1856). Native of S. Europe. V.-cc. 11, 34, 41. [This species may be a hybrid between *A. canina* and *A. tenuis*.]
4. **A. semiverticillata** (Forssk.) Christens. in *Dansk. Bot. Archiv*, *4*, 12 (1922). [780/1: as to this name see Hubbard in *B.E.C. 1936 Rep.*, 415 (1937).—Ed.]
5. *A. nebulosa* Boiss. & Reut., *Diagn.*, 26 (1842). Native of S. Spain. V.-cc. 23, 83. [780/5.]
6. *A. lachnantha* Nees in *Ind. Sem. Hort. Bot. Vratisl.* (1834). Native of S. Africa. V.-c. 79. [780/10.]
7. **A. avenacea** J. F. Gmel., *Syst.*, *2*, 171 (1791). (*A. retrofracta* Willd.: *Deyeuxia Fosteri* Kunth). Native of Australia and New Zealand. V.-c. 79. [783/6.]

Philipson has seen no British specimens of *A. elegans* Thore [780/8] and *A. eriantha* Hack. [780/11].

824/11b. POA ALPINA L., var. ACUTIFOLIA Druce. This is referred by Nannfeldt (1937 A) to *P. jemtlandica* (Almqu.) Richt., and has been taken to be a hybrid between *P. alpina* L. and *P. flexuosa* Sm. (which is "*Poa laxa*, var. *scotica*" Druce). In Scandinavia its distribution (map, p. 7) is exclusively within that of *P. flexuosa*, but is very small although in Sweden, as on Lochnagar, the number of individuals exceeds those of *P. flexuosa*. A discussion of the relation of vivipary to hybridization is added and the details of distribution are added in full (including Scotland, p. 25).

PLANT RECORDS.

*=New vice-county record. †=Not native in this locality.

Note.—Where these signs are used at the beginning of a paragraph containing more than one record, they refer to the first record only.

In the case of direct contributions, the name of the contributor is printed in small capitals. In the case of records which are Abstracts, the author's name and date, or the date alone, are enclosed in brackets. In every case where no date is printed, it is to be understood that the record refers to 1937.

See also pp. 428-435 for records made on the 1937 Excursions.

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†1/2. CLEMATIS FLAMMULA L. 6, N. Somerset; rocky ground in Bourton Combe, 1936, I. Evans (Sandwith; 1937, 180).

4/1. ADONIS ANNUA L. emend. Mill. 8, S. Wilts.; in a cabbage field on Ashley Hill, two miles east of Salisbury, Gullick (1937; 82). 20, Herts.; Great Amwell, D. MCCLINTOCK.

5/1. MYOSURUS MINIMUS L. 12, N. Hants.; between Fleet and Crookham, G. A. R. WATTS.

6/5d. RANUNCULUS BULBOSUS L., var. DUNENSIS Druce. 3, S. Devon; Dawlish Warren, 1936, G. T. FRASER, det. A. J. WILMOTT.

6/20. RANUNCULUS FLUITANS Lam. 3, S. Devon; R. Otter, Otterton, G. T. FRASER.

6/22. RANUNCULUS TRICHOPHYLLUS Chaix. 37, Worcs.; Castlemorton Common, F. M. DAY, det. R. W. BUTCHER. 70, Cumberland; Thurstonfield Loch, R. W. BUTCHER.

*6/22(2). RANUNCULUS RADIANS Revel. 7, N. Wilts.; pond at Flaxlands, near Wootton Bassett, J. D. GROSE, det. R. W. BUTCHER.

6/24. RANUNCULUS HETEROPHYLLUS Weber. 3, S. Devon; ditch, Otterton Bridge, G. T. FRASER.

6/26b. RANUNCULUS PSEUDO-FLUITANS Baker & Foggitt, var. MINOR Pearsall. 57, Derby; R. Wye, Monsal Dale, Miss E. S. TODD.

6/28b. RANUNCULUS BAUDOTII Godron, var. CONFUSUS (Godron). 45, Pembroke; Lillypool, Bosherton, J. F. G. CHAPPLE, det. R. W. BUTCHER.

*6/29. RANUNCULUS TRIPARTITUS DC. 14, E. Sussex (W. Dod; 1937, 8).

6/31. RANUNCULUS LÉNORMANDI F. Schultz. 12, N. Hants.; ditch by Weaver's Down, near Liphook, E. C. WALLACE. 16, W. Kent; Hayes, D. McCLINTOCK, det. KEW.

6/33e. RANUNCULUS FICARIA L., var. BULBIFERA Marsden-Jones. 38, Warwick; shady church-yard, Stratford-on-Avon, P. M. HALL.

†6(2). **Ceratocephalus** Moench, *Meth.*, 218 (1794).

†6(2)/1. **Ceratocephalus falcatus** (L.) Pers., *Syn.*, *1*, 341 (1805). *Ranunculus falcatus* L., *Sp. Pl.*, ed. 1, 556 (1753) = 6/19 of *B.P.L.* Mediterranean Region. 6, N. Somerset; Bristol tip, J. P. M. BRENAN and Mrs C. I. SANDWITH.

9/1b. HELLEBORUS VIRIDIS L., var. OCCIDENTALIS (Reut.) Druce. 40, Salop; Bowhills Dingle, nearly a hundred plants, far from a habitation and appearing to be native: bracketed in *C.F.*, meaning, presumably, that it is not native, W. H. HARDAKER.

†9/2. HELLEBORUS FOETIDUS L. 3, S. Devon; recently introduced at Watcombe, Torquay, by Miss E. F. Foster: it grew about Torquay many years ago but has not been seen for a long time.—G. T. FRASER.

*†13/3. DELPHINIUM GAYANUM Wilmott (*D. Ajacis* Gay, non L.). 14, E. Sussex (W.-Dod; 1937, 17).

*14/1. ACONITUM ANGLICUM Stapf. 13, W. Sussex and *14, E. Sussex (W.-Dod; 1937, 17). 36, Hereford; still at Gosford Bridge, Little Hereford, where it has been known since 1819, J. E. LOUSLEY and A. H. CARTER.

17/1. BERBERIS VULGARIS L. 8, S. Wilts.; hedge near Standlynch, Gullick (1937; 82).

*†22/1. MECONOPSIS CAMBRICA (L.) Vig. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 21).

†23/3. **Glaucium grandiflorum** Boiss. & Huet., in Boiss., *Diagn.*, Ser. 2, *5*, 15 (1856). E. Mediterranean Region. 6, N. Somerset; waste land above Oldfield Park, Bath, 1936, I. Evans (Sandwith; 1937, 180).

*32/1. FUMARIA CAPREOLATA L. 13, W. Sussex (W.-Dod; 1937, 23).

32/5. FUMARIA BORAEI Jord. 52, Anglesey; Trearddur Bay, A. L. STILL. [Given for 52 in *C.F.*, though bracketed as doubtful in *Welsh Flowering Plants*.—ED.]

32/5c. FUMARIA BORAEI Jord., var. GRACILIS Pugsl. 11, S. Hants.; near Eling, Lady DAVY and J. F. G. CHAPPLE, det. H. W. PUGSLEY.

32/9b. FUMARIA BASTARDII Boreau, var. HIBERNICA Pugsl. H.12, Wexford; Rosslare village, J. E. LOUSLEY and R. C. L. BURGES, det. H. W. PUGSLEY.

33/2. MATTHIOLA SINUATA Br. Bracket 14, E. Sussex in *C.F.*: the record on which this is based is considered by W.-Dod (1937; 25) to have been a clerical error for *M. incana*.—ED.

*35/2. RORIPPA SYLVESTRIS (L.) Sm. 52, Anglesey; Trearddur Bay (B.E.C. Exc.).

†35/5. RORIPPA AUSTRIACA (Crantz) Bess. 22, Berks., established for some years in a paddock at Winterbrook Lodge, Cholsey, Lady SEVERN, det. Miss M. S. CAMPBELL as *Nasturtium austriacum* Crantz.

*†36/5. BARBAREA INTERMEDIA Boreau. 13, W. Sussex (W.-Dod; 1937, 29).

37/6. ARABIS GLABRA (L.) Bernh. 7, N. Wilts.; still exists in two places near Spye Park, Grose (1937; 87). Delete 14, E. Sussex, from *C.F.* (W.-Dod; 1937, 30).

†40/2. LUNARIA ANNUA L. 4, N. Devon; escape, E. Lyn valley, C. AMHERST.

43/3b. DRABA INCANA L., var. CONFUSA (Ehrh.) Liljebl. 88, Mid Perth, rocks in the Invervar corrie, Glen Lyon, R. MACKECHNIE and E. C. WALLACE.

*†43/4. DRABA MURALIS L. 8, S. Wilts.; appeared in 1937 in a garden at West Grimstead, near Salisbury, close to a *Spiraea* brought from Hillier's nursery, Winchester, two or three years before: cf. *B.E.C. 1936 Rep.*, 239 (1937); Gullick (1937; 82). *†12, N. Hants.; shrubbery, Longstock Park, Stockbridge, Miss BEDDINGTON.

*44/3. EROPHILA PRAECOX DC. 13, W. Sussex (W.-Dod; 1937, 35).

45/5. COCHLEARIA ANGLICA L. Add 14, E. Sussex to *C.F.*, but no record since 1798 (W.-Dod; 1937, 36). 74, Wigtown; muddy ditches by Moss of Cree, E. C. WALLACE.

*45/7. COCHLEARIA DANICA L. 14, E. Sussex (W.-Dod; 1937, 36).

†49/4. SISYMBRIUM ORIENTALE L. 3, S. Devon; Newton Abbot tip, G. T. FRASER.

†49/26. **Sisymbrium septulatum** DC., *Syst. Nat.*, *2*, 471 (1821): *Prodr.*, *1*, 193 (1824). *Sinapis Oliveriana* DC., *ll. cc.*, 609 and 218. *Sisymbrium grandiflorum* Post, *Pl. Post.*, *1*, 3 (1890). Syria, Persia, Arabia, Afghanistan, Baluchistan. 6, N. Somerset; Bristol tip, Mrs C. I. SANDWITH and J. P. M. BRENAN.

†52/1. CAMELINA SATIVA Crantz. 13, W. Sussex (W.-Dod; 1937, 40); add to *C.F.*, previous record in *J.B.*, 19 (1909).—ED.

53/1. SUBULARIA AQUATICA L. 70, Cumberland; Thurstonfield Loch, R. W. BUTCHER.

54/1. BRASSICA OLERACEA L. 14, E. Sussex (W.-Dod; 1937, 41); add to *C.F.*, recorded by L'Obel in 1655.—ED.

54/14b. BRASSICA ARVENSIS Kuntze, var. ORIENTALIS (L.) Aschers. 33, E. Gloster; Windrush, F. M. DAY.

†54/16. BRASSICA JUNCEA Coss. 6, N. Somerset; Weston, Bath, T. H. GREEN.

†54/20. BRASSICA GALLICA (Willd.) Druce. 14, E. Sussex; Newhaven, one plant only, L. A. W. BURDER. *†61, S.E. Yorks.; King George Dock, Hull, A. K. WILSON, Miss C. M. ROB and W. A. SLEDGE.

†54/22. BRASSICA ADPRESSA Boiss. 6, N. Somerset; Weston, Bath, T. H. GREEN.

55/1. DIPLOTAXIS TENUIFOLIA (L.) DC. Delete brackets from 14, E. Sussex, in *C.F.* (W.-Dod; 1937, 42-43). 61, S.E. Yorks.; Skidby chalk-pit, A. K. WILSON.

*61/2. LEPIDIUM LATIFOLIUM L. 14, E. Sussex (W.-Dod; 1937, 45). †20, Herts.; canal bank near Rickmansworth, P. H. COOKE and F. M. DAY (recorded independently).

†61/3. LEPIDIUM DRABA L. Add 14, E. Sussex, to *C.F.* (W.-Dod; 1937, 47): see *J.B.*, 11 (1906), for previous record.—ED.

*†61/4. LEPIDIUM RUDERALE L. 56, Notts; canal-side, Lenton, R. BULLEY in *B.E.C. 1936 Rep.*, 394, 1937. †61, S.E. Yorks.; Olympia Sidings, J. KENDALL.

61/5. LEPIDIUM CAMPESTRE (L.) R. Br. 33, E. Gloster; Foxcote, Miss L. ABELL.

†61/12. LEPIDIUM SATIVUM L. 46, Cardigan; near Tresaith, W. R. ROBERTS, comm. DEPT. BOT., NAT. MUS. WALES.

†61/28. LEPIDIUM BONARIENSE L. 11, S. Hants.; Wicor, near Portchester, 1934, W. A. SLEDGE, det. P. AELLEN.

*†65/1. IBERIS AMARA L. 13, W. Sussex (W.-Dod; 1937, 48).

67/1. HUTCHINSIA PETRAEA (L.) R. Br. 6, N. Somerset; near Charterhouse-on-Mendip, 1935, W. S. Parry: perhaps confirming the old record (J. C. Collins in *New Bot. Guide*, 1837) from Cheddar given in the *Bristol Flora*.—Sandwith (1937, 176).

†68/1. ISATIS TINCTORIA L. Add 13, W. Sussex, to *C.F.* (W.-Dod; 1937, 48), but see *J.B.*, 19 (1909), for previous record.—ED. *†14, E. Sussex (W.-Dod; *loc. cit.*).

†70/2. VOGELIA APICULATA (Fisch., Mey. & Avé-Lall.) Vierh. 6, N. Somerset; waste ground, Bristol, Mrs C. I. SANDWITH.

80/2. RAPHANUS MARITIMUS Sm. 41, Glamorgan; on pebble beach, Aberthaw, confirming record made by J. Storrie in 1886, Miss E. VACHELL, det. A. J. WILMOTT.

†85/6. RESEDA INODORA Reichb. 6, N. Somerset; waste land above Oldfield Park, Bath, 1936, I. Evans (Sandwith; 1937, 180).

88. VIOLA L., determined by P. M. HALL.

88/4e. VIOLA RIVINIANA Reichb., var. NEMOROSA Neum., Waldst., and Murb. 28, W. Norfolk; Beeston, near Litcham, E. S. EDEES.

88/6. VIOLA CANINA L. 108, W. Sutherland; Island of Handa, sparingly on dunes (spec. non vidi.—P.M.H.), J. W. and H. Heslop Harrison (1937; 2). [Stated in error to be N.C.R., but see *J.B.*, 169 (1916), for previous record: add to *C.F.*—ED.]

88/6h. VIOLA CANINA L., var. LUCORUM Reichb. H.2, N. Kerry; Ross Island, Killarney, J. E. LOUSLEY and R. C. L. BURGES. H.15, S.E. Galway; Garryland demesne, Gort, 1936: H.27, W. Mayo; wooded shore, S.E. corner of Lough Conn, 1936; P. M. HALL and N. D. SIMPSON.

*88/7. VIOLA LACTEA Sm. 13, W. Sussex (W.-Dod; 1937, 57). 41, Glamorgan; Ewenny Down, near Bridgend, Miss RAWLINS.

88/7×5. VIOLA LACTEA Sm. × RIVINIANA Reichb. 41, Glamorgan; Ewenny Down, near Bridgend, Miss RAWLINS.

88/8h. VIOLA ODORATA L., var. SUBCARNEA (Jord.) Parl. 23, Oxon.; wood near Cold Harbour, H. J. RIDDELSDELL. 36, Hereford; Halesend, Cradley, F. M. DAY.

88/15b. VIOLA VARIATA Jord., var. SULPHUREA Drabble. 24, Bucks.; Cop Hill, F. CARTER and J. D. GROSE.

*88/24. VIOLA SEGETALIS Jord., f. OBTUSIFOLIA (Jord.). 54, N. Lincs.; Winterton, E. S. EDEES in *B.E.C. 1936 Rep.*, 394, 1937.

88/26. VIOLA ANGLICA Drabble. 19, N. Essex; north of Great Chesterford: 26, W. Suffolk; clover field near Barton Mills, P. M. HALL and E. C. WALLACE.

*88/29. VIOLA ARVATICA Jord. 76, Renfrew; between Wemyss Bay and Gourock, Hon. W. J. L. PALMER.

88/33. VIOLA LUTEA Huds. H.20, Wicklow; sand-dunes, Brittas Bay, J. E. LOUSLEY and R. C. L. BURGES.

88/34. VIOLA LUTEA Huds., f. CURTISII (Forster) Drabble. 45, Pembroke; dunes, Freshwater Bay West, J. F. G. CHAPPLE.

89/4. POLYGALA OXYPTERA Reichb. 12, N. Hants.; turf of Nore Hill, Selborne, A. J. WILMOTT and P. M. HALL.

†92/7. DIANTHUS PLUMARIUS L. 14, E. Sussex; downs near Firle Beacon, W. E. WARREN.

†93/1. DIANTHUS PROLIFER L. Add to *C.F.* 14, E. Sussex, alien (W.-Dod; 1937, 64): see *J.B.*, 12 (1906), for previous record.—ED.

96/2b. SILENE CUCUBALUS Wibel, var. PUBESCENS DC. 3, S. Devon; Milber: Brixham; T. STEPHENSON. 85, Fife; N. Queensferry, E. C. WALLACE.

*†96/4. SILENE NOCTIFLORA L. 13, W. Sussex (W.-Dod; 1937, 67). †33, E. Gloster; Foxcote, Miss L. ABELL.

96/5. SILENE ANGLICA L. 45, Pembroke; cultivated fields, Angle, J. F. G. CHAPPLE. 46, Cardigan; Gwbert-on-Sea, W. R. ROBERTS, comm. DEPT. BOT., NAT. MUS. WALES. [Add to *C.F.*: see *Welsh Flowering Plants* for previous record.—ED.]

*†96/6. SILENE QUINQUEVULNERA L. 13, W. Sussex, and *†14, E. Sussex (W.-Dod; 1937, 66).

†96/7. SILENE GALLICA L. 16, W. Kent; Hayes, D. McCLINTOCK.

96/10. SILENE NUTANS L. 3, S. Devon; Beer, Sir M. ABBOT ANDERSON and G. T. FRASER.

*†96/11. SILENE ITALICA Pers. 13, W. Sussex, as an escape: delete 14, E. Sussex, from *C.F.*, error (W.-Dod; 1937, 67).

†96/27(2). **Silene coeli-rosa** (L.) Godr., *Obs. crit. l'infl. Silene*, 42 (1847). *Agrostemma coeli-rosa* L., *Sp. Pl.*, ed. 1, 436 (1753). W. Mediterranean Region and cult. 41, Glamorgan; Splott, Cardiff, R. L. SMITH.

100/1. MOENCHIA ERECTA (L.) G. M. & S. 8, S. Wilts.; Landford Common, Gullick (1937; 82). 43, Radnor; Llan-fillan, J. F. G. CHAPPLE and N. D. SIMPSON. 49, Caernarvon; near Llanfairfechan, F. TALFOURD JONES, comm. DEPT. BOT., NAT. MUS. WALES.

100/2. CERASTIUM ARVENSE L. 7, N. Wilts.; Okus, Swindon, Grose (1937; 87).

101/4. STELLARIA NEGLECTA Weihe. 8, S. Wilts.; Gutch Common, Semley, 1936: near Tisbury Station: lane from Ham Cross to Chilmark quarries; Gullick (1937; 82). [Add to *C.F.*: for previous record see *Top. Bot. Supp.*, i, 21 (1905).—ED.] *52, Anglesey; near Red Wharf Bay, Miss E. VACHELL.

101/6. STELLARIA PALUSTRIS Retz., var. VIRIDIS Fries. Read " 13, W. Sussex " for " 14, E. Sussex " in *C.F.* (W.-Dod; 1937, 75).

102/8. ARENARIA TENUIFOLIA L. 6, N. Somerset; in open limestone vegetation near the top of Purn Hill, Bleadon, J. E. LOUSLEY. 7, N. Wilts.; Oaksey, P. M. HALL and J. D. GROSE. 8, S. Wilts.; Salisbury, walls in Mill Road and Harcourt Terrace, Gullick (1937; 82).

†102/14. ARENARIA BALEARICA L. 3, S. Devon; wall-top, Vane Hill, Torquay, E. M. PHILLIPS.

103/1c. SAGINA NODOSA (L.) Fenzl, var. MONILIFORMIS Lange. 8, S. Wilts.; Allington Down, J. D. GROSE, det. F. R. ELLISTON WRIGHT.

103/2. SAGINA SUBULATA (Sw.) Presl. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 79): see *J.B.*, 12 (1906), for previous record.—ED. 49, Caernarvon; Llanfairfechan, F. TALFOURD JONES, comm. DEPT. BOT., NAT. MUS. WALES.

103/5. SAGINA SCOTICA Druce. 88, Mid Perth; Ben Heasgarnich, P. M. HALL and W. A. SLEDGE.

105/1. SPERGULARIA RUPICOLA Lebel. 45, Pembroke; Broadhaven Bay, J. F. G. CHAPPLE.

105/5. SPERGULARIA RUBRA (L.) Pers. 89, E. Perth; Ballinluig, R. MACKECHNIE and E. C. WALLACE.

*†108/1. CLAYTONIA ALSINOIDES Sims. 4, N. Devon; Old Rectory, Belstone, E. M. PHILLIPS.

109/2. MONTIA VERNA Neck. 43, Radnor; Llan-fillan, J. F. G. CHAPPLE and N. D. SIMPSON.

*111/2. ELATINE HEXANDRA DC. 70, Cumberland; Thurstonfield Loch (soft-neutral water), R. W. BUTCHER.

†112/3. HYPERICUM HIRCINUM L. 13, W. Sussex; banks of the Arun north of Billingshurst, far from habitation, E. C. WALLACE.

112/7. HYPERICUM MONTANUM L. 45, Pembroke; near Broadhaven, J. F. G. CHAPPLE. [Not the same form that grows on the Chilterns, which is the var. *scabrum* Koch.—J.F.G.C.]

112/12. HYPERICUM MACULATUM Crantz. 12, N. Hants.; several places about Hartley Wintney, E. C. WALLACE.

112/17. HYPERICUM ELODES L. 44, Carmarthen; drainage cut in a boggy field, Sylen, D. EVANS, comm. DEPT. BOT., NAT. MUS. WALES.

†115/2. ALTHAEA HIRSUTA L. 6, N. Somerset; waste land above Oldfield Park, Bath, 1936, I. Evans (Sandwith; 1937, 180). †41, Glamorgan; Splott, Miss RAWLINS and Miss TODD.

116/1. LAVATERA ARBOREA L. 45, Pembroke; Broadhaven Bay: Bullslaughter Bay; J. F. G. CHAPPLE. †H.28, Sligo; Rosses Point, W. H. HARDAKER. [Praeger, 1934, states that this species is not native in Co. Sligo, but does not give it as one of the plants of this locality.—ED.]

†117/9. MALVA PARVIFLORA L. 16, W. Kent; old chalkpit, Greenstreet Green, near Farnborough, J. E. LOUSLEY.

*†123/1. TILIA PLATYPHYLLOS Scop. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 90-1).

*123/3. TILIA CORDATA Mill. 13, W. Sussex (W.-Dod; 1937, 91).

*124/1. RADIOLA LINOIDES Roth. 97, W. Inverness; Invercannich, 1936, Miss M. S. CAMPBELL. 105, W. Ross; Opinan, near Gairloch, 1936, F. DRUCE with Miss M. S. CAMPBELL and A. J. WILMOTT.

†126/1. TRIBULUS TERRESTRIS L. 39, Staffs.; Burton-on-Trent, J. P. M. BRENAN and J. CHAPPLE.

*†127/1. GERANIUM SANGUINEUM L. 13, W. Sussex (W.-Dod; 1937, 93). Add 14, E. Sussex to *C.F.* (W.-Dod; *loc. cit.*) but see *J.B.*, 13 (1906), for earlier record.—ED.

†127/2. GERANIUM VERSICOLOR L. 3, S. Devon; Longbrook, near Ermington: near Hole's Hole, Bere Alston, E. M. PHILLIPS.

127/4. GERANIUM PRATENSE L. 12, N. Hants.; S. Warnborough, P. M. HALL, H. W. PUGSLEY, E. C. WALLACE and A. J. WILMOTT. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 94): see *J.B.*, 13 (1906), for earlier record.—ED.

†127/5. GERANIUM PHAEUM L. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 94): see *J.B.*, 13 (1906), for earlier record. *†14, E. Sussex (W.-Dod; *loc. cit.*).

*†127/11. GERANIUM ROTUNDIFOLIUM L. 14, E. Sussex (W.-Dod; 1937, 96).

127/12. GERANIUM PUSILLUM L. 12, N. Hants.; Hazeley Heath, G. A. R. WATTS.

128/1. ERODIUM MARITIMUM (L.) L'Hérit. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 99): see *J.B.*, 13 (1906), for earlier record. Delete brackets from 14, E. Sussex in *C.F.*: although the species is very rare, perhaps extinct, at the present time, there are herbarium specimens from one locality (W.-Dod; *loc. cit.*).

†128/2. ERODIUM MOSCHATUM (L.) L'Hérit. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 99): see *J.B.*, 13 (1906), for earlier record.—ED.

*†132/2. OXALIS CORNICULATA L. 13, W. Sussex (W.-Dod; 1937, 100).

*†132/3. OXALIS STRICTA L. 16, W. Kent; Hayes, D. MCCLINTOCK.

†132/6. OXALIS VIOLACEA L. H.1, S. Kerry; Darrynane: H.20, Wicklow; Brittas Bay; in both cases on dunes well away from houses, J. E. LOUSLEY and R. C. L. BURGES.

*†133/1. IMPATIENS NOLI-TANGERE L. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 100). †69, N. Lancs.; eastern shore of Coniston Water, many large dense clumps, Mrs R. A. L. COLE, comm. L. A. W. BURDER. †69, Westmorland; Stockghyll Force: N. Lancs.; Duddon Bridge; the whole population in both localities cleistogamous, though buds and fruits were plentiful; J. E. LOUSLEY.

†133/3. IMPATIENS PARVIFLORA DC. 58, Cheshire; Bideton Hill Woods, Birkenhead, Miss E. M. LIND. *†95, Moray; Spey Bay, mouth of R. Spey, Lady BIRCHALL.

*†133/4. IMPATIENS GLANDULIFERA Royle. 13, W. Sussex (W.-Dod; 1937, 101). Add 14, E. Sussex to *C.F.* (W.-Dod; *loc. cit.*): see *B.E.C. 1923 Rep.*, 176 (1924), for previous record.—ED. †16, W. Kent; Lewisham: Catford: Sydenham, D. MCCLINTOCK.

151/2b. ONONIS REPENS L., var. HORRIDA Lange. 3, S. Devon; cliff south of Mt. Batten R.A.F. Station, Plymouth, E. M. PHILLIPS.

152/1. TRIGONELLA ORNITHOPODIOIDES DC. 52, Anglesey; Cemlyn Bay and Trearddur Bay, A. L. STILL.

†153/1b. MEDICAGO FALCATA L., var. TENUIFOLIOLATA Vuyck. To record in *B.E.C. 1934 Rep.*, 823 (1935), add "Det. J. E. LOUSLEY."—L. A. W. BURDER.

153/4b. MEDICAGO HISPIDA Gaertn., var. DENTICULATA (Willd.) Wohlfarth. 3, S. Devon; Kingsteignton, G. T. FRASER, det. J. S. L. GILMOUR. *67, S. Northumberland; Temperley (1937 B, 52).

153/5. MEDICAGO ARABICA Huds. 7, N. Wilts; near Seend, Grose (1937; 87).

*†153/6. MEDICAGO MINIMA (L.) Bartal. 13, W. Sussex, probably only casual (W.-Dod; 1937, 109).

†153/27. MEDICAGO LACINIATA (L.) Mill. 39, Staffs; Burton-on-Trent, R. C. L. BURGES, det. P. AELLEN.

†153/35. **Medicago Nöeana** Boiss., *Diagn.*, Ser. 2, *2*, 10 (1856). Alien, Orient. 6, N. Somerset; Ashton Gate tip, Mrs C. I. SANDWITH.

†154/4. MELILOTUS INDICA (L.) All. 66, Durham; add to *C.F.*, not N.C.R.: *67, S. Northumberland; both Temperley (1937 B, 52).

155/2f. TRIFOLIUM PRATENSE L., var. LEUCOCHRACEUM Aschers. & Prantl. 41, Glamorgan; Port Talbot Burrows, Miss M. THOMAS.

*155/3. TRIFOLIUM OCHROLEUCUM Huds. 14, E. Sussex (W.-Dod; 1937, 113).

*†155/4. TRIFOLIUM INCARNATUM L. 13, W. Sussex (W.-Dod; 1937, 114).

155/8. TRIFOLIUM SQUAMOSUM L. 16, W. Kent; by canal, Higham, in full flower on the exceptionally late date, September 25th, J. E. LOUSLEY.

155/10. TRIFOLIUM SCABRUM L. 23, Oxon.; near Broughton: a very rare plant in the county; J. P. M. BRENAN, J. F. G. CHAPPLE and R. MELVILLE.

155/11. TRIFOLIUM STRIATUM L. 7, N. Wilts.; Okus, Swindon (imperilled by quarrying); Little Hinton, Grose (1937; 87).

155/11b. TRIFOLIUM STRIATUM L., var. ERECTUM Gaspar. 3, S. Devon; Seaton, Sir M. ABBOT ANDERSON and G. T. FRASER. 8, S. Wilts.; Whaddon, 1937, in good quantity but threatened by building, Miss B. GULLICK.

*155/17. TRIFOLIUM GLOMERATUM L. 13, W. Sussex (W.-Dod; 1937, 117).

†155/19. TRIFOLIUM AGRARIUM L. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 119): see *J.B.*, 14 (1906), for previous record. *†14, E. Sussex (W.-Dod; *loc. cit.*). *†16, W. Kent; old pit near Greenstreet Green, near Farnborough, J. E. LOUSLEY and H. W. MANSFIELD.

*155/22. TRIFOLIUM FILIFORME L. 74, Wigtown; Galloway, above Morroch Bay, A. J. WILMOTT.

†155/24. TRIFOLIUM PANNONICUM Jacq. 59, S. Lancs.; railway bank near Aintree, J. D. Massey (*N.W. Nat., 12*, No. 3, 307).

*160/4. LOTUS ULIGINOSUS Schkuhr. 108, W. Sutherland; Island of Handa, very rare, one or two plants only, J. W. and H. Heslop Harrison (1937; 3).

160/4b. LOTUS ULIGINOSUS Schkuhr, var. GLABER Bréb. 10, Wight; Shanklin, L. A. W. BURDER.

*†163/1. GALEGA OFFICINALIS L. 17, Surrey; naturalized on the railway bank between South Merton and South Morden, with white and mauve flowers, A. G. BROWN, comm. D. B. FANSHAWE.

*†170/1. CORONILLA VARIA L. 8, S. Wilts.; near Newton Tony, J. D. GROSE. †Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 123): see *J.B.*, 21 (1909), for previous record. *†14, E. Sussex (W.-Dod; *loc. cit.*). †44, Carmarthen; hedge near Llandefaelog, D. EVANS, comm. DEPT. BOT., NAT. MUS. WALES. [Add to *C.F.*: see *Welsh Flowering Plants* for previous record.—ED.]

†173/4. **Onobrychis squarrosa** Viv., *Fl. Aegypt. Arab. Diagn.*, 14 (1830). Alien, Eastern Mediterranean region. 6, N. Somerset; Ashton Gate tip, Mrs C. I. SANDWITH.

†174(2). **Arachis** L., *Gen. Pl.*, ed. 5, 329 (1754).

†174(2)/1. **Arachis hypogaea** L., *Sp. Pl.*, ed. 1, 741 (1753). Cult. in tropical regions, origin probably E. trop. S. America. 41, Glamorgan, rubbish heap, Penarth Road, Cardiff, Mrs SANDWITH, J. P. M. BRENAN and R. L. SMITH. [It seems strange that this is the first British record for the common Pea-nut: there were three nice plants, each in flower, but no pods were formed.—R.L.S.]

176/13i. VICIA ANGUSTIFOLIA (L.) Reichard, var. LUTESCENS Corb. 3, S. Devon; hedgebank about ½ mile from the sea, Little Dartmouth, 1936, J. F. G. CHAPPLE, det. A. J. WILMOTT. [First recorded for Britain from Cornwall and Essex by C. E. Salmon in *Trans. Linn. Soc.*, 1926. Dr G. C. Druce in *B.E.C. 1927 Rep.*, 304 (1928), gave this name to a plant gathered by him at St Osyth, Essex, in 1898. The specimen, however, which is in Herb. Druce, is *V. lutea* L.—J.F.G.C.]

†176/21. VICIA CALCARATA Desf. (*V. monanthos* Retz., non Desf.) 39, Staffs.; Burton-on-Trent, R. C. L. BURGES.

*†178/1. LATHYRUS LATIFOLIUS L. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 129).

178/2. LATHYRUS SYLVESTRIS L. 45, Pembroke; rock face, Freshwater Bay East, J. F. G. CHAPPLE.

†178/3. LATHYRUS TUBEROSUS L. Add 14, E. Sussex to *C.F.* (W.-Dod; 1937, 129): see *Science Gossip*, 224 (1888), for previous record.—ED. *†21, Middlesex; Chiswick, embankment of Thames, 1933, still there 1937, E. B. BANGERTER, det. and comm. A. J. WILMOTT. *†27, E. Norfolk; Kelling, near Holt, a little group of two or three plants growing among bracken, Mrs GOMERSAL. *†61, S.E. Yorks.; King George Dock, Hull, A. K. WILSON.

†178/7. LATHYRUS HIRSUTUS L. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 128): see *B.E.C. 1911 Rep.*, 81 (1912), for previous record.—ED.

†178/9. LATHYRUS APHACA L. 3, S. Devon; Seaton, Sir M. ABBOT ANDERSON and G. T. FRASER. †8, S. Wilts.; stubble field, Milford, first seen 1931, now firmly established on grassy bank and apparently permanent, Gullick (1937; 82).

†178/9b. LATHYRUS APHACA L., var. **floribundus** (Velen.) Hegi, *Illust. Fl. v. Mittel-Eur.*, Band iv, *3*, 1591. *L. floribundus* Velenovský, *OBZ*, *36*, 228 (1886): *Fl. Bulg.*, 156 (1891). *L. Aphaca* L., f. *floribundus* Maly, *Verh. ZBG. Wien*, *54*, 227 (1904). 34, W. Gloster; tip near Bristol, J. P. M. BRENAN and Mrs C. I. SANDWITH. [This variety differs from typical *L. Aphaca* in having all or very nearly all the inflorescences two- instead of one-flowered. The other characters brought forward by Velenovský in his description of *L. floribundus* seem quite inconstant. It was first recorded from Bulgaria; a plant recorded by Bornmüller from Trieste is probably referable to this variety; Hegi mentions it as having been found at Solothurn in Switzerland. A sheet from Macedonia in Herb. Kew collected by Capt. Harris seems to be this variety.—J. P. M. BRENAN.]

178/25b. LATHYRUS MONTANUS Bernh., var. TENUIFOLIUS Reichb. 12, N. Hants.; pasture near Blackmoor, Liss, E. C. WALLACE.

*†183/2. PRUNUS PADUS L. 13, W. Sussex (W.-Dod; 1937, 133): Add †14, E. Sussex to *C.F.* (W.-Dod; *loc. cit.*): see *J.B.*, 14 (1906), for previous record.—ED.

*†184/10. SPIRAEA SALICIFOLIA L. 4, N. Devon; hedge near Challacombe Mill, C. AMHERST. *†13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 133).

*†187/2. GEUM RIVALE L. 14, E. Sussex; probably a garden escape (W.-Dod; 1937, 156).

*187/2×1. GEUM RIVALE L. × URBANUM L. = × INTERMEDIUM Ehrh. 13, W. Sussex (W.-Dod; 1937, 156). *H.9, Clare; Ballyvaghan, W. H. HARDAKER.

*†188/1. FRAGARIA MOSCHATA Duch. 14, E. Sussex (W.-Dod; 1937, 156-7).

189/3d. POTENTILLA ANSERINA L., var. SERICEA Hayne. 3, S. Devon; marshy meadow, Cornwood, G. T. FRASER.

†189/11. POTENTILLA NORVEGICA L. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 157): see *J.B.*, 16 (1906) for previous record.—ED. *†35, Monmouth; waste ground, Redbrook, S. G. CHARLES, comm. DEPT. BOT., NAT. MUS. WALES.

189/25b. POTENTILLA PALUSTRIS (L.) Scop., forma SERICEA (Wolf) (var. *villosa* (Lehm.) Druce of *B.P.L.*). 62, N.E. Yorks; very well marked at Pilmoor, Mrs FOGGITT, Miss C. M. ROB, J. E. LOUSLEY and J. E. WOODHEAD.

*190/1. ALCHEMILLA HYBRIDA Mill. = *A. pubescens* Lam. according to various authors, e.g. Salmon. H.29, Leitrim; limestone pastures, O'Rorke's Table, Dromohaire, 1933, R. LL. PRAEGER, det. A. J. WILMOTT. (New to Ireland).

190/4. ALCHEMILLA MINOR Huds. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 160): see *J.B.*, 410 (1901), for previous record. [Under 190/1. *A. vulgaris* L. (aggregate) in *C.F.* delete 13 as one of the exceptions.—ED.] 19, N. Essex; ride in wood near Widdington, P. M. HALL.

191/2. AGRIMONIA ODORATA (Gouan) Mill. 3, S. Devon; Cornwood: 4, N. Devon; Bridestowe; W. KEBLE MARTIN and G. T. FRASER. 45, Pembroke; Orielton, J. F. G. CHAPPLE.

†193/2. POTERIUM POLYGAMUM W. & K. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 161): see *J.B.*, 16 (1906), for previous record. *†14, E. Sussex (W.-Dod; *loc. cit.*).

193/4. POTERIUM OFFICINALE (L.) A. Gray. 12, N. Hants.; sparingly in a meadow by the Blackwater, Bramshill, P. M. HALL and E. C. WALLACE.

194. ROSA L. determined by A. H. WOLLEY-DOD (except in case of 194/18f and 194/18g).

194/4e. ROSA MICRANTHA Sm., var. SEPTICOLA (Déségl.) Gren., "with slightly hispid fruit." 23, Oxon.; chalk hill, Hartslock Woods, H. J. RIDDELSDELL.

194/6g. ROSA CANINA L., var. FLEXIBILIS (Déségl.) Rouy. 23, Oxon.; chalk hill, Hartslock Woods, H. J. RIDDELSDELL.

194/6l. ROSA CANINA L., var. SPURIA (Pug.) W.-Dod. 23, Oxon.; chalk hill, Hartslock Woods, H. J. RIDDELSDELL.

*194/9. ROSA BLONDAEANA Rip. 13, W. Sussex and *14, E Sussex (W.-Dod; 1937, 167).

*194/12. Rosa Afzeliana Fr. 14, E. Sussex (W.-Dod; 1937, 168).

194/15. Rosa rubiginosa L. 22, Berks.; Woodon Hill behind Streatley, H. J. Riddelsdell.

*194/16. Rosa agrestis Savi. 13, W. Sussex (W.-Dod; 1937, 172).

*194/18. Rosa obtusifolia Desv. 14, E. Sussex (W.-Dod; 1937, 169).

194/18f. Rosa obtusifolia Desv., var. Borreri (Woods) W.-Dod. 66, Durham; Bishopley: 67, S. Northumberland; Corbridge and Falstone, J. W. Heslop Harrison (*Vasc.*, *23*, No. 4, 157, as var. of *R. tomentella* (agg.), which "seems to be much more widely spread than has been supposed.") [Add 66 and 67 to *C.F.* and see Baker and Tate, *Flora of Northumberland and Durham*, 163, 1868, for previous records.—Ed.]

194/18g. Rosa obtusifolia Desv., var. sclerophylla (Scheutz) W.-Dod. 68, Cheviotland; near Craster, J. W. Heslop Harrison (*loc. cit.*). [Add to *C.F.* and see Baker and Tate, *loc. cit.*, for previous record.—Ed.]

*194/19. Rosa tomentosa Sm. 13, W. Sussex (W.-Dod; 1937, 170).

194/19d. Rosa tomentosa Sm., var. pseudo-cuspidata (Crép.) Rouy. 22, Berks; near Streatley: 23, Oxon; near Goring; H. J. Riddelsdell.

194/19f. Rosa tomentosa Sm., var. scabriuscula Sm., "forma." 14, E. Sussex; Hindleap, H. J. Riddelsdell.

194/19h. Rosa tomentosa Sm., var. Brittoni W.-Dod, "forma." 23, Oxon.; Cane End, H. J. Riddelsdell. ["I have had this form from Kingston, Oxon (Druce): it is off-type in having eglandular leaflets, and is less coarsely serrate than the Kent and Surrey form."—A. H. W.-D.]

*194/20e. Rosa Sherardi Davies, forma pseudo-mollis (E. G. Baker) W.-Dod. 33, E. Gloster; Aston Farm, Bourton-on-the-Hill, H. J. Riddelsdell.

†195/9. Sorbus intermedia (Ehrh.) Pers. 88, Mid Perth; a single tree at edge of wood by road, Glen Lyon, P. M. Hall and E. C. Wallace.

*†195/14. Sorbus latifolia (Lam.) Pers. 58, Cheshire; small tree in wood, Newton, near Chester, C. Waterfall, *B.E.C. 1936 Rep.*, 400, 1937.

195/16. Pyrus germanica (L.) Hook. fil. Add 13, W. Sussex and 14, E. Sussex to *C.F.* (W.-Dod; 1937, 176): see *J.B.*, 17 (1906), for previous records.—Ed.

†195/17. PYRUS CYDONIA L. 41, Glamorgan; three trees in a wood, Cyn Coed, near Cardiff, L. PIERCE, comm. R. L. SMITH.

*196/2. CRATAEGUS OXYACANTHA L. 13, W. Sussex (W.-Dod; 1937, 176). Add 14, E. Sussex to *C.F.* (W.-Dod; 1937, 177): see *J.B.*, 24 (1909), for previous record.—ED.

196/2f. CRATAEGUS OXYACANTHA L., var. MICROPHYLLA Druce. 19, N. Essex; Widdington, 1936, J. E. LOUSLEY.

†197/2. COTONEASTER MICROPHYLLA Wallich. 44, Carmarthen; Mienciau, D. EVANS: 49, Caernarvon; high up on Moel Siabod, alt. 2860 ft., H. L. NORTH; both comm. DEPT. BOT., NAT. MUS. WALES.

†201/2. **Mitella caulescens** Nutt. ex Torr. & Gray, *Fl. N. Amer.*, *1*, 586 (1840). 22, Berks; Bagley Wood, D. B. FANSHAWE, det. P. AELLEN.

*†207/4. RIBES PUBESCENS Hartm. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 179).

207/5. RIBES ALPINUM L. 54, N. Lincs.; Limber Wood, near Brocklesby, 1936, Miss E. F. NOEL, det. and comm. A. J. WILMOTT.

*211/1b. SEDUM TELEPHIUM L., em. Gren. & Godr., subsp. FABARIA (Koch) Schinz & Thellung. 13, W. Sussex (W.-Dod; 1937, 181).

†211/1(2). **Sedum spurium** M. Bieb., *Fl. Taur. Cauc.*, *1*, 352 (1808). This prostrate cultivated species has now escaped in many countries (cf. Hegi, *Ill. Fl. Mitt.-Eur.*, iv, 526). I have received it from:—25, E. Suffolk; on the beach at Aldeburgh, 1929, Col. R. Meinertzhagen: 44, Carmarthenshire; flat grassy piece of ground just outside Carmarthen Town, 1919, D. Hamer in Herb. Arthur Bennett (unnamed). The third specimen in Herb. Mus. Brit.—" On garden wall. Road near Sawrey "—[69, N. Lancs., W. of Windermere] in Herb. C. A. Wright, was presumably part of the garden, and not yet even an escape.—A. J. WILMOTT.

*†211/2. SEDUM RUPESTRE L. 13, W. Sussex and 14, E. Sussex (W.-Dod; 1937, 183).

*†211/3. SEDUM REFLEXUM L. 70, Cumberland; Watermillock, A. H. CARTER, comm. J. E. LOUSLEY.

†211/7. SEDUM ALBUM L. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 182): see *J.B.*, 17 (1906), for previous record. *†14, E. Sussex (W.-Dod; *loc. cit.*). †70, Cumberland; well-established on rocks by Ullswater, Pooley Bridge, A. H. CARTER and J. E. LOUSLEY.

*†211/10. SEDUM DASYPHYLLUM L. 13, W. Sussex (W.-Dod; 1937, 181).

213/1. DROSERA ANGLICA Huds. For "13, W. Sussex" in *C.F.* substitute "14, E. Sussex, extinct." W.-Dod (1937; 184) gives no records at all for 13 and only two for 14, one of which was probably an error for *D. longifolia* L. The other was made by Sherard in 1724, since when the plant has not been seen.—ED.

213/2. DROSERA LONGIFOLIA L. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 184-5): see *J.B.*, 17 (1906), for previous record.—ED.

216/1. MYRIOPHYLLUM SPICATUM L. 70, Cumberland; Thurstonfield Loch, R. W. BUTCHER.

216/2. MYRIOPHYLLUM ALTERNIFLORUM DC. 4, N. Devon, Tawton; W. KEBLE MARTIN and G. T. FRASER.

217/1c. CALLITRICHE STAGNALIS Scop., var. PLATYCARPA (Kuetz.). 57, Derby; Dovedale, Miss E. S. TODD, det. C. E. BRITTON. [Add to *C.F.*: for previous records, including this locality, see Linton, *Flora of Derbyshire*, 150 (1903).—ED.]

*217/3. CALLITRICHE PALUSTRIS L., em. Rendle & Britt. 14, E. Sussex (W.-Dod; 1937, 187).

*217/5. CALLITRICHE INTERMEDIA Hoffm. 13, W. Sussex (W.-Dod; 1937, 188). 49, Caernarvon; Llyn Idwal, with var. *angustifolia* (Hoppe) Druce and transitional forms, J. F. G. CHAPPLE and N. D. SIMPSON.

217/5e. CALLITRICHE INTERMEDIA G. F. Hoffm., var. PEDUNCULATA (DC.) Druce. 8, S. Wilts.; Landford Common, J. D. GROSE.

218/1. PEPLIS PORTULA L. 7, N. Wilts.; Somerford Common: Flisteridge Wood; Grose (1937; 87).

*†219/2. LYTHRUM HYSSOPIFOLIA L. 14, E. Sussex (W.-Dod; 1937, 189). †39, Staffs.; Burton-on-Trent, J. P. M. BRENAN and J. CHAPPLE. †61, S.E. Yorks.; King George Dock, Hull, A. K. WILSON, Miss C. M. ROB and W. A. SLEDGE.

In *B.E.C. 1921 Rep.*, 124 (1922) and also in "The Flora of Leicestershire and Rutland" (1933), this species is incorrectly recorded as having been found by me at Husbands Bosworth, Leics. I have never seen or recorded this species from this or any other locality. The error is due to the late A. R. Horwood, to whom I showed three specimens of a *Lythrum* found growing on waste ground under trees near the stable of the then uninhabited old vicarage at Sibbertoft Coombes, Northants., in August 1920, in association with *Lappula echinata* Gilib., *Sisymbrium altissimum* L., *Thlaspi arvense* L., *Lepidium ruderale* L., *Polygonum Convolvulus* L., and other weeds. He at first glance mistook them for *L. Hyssopifolia*, but subsequently named them *L. alatum*. The specimens were later sent to Dr Druce, who deter-

mined them as *Lythrum meonanthum* Link, under which name the record was published in his "Flora of Northamptonshire," 1930, p. 294 (ascribed by a slip to E. A. Ellis).—A. E. Ellis.

†219(2). **Punica** L.

†219(2)/1. **Punica Granatum** L., *Sp. Pl.*, ed. 1, 472 (1753). (The Pomegranate). Alien. Medit. Reg. to W. Himalaya, and cult. 6, N. Somerset; a single bush 4-5 ft. high by the R. Avon, Bath, T. H. Green (Sandwith; 1936, 120).

220/5. Epilobium tetragonum L., emend. Curt. 3, S. Devon; Newton Abbot tip, Miss E. S. Todd. 61, S.E. Yorks.; King George Docks, Hull, W. A. Sledge, Miss C. M. Rob and A. K. Wilson. *64, Mid West Yorks.; Ledstone, W. A. Sledge and G. A. Nelson. Last two records both det. G. M. Ash.

220/7. Epilobium obscurum Schreb. 45, Pembroke; Orielton, J. F. G. Chapple.

220/7×5. Epilobium obscurum Schreb. × tetragonum L., emend. Curtis. 61, S.E. Yorks.; King George Docks, Hull, W. A. Sledge, Miss C. M. Rob and A. K. Wilson, det. G. M. Ash.

*†220/7(2). Epilobium adenocaulon Hausskn. 14, E. Sussex (W.-Dod; 1937, 191). 16, W. Kent; delete record in *B.E.C. 1936 Rep.*, 255 (1937). *†20, Herts; Tring, J. P. M. Brenan. *†39, Staffs; Burton-on-Trent, J. P. M. Brenan and J. Chapple.

220/7(2)×4. Epilobium adenocaulon Hausskn. × parviflorum Schreb. 34, W. Gloster; Avonmouth Docks, 1935, C. I. Sandwith (1937, 177), det. G. M. Ash.

220/7(2)×10. Epilobium adenocaulon Hausskn. × montanum L. 34, W. Gloster; Avonmouth Docks, 1935, C. I. Sandwith (1937, 177), det. G. M. Ash.

220/8. Epilobium roseum Schreb. 19, N. Essex; ditch in lane, Lexden, E. C. Wallace. 23, Oxon; Wheatley, J. F. G. Chapple.

220/9. Epilobium lanceolatum Seb. & Maur. Remove brackets from 13, W. Sussex in *C.F.* (W.-Dod; 1937, 190). *14, E. Sussex (W.-Dod; *loc. cit.*).

†220/15. Epilobium nummulariifolium R. Cunn. 59; S. Lancs.; railway cutting, Aughton, J. D. Massey (*N.W. Nat.*, *12*, No. 3, 307).

221/1. Ludvigia palustris (L.) Elliott. In addition to the locality in 14, E. Sussex, where the species is now extinct, quoted in *C.F.*, W.-Dod (1937; 193) also refers to a locality in 13, W. Sussex, where it is also extinct, if ever discovered.—Ed.

†223/1. Oenothera biennis L. Add 13, West Sussex to *C.F.* (W.-Dod; 1937, 193): see *J.B.*, 17 (1906), for earlier record. *†14, E. Sussex (W.-Dod; *loc cit.*).

*†223/2. Oenothera Lamarkiana Ser. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 194).

225/3. Circaea alpina L. 69, Westmorland; Glencoyne Dale, Ullswater, very typical, A. H. Carter and J. E. Lousley.

†239/5. **Eryngium giganteum** Bieb., *Fl. Taur. Cauc.*, *1*, 201 (1808). Caucasus. 16, W. Kent; tip at Green Street Green, J. P. M. Brenan.

245/5. Bupleurum tenuissimum L. 54, N. Lincs.; by the Witham below Boston, E. C. Wallace.

246/1. Trinia glauca (L.) Dum. 7, N. Wilts.; this was recorded in *B.E.C. 1932 Rep.*, 103 (1933), but no specimens were kept and extensive searches by the original finder and others have failed; the record must remain doubtful.—Grose (1937; 88).

†250/1. Carum Carvi L. Add 13, W. Sussex to *C.F.* (W.-Dod; 1937, 200): see *J.B.*, 18 (1906), for earlier record. *†14, E. Sussex (W.-Dod; *loc. cit.*).

250/2. Carum verticillatum Koch. 44, Carmarthen; Mynydd Sylen, D. Evans, comm. Dept. Bot., Nat. Mus. Wales.

*†250/3. Carum Petroselinum (L.) Benth. & Hook. fil. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 199-200).

*†257/1. Myrrhis Odorata Scop. 8, S. Wilts.; Sutton Mandeville, near Church, casual, Gullick (1937; 82). *†17, Surrey; well-established in a valley north of Haslemere waterworks, J. G. Lawn.

259/1. Scandix Pecten-veneris L. 66, Durham; near Birtley, J. W. Heslop Harrison (*Vasc.*, *23*, No. 3, 117).

263/1. Foeniculum vulgare Mill. Delete brackets from 14, E. Sussex in *C.F.* (W.-Dod; 1937, 205).

*265/1. Oenanthe aquatica (L.) Poir. 68, Cheviotland; Reaveley Burn and Goswick, a single plant in each case, J. E. Hull (*Vasc.*, *22*, No. 4, 157 (1936)): near Wooler, K. B. Blackburn (*Vasc.*, *23*, No. 3, 118).

*265/2. Oenanthe fluviatilis Coleman. 13, W. Sussex and *14, E. Sussex (W.-Dod; 1937, 208).

265/6. Oenanthe Lachenalii C. Gmel. 7, N. Wilts.; near Wootton Bassett, Grose (1937; 88).

276/2. PEUCEDANUM OFFICINALE L. Add to *C.F.* 13, W. Sussex, extinct (W.-Dod; 1937, 209): first record *Ray Cat.*, ed. 1, 239 (1670).

277/2b. HERACLEUM SPHONDYLIUM L., var. ANGUSTIFOLIUM Huds. 88, Mid Perth; roadside, Fortingall, E. C. WALLACE and R. MACKECHNIE.

*†279/1. CORIANDRUM SATIVUM L. 27, E. Norfolk; Norwich, 1930, L. A. W. BURDER. *†62, N.E. Yorks.; Whitby, H. BRITTEN, comm. W. A. SLEDGE.

*†283/2. CAUCALIS DAUCOIDES L. 14, E. Sussex (W.-Dod; 1937, 212).

*283/4. CAUCALIS ARVENSIS Huds. 61, S.E. Yorks.; between Cliffe and Holme-on-Spalding Moor, A. K. WILSON.

†287/2b. SAMBUCUS NIGRA L., var. LACINIATA L. 13, W. Sussex, hedgerow, Rudgwick, E. C. WALLACE.

†287/3. SAMBUCUS EBULUS L. 7, N. Wilts.; abundantly established near Sevenhampton, Grose (1937; 88). †8, S. Wilts.; near Enford, Gullick (1937; 82). †63, S.W. Yorks.; Raventhorpe, P. H. COOKE.

†289/1. SYMPHORICARPUS RACEMOSUS Michx. 44, Carmarthen; Llangendeirne, D. EVANS, comm. DEPT. BOT., NAT. MUS. WALES.

291/5. LONICERA XYLOSTEUM L. Add to *C.F.* 14, E. Sussex, status doubtful (W.-Dod; 1937, 216).

†291/7. **Lonicera japonica** Thunb., *Fl. Jap.*, 89 (1784). Sect. NINTOOA DC. Alien. Japan, Corea, China. 3, S. Devon; well established, Weir Quay, Bere Ferrers, E. M. PHILLIPS.

295/1. RUBIA PEREGRINA L. 34, W. Gloster; Kingscote, very near the boundary-line between 33 and 34, J. W. HAINES. 45, Pembroke; Broadhaven Bay, J. F. G. CHAPPLE.

296/5. GALIUM SYLVESTRE Poll. 7, N. Wilts.; the record in *B.E.C. 1933 Rep.*, 529 (1934), was an error, immature specimens of *G. hercynicum* Weig. having been misidentified.—Grose (1937; 88).

296/10. GALIUM TRICORNE Stokes. 7, N. Wilts.; Sevenhampton: Foxhill, near Liddington; Grose (1937; 88).

†296/12b. GALIUM VAILLANTII DC. For 14, E. Sussex in *C.F.* read 13, W. Sussex (W.-Dod; 1937, 220).

298/3. ASPERULA CYNANCHICA L. 45, Pembroke; Broadhaven Bay, J. F. G. CHAPPLE.

†298/5. ASPERULA ARVENSIS L. 67, S. Northumberland; waste ground near Forest Hall, M. E. Urton (*Vasc.*, *23*, No. 4, 156).

301/1. VALERIANA OFFICINALIS L. Add to *C.F.* 14, E. Sussex (W.-Dod; 1937, 223): see *J.B.*, 18 (1906), for earlier record.

†301/4. VALERIANA PYRENAICA L. 5, S. Somerset; in a wooded combe, Dulverton, C. AMHERST.

304/3. VALERIANELLA DENTATA (L.) Poll. 46, Cardigan; near Tresaith, W. R. ROBERTS, comm. DEPT. BOT., NAT. MUS. WALES.

304/4. VALERIANELLA CARINATA Loisel. 1, W. Cornwall; wall by roadside, Ruan Minor: roadside bank, Cadgwith, Mrs C. I. and N. Y. SANDWITH. 12, N. Hants; Hazeley Heath, G. A. R. WATTS. *13, W. Sussex and *14, E. Sussex (W.-Dod; 1937, 224).

*304/5. VALERIANELLA RIMOSA Bast. 13, W. Sussex (W.-Dod; 1937, 225).

306/2. DIPSACUS PILOSUS L. 7, N. Wilts.; Hodson: Whetham Woods; Grose (1937; 88). 63, S.W. Yorks.; Kirk Smeaton, W. A. SLEDGE.

†307/3. CEPHALARIA TATARICA Schrad. 3, S. Devon; railway bank, Mutley, Plymouth, E. M. PHILLIPS.

†318/20. ASTER LINOSYRIS (L.) Bernh. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 228): see *J.B.*, 26 (1909) for earlier record.

320/1. ERIGERON BOREALIS Vierh. 88, Mid Perth; north of Glen Lyon, E. C. WALLACE and R. MACKECHNIE.

†320/3. ERIGERON CANADENSIS L. 3, S. Devon; The Quay, Exmouth; F. M. DAY. †7, N. Wilts.; Sandridge, J. D. GROSE. †8, S. Wilts., since 1935 increasingly abundant on roadsides around Whaddon sandpits, near Salisbury, Gullick (1937; 82). Add to *C.F.* †13, W. Sussex and †14, E. Sussex (W.-Dod; 1937, 228): for previous records see *J.B.*, 18 (1906), and *J.B.*, 26 (1909), respectively. †20, Herts.; Hamper Mill, Rickmansworth, F. M. DAY.

†320/10b. ERIGERON MUCRONATUS DC. 22, Berks.; Abingdon, naturalized on stone retaining-wall of Thames, J. Burtt Davy (*J.B.*, *75*, 235).

326/1. ANTENNARIA DIOICA (L.) Gaertn. 33, E. Gloster; Foxcote, Miss L. ABELL.

†327/1b. ANAPHALIS MARGARITACEA C. B. Clarke, var. SUBALPINA Gray. 85, Fifeshire; North Queensferry, E. C. WALLACE. [Add to *C.F.*, but not N.C.R., see *B.E.C. 1919 Rep.*, 659 (1920).—ED.]

328/3. GNAPHALIUM SYLVATICUM L. 3, S. Devon; Wooston, Moretonhampstead, 1936, G. T. FRASER: Helton, Bridford, W. KEBLE MARTIN and G. T. FRASER.

*328/4. GNAPHALIUM NORVEGICUM Gunn. 109, Caithness; rough pasture near Ackergill, August 1927, Col. R. MEINERTZHAGEN: specimen in Herb. Meinertzhagen confirmed by A. J. WILMOTT; photo in Herb. Mus. Brit. [I have been over the ground twice, but too early in the year for success: I only observed young *G. sylvaticum* L., var. *nigrescens* Gren., but Col. Meinertzhagen had collected both species, and there is no doubt of the identification.—A.J.W.]

†333/1. INULA HELENIUM L. 8, S. Wilts.; still on roadside at Dunge, near Trowbridge, whence there is a specimen dated 1883 in the W.A.S. Herbarium at Devizes, Gullick (1937; 82). †44, Carmarthen; St Ishmaels, D. EVANS: †46, Cardigan; Cwm Duad, on the road from Newcastle Emlyn, W. R. ROBERTS; both comm. DEPT. BOT., NAT. MUS. WALES.

†339/6. **Ambrosia elatior** L. (*A. artemisiaefolia* Aschers. & Graebn., non L.) 61, S.E. Yorks.; Olympia sidings, J. KENDALL, comm. W. A. SLEDGE, det. P. AELLEN.

†341/3. XANTHIUM SPINOSUM L. 3, S. Devon; Newton Abbot tip, Wolborough, G. T. FRASER. †11, S. Hants.; waste ground, Southampton Docks, A. J. INGRAM, comm. J. E. LOUSLEY.

†350/2. VERBESINA ENCELIOIDES Benth. & Hook. 56, Notts.; Colwick, near Nottingham, R. BULLEY, det. KEW.

†351/1. GUIZOTIA ABYSSINICA Cass. 3, S. Devon; Newton Abbot tip, Miss E. S. TODD. †23, Oxon.; waste ground, Oxford, J. P. M. BRENAN and J. F. G. CHAPPLE.

353/1. BIDENS CERNUA L. 66, Durham; Cocken Woods, J. W. Heslop Harrison (*Vasc.*, *23*, No. 3, 117).

†356/1. HEMIZONIA PUNGENS Torrey & Gray. 8, S. Wilts.; abundant on waste ground near Fisherton Recreation Ground, Salisbury, 1935, Gullick (1937; 83).

367/1. DIOTIS MARITIMA (L.) Cass. Delete record in *C.F.* for 13, W. Sussex (W.-Dod; 1937, 162).

368/2. ANTHEMIS NOBILIS L. 5, S. Somerset; Holmcote, C. AMHERST.

†370/13b. CHRYSANTHEMUM PARTHENIUM (L.) Bernh., forma **hortense** (Schur) Beck. 16, W. Kent; old chalk-pit, Greenstreet Green, near Farnborough: this is the plant frequently cultivated in cottage gardens and entered in *B.P.L.* as var. *flosculosum* DC. in black type: whereas the typical form of the species may be justifiably claimed as native in a few districts, the variety is almost certainly always an outcast from cultivation.—J. E. LOUSLEY.

371/1c. MATRICARIA INODORA L., var. SALINA Bab. 4, N. Devon; Braunton Marshes, C. AMHERST.

378/1. ARTEMISIA ABSINTHIUM L. 7, N. Wilts.; Draycot, J. D. GROSE.

*†380/3. PETASITES FRAGRANS Presl. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 241).

*†381/1. DORONICUM PARDALIANCHES L. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 242).

*†381/2. DORONICUM PLANTAGINEUM L. 13, W. Sussex (W.-Dod; 1937, 242).

383/6c. SENECIO ERUCIFOLIUS L., var. SUBINTEGRIFOLIUS Druce. 3, S. Devon; Littleham, G. T. FRASER.

†383/7. SENECIO SQUALIDUS L. 54, N. Lincs.; slag-heaps, Scunthorpe, 1936, Miss J. Gibbons (Dallman; 1937 A, 61).

†383/8. SENECIO VISCOSUS L. 8, S. Wilts.; Salisbury Station, casual, Gullick (1937; 82). *13, W. Sussex (W.-Dod; 1937, 242).

383/10e. SENECIO VULGARIS L., var. RADIATUS Koch. 3, S. Devon; Plympton St Mary, E. M. PHILLIPS. 40, Salop; Wem and Whitchurch, P. H. COOKE.

†383/31. SENECIO CINERARIA DC. 3, S. Devon; Plymouth: a recent addition to the flora of the Hoe, where it is establishing itself in the crevices of limestone walls, having spread from nearby flower-beds.—E. M. PHILLIPS. †Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 245): see *B.E.C. 1921 Rep.*, 385 (1922), for previous record. *†14, E. Sussex (W.-Dod; *loc. cit.*).

†395/3. CARDUUS PYCNOCEPHALUS L. 3, S. Devon; still in good quantity on Plymouth Hoe itself, on the slope below the Citadel and elsewhere, E. M. Phillips (*J.B.*, *75*, 267).

395/3b. CARDUUS TENUIFLORUS Curtis. 7, N. Wilts.; spreading from its original station on Tan Hill: it now grows also on the southern slope of the hill and in the Wansdyke to the north-west.—Grose (1937; 88, as *C. pycnocephalus* L., var. *tenuiflorus*).

396/4×6. CIRSIUM ACAULE (L.) Weber × C. TUBEROSUM (L.) All. 7, N. Wilts.; Avebury: though apparently first recorded only in 1924, the hybrid is now as plentiful as pure *C. tuberosum*.—Grose (1937; 88).

†396/13. NOTOBASIS SYRIACA (L.) Cass. 6, N. Somerset; waste ground, Bristol, Mrs C. I. and N. Y. SANDWITH. †39, Staffs.; Burton-on-Trent, J. P. M. BRENAN and J. CHAPPLE.

397/1. ONOPORDON ACANTHIUM L. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 252): see *J.B.*, 19 (1906), for earlier record. 16, W. Kent; Hayes, D. MCCLINTOCK.

399/1. SILYBUM MARIANUM Gaertn. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 252): see *J.B.*, 20 (1906), for earlier record. *14, E. Sussex (W.-Dod; *loc. cit.*).

405/7. CENTAUREA PRATENSIS Thuill. 22, Berks.; Wellington College, Miss E. S. TODD, det. C. E. BRITTON.

405/11f. CENTAUREA NEMORALIS Jord., var. DEBEAUXII C. E. Britton. 22, Berks.; near Crowthorne, Miss E. S. TODD, det. C. E. BRITTON.

†405/26. CENTAUREA ORIENTALIS L. 41, Glamorgan; Cardiff Docks, Mrs C. I. SANDWITH, J. P. M. BRENAN and R. L. SMITH.

†405/31. CENTAUREA SOLSTITIALIS L. 16, W. Kent; West Wickham, D. MCCLINTOCK.

†405/35b. CENTAUREA PALLESCENS Delile, var. HYALOLEPIS Boiss. 39, Staffs.; Burton-on-Trent, J. P. M. BRENAN and J. CHAPPLE.

†405/43. CENTAUREA DILUTA Ait. 62, N.E. Yorks.; Whitby, H. BRITTEN, comm. W. A. SLEDGE.

†406(2). **Tetramorphaea** DC. in Guill., *Arch. Bot.*, *2*, 331 (1833).
†406(2)/1. **Tetramorphaea Belangeriana** DC., *Prodr.*, *6*, 609 (1837). Alien, Persia. 41, Glamorgan, Splott, Miss E. S. TODD, det. MUS. BRIT.

†407/3. CARTHAMUS TINCTORIUS L. 67, S. Northumberland; waste ground near Forest Hall, M. E. Urton (*Vasc.*, *23*, No. 4, 157).

†409/1. CICHORIUM INTYBUS L. 8, S. Wilts.; now a scarce plant in the v.-c., but there are persistent and increasing colonies near Salisbury Station and in Wood Road, Durrington, Gullick (1937; 82).

*410/1. ARNOSERIS MINIMA (L.) Schw. & K. 13, W. Sussex (W.-Dod; 1937, 259).

*†419/8. HIERACIUM BRUNNEO-CROCEUM Pugsl. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 268). †61, S.E. Yorks.; Hessle, T. STAINFORTH, comm. W. A. SLEDGE: near Howden Station, A. K. WILSON. *†63, S.W. Yorks.; Worsborough Reservoir, near Barnsley, E. G. Bayford, comm. A. A. Dallman (*N.W. Nat.*, *12*, No. 4, 407). *†75, Ayr; Largs: †99, Dumbarton: between Kilpatrick and Bowling (add to *C.F.* but not N.C.R.): *†100, Clyde Islands; Bute; all G. W. Phillips (*NW. Nat.*, *12*, No. 3, 306).

*419/77. HIERACIUM BRITANNICUM F. J. Hanb. H.29, Leitrim; rocks at Scriff Bay, Lough Gill, J. E. LOUSLEY and R. C. L. BURGES, det. H. W. PUGSLEY.

419/89. HIERACIUM LEPISTOIDES K. Johanns., var. SUBLEPISTOIDES Zahn. 12, N. Hants.; bank of lane near Selborne, P. M. HALL and A. J. WILMOTT, det. H. W. PUGSLEY.

419/120b. HIERACIUM EUPREPES F. J. Hanb., var. GLABRATUM Linton. 88, Mid Perth; rocky bank of Allt-na-Coire Pheiginn, a tributary of the Keltney Burn, P. M. HALL, det. H. W. PUGSLEY.

419/207. HIERACIUM TRIDENTATUM Fr. 61, S.E. Yorks.; Willerby, A. K. WILSON, det. KEW.

422/3. THRINCIA LEYSSERI Wallr. (*T. hirta* Roth.) 4, N. Devon; Lynton, C. AMHERST.

423/34. TARAXACUM SPECTABILE Dahlst. H.27, Sligo; Ben Bulben, J. E. LOUSLEY.

†425/1. LACTUCA VIROSA L. 3, S. Devon; Newton Abbot tip, Wolborough, A. CRAWSHAW and T. STEPHENSON. †7, N. Wilts.; Draycot, casual, J. D. GROSE.

*425/2. LACTUCA SERRIOLA L. 13, W. Sussex and *14, E. Sussex (W.-Dod; 1937, 271): there is a previous record in *J.B.*, 23 (1896), for "13 or 14."—ED. 14, E. Sussex; Newhaven: in view of the determination of var. *dubia* (Jord.) by Mr Lousley in *B.E.C. 1936 Rep.*, 265 (1936), various forms both in flower and fruit were sent to him from three distinct areas at Newhaven, all of which he named "*L. Scariola* L."; areas A and B are half a mile apart and area C is about a mile from both; there has been considerable increase in both quantity and distribution of the plant in the last two or three years, area C this year producing a dense clump, 5 ft. × 3 ft. and 5 ft. in height.—L. A. W. BURDER. 15, E. Kent; Shellness, Sheppey, an interesting shingle form with deeply cut leaves, J. E. LOUSLEY. *†19, N. Essex; Hythe Quay, Colchester, G. C. BROWN, *B.E.C. 1936 Rep.*, 405 (1937). *†67, S. Northumberland; waste ground near Forest Hall, M. E. Urton (*Vasc.*, *23*, No. 4, 156).

†425/8. LACTUCA MACROPHYLLA (Willd.) A. Gray. 34, W. Gloster; garden outcast, near Bristol, in a lane leading from Sea Walls to the Avon, 1936, I. Evans (Sandwith; 1937, 180).

432/1b. JASIONE MONTANA L., var. MAJOR Mert. & Koch. 3, S. Devon; Bigbury, G. T. FRASER. [Mr Fraser informs me that the records under this name in *B.E.C. 1936 Rep.*, 266 (1937), were erroneous, *teste* H. W. PUGSLEY: the Manaton plant was a very robust specimen of the typical form and the Thurlestone plant was var. *latifolia* Pugsl.—ED.]

432/1c. JASIONE MONTANA L., var. LATIFOLIA Pugsl. 3, S. Devon; Burgh Island, Bigbury, G. T. FRASER. H.3, W. Cork; Baltimore, J. E. LOUSLEY and R. C. L. BURGES.

*†435/2. CAMPANULA LATIFOLIA L. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 278).

†435/4. CAMPANULA RAPUNCULOIDES L. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 279): see *J.B.*, 47 (1906), for previous record. †16, W. Kent; Wilmington: found by Mrs M. le F. Shepherd, who states that it is a troublesome weed in gardens throughout the village; the record is of considerable interest as there are many old records for *C. Rapunculus* L. in the district.—J. E. LOUSLEY. *†29, Cambs.; roadside verge near Royston, E. C. WALLACE. †41, Glamorgan; Merthyr Mawr, Miss RAWLINS. [Only one previous doubtful record for this species in Glamorgan: remove brackets in *Glamorgan Flowering Plants* and in *C.F.*—E. VACHELL.]

*†435/6. CAMPANULA PERSICIFOLIA L. 14, E. Sussex (W.-Dod; 1937, 280).

*†435/7. CAMPANULA RAPUNCULUS L. 13, W. Sussex (W.-Dod; 1937, 280).

*†435/8. CAMPANULA PATULA L. 14, E. Sussex (W.-Dod; 1937, 280).

438/2. VACCINIUM MYRTILLUS L. 8, S. Wilts.; Semley Hill, Gullick (1937; 83).

439/1d. OXYCOCCUS QUADRIPETALUS Gilib., var. MACULATUS Lousl. 68, Cheviotland; Belford Moor, 1936 (ratio of speckled fruits to red about 6: 1): Coldmartin Moss, few fruits seen all speckled; J. E. Hull (*Vasc., 23*, No. 4, 154). The only form observed by G. W. Temperley (*Vasc., loc. cit.*) in Northumberland and Durham is this var. H.20, Wicklow; Broomfield, near foot of Djouce Mountain, O. WHITE, comm. J. E. LOUSLEY.

†439/2. OXYCOCCUS MACROCARPUS Pursh. 3, S. Devon; known for many years on rocks in a road-cutting near the Southern Railway Station, Tavistock, Mr MONK, comm. G. T. FRASER. In *B.E.C. 1936 Rep.*, 266 (1937), read " Findlay " for " Melville."—ED.

441/1. ARCTOSTAPHYLOS UVA-URSI (L.) Spreng. 96, Easterness; at 3000 ft. above Fasnakyle Cannich, Mrs J. V. PHELPS.

444/1. ANDROMEDA POLIFOLIA L. 74, Wigtownshire; Mark of Luce Moss, Kirkcowan: Moss of Cree; E. C. WALLACE.

445/1b. CALLUNA VULGARIS (L.) Hull, var. INCANA Reichb. 3, S. Devon; Ilsington and Heytor Down, G. T. FRASER and F. M. DAY. 24, Bucks.;

Littlemere Common, near Burnham Beeches, very plentiful: this is a dry sandy common, like the Devon stations for this variety: Chudleigh Knighton Heathfield, the Devon station where it is commonest, is generally much drier than Dartmoor, where it is nowhere well developed or common, though fairly widely distributed, only on drier patches: probably the hairiness is an adaptation to dry situations.—F. M. DAY.

*†446/7. ERICA VAGANS L. 14, E. Sussex (W.-Dod; 1937, 282).

*†449/1. DABEOCIA CANTABRICA K. Koch. 13, W. Sussex, naturalized (W.-Dod; 1937, 282).

*453/2. PYROLA MEDIA Sw. 14, E. Sussex (W.-Dod; 1937, 283).

*457/5. LIMONIUM BINERVOSUM (G. E. Sm.) C. E. Salmon. 13, W. Sussex (W.-Dod; 1937, 285). 15, E. Kent; Shellness, Sheppey, J. E. LOUSLEY.

*†462/1. CYCLAMEN HEDERAEFOLIUM Ait. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 287-8).

463/2c. LYSIMACHIA VULGARIS L., var. KLINGGRAEFII Abromeit (= forma *maculata* Druce in *B.E.C. 1918 Rep.*, 290 (1919), cf. *J.B.*, 333 (1932), and *B.E.C. 1932 Rep.*, 43 (1933).—ED.) 11, S. Hants.; margin of Sowley Pond with the typical form of the species, Lady DAVY and J. E. LOUSLEY.

†463/7. LYSIMACHIA TERRESTRIS (L.) B. S. P. (*L. stricta* Ait.). 69, N. Lancs.; by River Leven, Low Wood: this species has been known since 1885 from the shore of Windermere near the Ferry Hotel (see *Rep. Wats. B.E.C. for 1911-12*, 347 (1913) and specimen in Herb. Kew), which station is about 10 miles by water from the present one: it seems probable that roots have been water-borne from the old locality, and search should be made for further colonies on the intervening river and lake-side.—J. E. LOUSLEY.

467/2b. ANAGALLIS ARVENSIS L., var. CARNEA Schrank. H.3, W. Cork; Toormore, J. E. LOUSLEY and R. C. L. BURGES.

467/3. ANAGALLIS FOEMINA Mill. 3, S. Devon; Kingskerswell, G. T. FRASER, det. F. E. WEISS and E. M. MARSDEN-JONES.

468/1. CENTUNCULUS MINIMUS L. 3, S. Devon; Loddiswell, W. KEBLE MARTIN and G. T. FRASER. 8, S. Wilts.; Alderbury Common in small quantity: Copse Corner, Whiteparish.—Gullick (1937; 83). *105, W. Ross; Badachro and Opinan, near Gairloch, 1936, Miss M. S. CAMPBELL, with F. DRUCE and A. J. WILMOTT.

469/1. SAMOLUS VALERANDI L. 7, N. Wilts.; near Wootton Bassett: Tockenham: Inglesham; near Oaksey: Chittoe.—Grose (1937; 88).

473/2. VINCA MINOR L. 63, S.W. Yorks.; Brocodale Woods, Wentvale, W. A. SLEDGE.

*476/1. MICROCALA FILIFORMIS Hoffm. & Link. 14, E. Sussex (W.-Dod.; 1937, 293). [This species appears to be extinct in both divisions of Sussex: the latest record for W. Sussex is 1866 and for E. Sussex 1843.—ED.]

478/1b. CENTAURIUM UMBELLATUM Gilib., var. SUBCAPITATUM (Corb.) Gilmour. 1, W. Cornwall; dunes near Gear Gate, Perranporth, 1936, J. E. LOUSLEY, det. J. S. L. GILMOUR.

478/1d. CENTAURIUM UMBELLATUM Gilib., var. FASCICULARE (Duby) Gilmour. 1, West Cornwall; cliffs, Gunwalloe, 1936: 4, N. Devon; Braunton Burrows, 1934: 9, Dorset; cliffs near Portland Bill, 1932; J. E. LOUSLEY, det. J. S. L. GILMOUR.

478/2. CENTAURIUM LITTORALE (Turner) Gilmour. Bracket record in *C.F.* for 14, E. Sussex, error (W.-Dod; 1937, 295).

478/2b. CENTAURIUM LITTORALE (Turn.) Gilmour, near var. OCCIDENTALE (Wheld. & Salm.) Gilmour. 11, S. Hants.; Sinah Common, Hayling Island, 1936, a single specimen only, thought in the field to be possibly of hybrid origin, J. E. LOUSLEY, det. J. S. L. GILMOUR.

478/4. CENTAURIUM PULCHELLUM (Swartz) Druce. 3, S. Devon; wet ground, Dawlish Warren: the plants seen covered the range from var. *palustre* (Gaud.) Druce (=var. *Swartziana* of Butcher & Strudwick, *Further Illustr. Brit. Pl.*, t. 248, Z) to var. *ramosissimum* (Gaud.) Gilmour.—G. T. FRASER. 8, S. Wilts.; grass track in Clarendon Wood, Gullick (1937; 83). 13, W. Sussex; grassy rides in St Leonard's Forest, E. C. WALLACE.

*478/5. CENTAURIUM TENUIFLORUM (Hoffmg. & Link) Fritsch. 9, Dorset; coast, 1935, R. GOOD: 1937, A. W. GRAVESON (independently). [In the winter of 1935-6 Mr Good sent me a small sheet of dried material, which I determined as above. Further material gathered by myself in 1936 was sent to the British Museum and Kew, where the determination was confirmed by Mr A. J. Wilmott and Mr J. S. L. Gilmour respectively. "9, Dorset" is actually given in *C.F.*, but Mr Chapple tells me that this was an error, the specimen on which it was based being *C. pulchellum* (Sw.) Druce. I think that there is no doubt that this is the first record for the mainland of England. In contrast to the Isle of Wight plant, which is all pink-flowered, the Dorset plant is almost all white-flowered, which Mr Wilmott tells me was the case where he saw it in S. Spain.—P. M. HALL.]

478/7. CENTAURIUM CAPITATUM (Willd. ex Cham.) Britten & Rendle. 3, S. Devon; Berry Head, 1934, J. E. LOUSLEY, det. J. S. L. GILMOUR. *13, W. Sussex (W.-Dod; 1937, 295).

480/4. GENTIANA AMARELLA L. 45, Pembroke; near Penally, J. F. G. CHAPPLE, det. H. W. PUGSLEY as *G. axillaris* F. W. Schmidt, "a curious form, flowering very early (July 31st)."

480/6. GENTIANA ANGLICA Pugsl. 8, S. Wilts.; Camp Down, N.W. of Salisbury, in fair quantity: on the Bake, S. of Wylye; Gullick (1937; 83). Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 298, as *G. lingulata* Agardh.; var. *praecox* Towns.): see *J.B.*, 48 (1906), for previous record. *14, E. Sussex (W.-Dod; *loc. cit.*).

480/9. GENTIANA CAMPESTRIS L. 7, N. Wilts.; Bedwyn Common, J. D. GROSE, det. H. W. PUGSLEY.

*480/9b. GENTIANA BALTICA Murb. 7, N. Wilts.; Bedwyn Common, J. D. GROSE, det. H. W. PUGSLEY. In *C.F.* the distribution figures for this species and *G. campestris* L. are combined. 13, W. Sussex, should be added for the aggregate: W.-Dod (1937; 298) records several W. Sussex stations under *G. campestris* but the opinion is expressed that all Sussex records are likely to be for *G. baltica*.—ED.

*†482/1. NYMPHOIDES PELTATUM (L.) Rendle & Britt. 13, W. Sussex (W.-Dod; 1937, 300).

*†486/1. POLEMONIUM CAERULEUM L. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 300-1).

†490/2. OMPHALODES VERNA Moench. 3, S. Devon; near Crab's Park, Paignton, F. M. DAY.

†492/3. **Plagiobothrys procumbens** (Colla) A. Gray in *Proc. Amer. Acad., 20*, 283 (1885). *Myosotis procumbens* Colla in *Mem. Acc. Torin, 38*, 130 (1835). Alien, Chile. 6, N. Somerset; waste ground, Bristol, MRS C. I. SANDWITH and J. P. M. BRENAN, det. J. P. M. BRENAN at Kew.

†497/2. SYMPHYTUM TUBEROSUM L. 3, S. Devon; Bere Ferrers, casual, G. T. FRASER: Kingskerswell, casual, 1936, T. STEPHENSON.

*†497/4. SYMPHYTUM PEREGRINUM Ledeb. H.28, Sligo; Drumcliff, abundant, J. E. LOUSLEY and R. C. L. BURGES.

*†500/1. ANCHUSA SEMPERVIRENS L. 13, W. Sussex (W.-Dod; 1937, 303). *†H.12, Wexford; Gorey, naturalized in quantity by roadside, J. E. LOUSLEY and R. C. L. BURGES.

†503/1. PULMONARIA OFFICINALIS L. 11, S. Hants.; edge of wood near N. Baddesley, MRS A. WHITE, comm. P. M. HALL. *†13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 305).

*†503/2. PULMONARIA LONGIFOLIA Boreau. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 305).

*506/7. MYOSOTIS SYLVATICA (Ehrh.) Hoffm. 13, W. Sussex (W.-Dod); 1937, 307). 23, Oxon.; wood near Nuneham Courtenay, J. P. M. BRENAN.

†506/7b. MYOSOTIS SYLVATICA (Ehrh.) Hoffm., var. **lactea** Boenn., *Prodromus Florae Monasteriensis*, 56, 1824. A white-flowered form. 23, Oxon.; waste ground, Port Meadow, Oxford, J. F. G. CHAPPLE, det. A. E. WADE.

506/9b. MYOSOTIS COLLINA Hoffm., var. MITTENII Baker. 16, W. Kent; Charleton, 1840, Miss E. METCALFE. 17, Surrey; Ham, 1899: Esher Common, 1929; J. FRASER. 55, Rutland; S. Luffenham, 1932, M. E. EDMONDS. H.21, Dublin; Howth, 1888, J. E. GAMBLE. Channel Islands; Sark, hollow of Eperquerie cliffs, 1929, F. BALLARD and E. A. GOLBY. [All in Herb. Kew; det. A. E. WADE.]

*†507/2. LITHOSPERMUM PURPUREO-CAERULEUM L. 14, E. Sussex (W.-Dod; 1937, 308).

†509/2. ECHIUM PLANTAGINEUM L. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 310): see *J.B.*, 275 (1920), for previous record.

†513/2(2). **Convolvulus stachydifolius** Choisy in DC., *Prodr.*, *9*, 408, (1845). Alien, Orient. Allied to *C. althaeoides* L. but easily distinguished by the short sepals and the very different indumentum of the stem and inflorescence, which is composed of much shorter deflexed hairs. 6, N. Somerset; waste ground, Bristol, Mrs C. I. SANDWITH and J. P. M. BRENAN.

†517/16. SOLANUM CILIATUM Lam. 41, Glamorgan; rubbish heap, Porthcawl, R. L. SMITH and F. NORTON.

†518/7. PHYSALIS PERUVIANA L. 41, Glamorgan; rubbish heap, Penarth Road, Cardiff, R. L. SMITH.

†522/1. DATURA STRAMONIUM L. 8, S. Wilts.; Petersfinger, Salisbury, Gullick (1937; 83). †16, W. Kent; Hayes, D. MCCLINTOCK.

†527/1. VERBASCUM PHLOMOIDES L. 12, N. Hants; Hazeley Heath, several plants near refuse dump, G. A. R. WATTS.

*†527/4. VERBASCUM VIRGATUM Stokes. 13, W. Sussex (W.-Dod; 1937, 318).

*†527/5. VERBASCUM BLATTARIA L. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 318).

*†527/6. VERBASCUM PULVERULENTUM Vill. 35, Monmouth; roadside, Upper Redbrook, S. G. CHARLES, comm. DEPT. BOT., NAT. MUS. WALES. 41, Glamorgan; Neath River, Miss M. Thomas.

527/7. VERBASCUM LYCHNITIS L. Bracket record in *C.F.* for 14, E. Sussex, error (W.-Dod; 1937, 317).

532/3. LINARIA REPENS (L.) Mill. 3, S. Devon; Heltor, Bridford, W. KEBLE MARTIN and G. T. FRASER. [Recorded from this locality by C. H. Laycock, *c.* 1930, but not published.—G.T.F.] *7, N. Wilts.; Callow Hill, J. D. GROSE. *14, E. Sussex (W.-Dod; 1937, 319).

532/3×1. LINARIA REPENS (L.) Mill. × VULGARIS Mill. 3, S. Devon; Heltor, Bridford, first Devon record for the hybrid, W. KEBLE MARTIN and G. T. FRASER. 34, W. Gloster; disused railway bank, Hallen, 1936, Miss M. Bowen (Sandwith; 1937, 178).

532/7. LINARIA MINOR (L.) Desf. 8, S. Wilts.; abundant on chalk spoil-heaps, lime-kilns on Harnham Hill, Salisbury, Gullick (1937; 83).

532/24. LINARIA SPURIA (L.) Mill. 41, Glamorgan; among shingle, Swanbridge, A. E. Wade, comm. DEPT. BOT., NAT. MUS. WALES.

†532/26b. LINARIA CYMBALARIA (L.) Mill., sub-var. PALLIDIOR Rouy. H.5, E. Cork; abundant on walls on E. side of Cork town, J. E. LOUSLEY and R. C. L. BURGES.

534/2. ANTIRRHINUM ORONTIUM L. 45, Pembroke; abundant in cultivated fields at Angle and St Ann's Head, J. F. G. CHAPPLE. 46, Cardigan; near Tresaith, W. R. ROBERTS: *†47, Montgomery; Llanfechain, 1879, R. M. SERJEANTSON; both comm. DEPT. BOT., NAT. MUS. WALES.

*535/3. SCROPHULARIA NEESII Wirtg. 13, W. Sussex (W.-Dod; 1937, 322, as *S. umbrosa* Dum.). 36, Hereford; still at Gosford Bridge, Little Hereford, whence there are early records, J. E. LOUSLEY.

†537/1. MIMULUS GUTTATUS DC. 8, S. Wilts.; among water-cress, Coombe Bisset, H. J. GODDARD. †17, Surrey; by a stream, Cosford Vale, Thursley, with *M. moschatus* Dougl., E. C. WALLACE.

541/1b. DIGITALIS PURPUREA L., var. NUDICAULIS Saunders. 49, Caernarvon; Half-way Station, Snowdon, J. F. G. CHAPPLE and N. D. SIMPSON.

†542/1. ERINUS ALPINUS L. H.9, Clare; walls between Ballyvaghan and Blackhead, W. H. HARDAKER.

543/6. VERONICA SCUTELLATA L. 7, N. Wilts.; Coate Water: Minety: near Wooton Bassett.—Grose (1937; 88).

543/8. VERONICA ANAGALLIS-AQUATICA L. 34, W. Gloster; ditch between Rangeworthy and Yate Lower Common, 1936, C. and N. Sandwith (1937; 178).

*543/9d. VERONICA AQUATICA Benquerel, var. GLANDULIFERA Čelak. 3, S. Devon; Forde Bog, Newton Abbot, W. KEBLE MARTIN and G. T. FRASER. *7, N. Wilts.; near Hannington Bridge, J. D. GROSE. Both det. C. E. BRITTON.

543/18b. VERONICA TOURNEFORTII Gmel., var. CORRENSIANA (Gmel.) Hayek & Hegi. 33, E. Gloster; Fairford, Lady DAVY, det. C. E. BRITTON.

543/18d. VERONICA TOURNEFORTII Gmel., var. ASCHERSONIANA (Lehm.) Hayek & Hegi. 23, Oxon.; Barton, J. F. G. CHAPPLE, det. C. E. BRITTON.

543/20c. VERONICA POLITA Fries, var. THELLUNGIANA (Lehm.) Hayek & Hegi. 23, Oxon.; wall, Mapledurham, a hairy form, H. J. RIDDELSDELL, det. C. E. BRITTON, as *V. didyma* Ten., var. *Thellungiana* Lehm.

†543/24. VERONICA PSEUDOCHAMAEDRYS Jacq. 75, Ayr; sand-dunes far from any habitation, near Prestwick, J. R. LEE.

†543/41. VERONICA FILIFORMIS Sm. H.28, Sligo; grassy bank between Sligo and Ben Bulben, W. H. HARDAKER.

545. EUPHRASIA L. determined by H. W. PUGSLEY.

*545/3. EUPHRASIA BREVIPILA Burnat & Gremli. H.9, Clare; near Blackhead, J. E. LOUSLEY and R. C. L. BURGES.

545/3b. EUPHRASIA BREVIPILA Burnat & Gremli, forma SUBEGLANDULOSA Bucknall. 43, Radnor; Stanner Rocks, J. F. G. CHAPPLE and N. D. SIMPSON.

545/5d. EUPHRASIA NEMOROSA (Pers.) Löhr, var. COLLINA Pugsl. 45, Pembroke; cliffs, Angle, J. F. G. CHAPPLE.

545/9b. EUPHRASIA CURTA Fries ex Wettst., var. GLABRESCENS Wettst. 45, Pembroke; sand-dunes, Freshwater Bay West, J. F. G. CHAPPLE.

*545/10b. EUPHRASIA OCCIDENTALIS Wettst., var. PRAECOX Buckn. H.12, Wexford; near Lady Island Lake, J. E. LOUSLEY and R. C. L. BURGES.

545/10d. EUPHRASIA OCCIDENTALIS Wettst., var. CALVESCENS Pugsl. 45, Pembroke; Bullslaughter Bay, J. F. G. CHAPPLE. *H.16, W. Galway; Dogs Bay, Roundstone (" cf. this var."), J. E. LOUSLEY and R. C. L. BURGES.

545/12b. EUPHRASIA FRIGIDA Pugsl., var. LAXA Pugsl. 88, Mid Perth; a luxuriant form among rushes and Marsh Orchids in a marsh on the left bank of the Allt-na-Coire Pheiginn, a tributary of the Keltney Burn, P. M. HALL and W. A. SLEDGE.

545/15. EUPHRASIA MICRANTHA Reichb. 45, Pembroke; cliffs near St David's, J. F. G. CHAPPLE. 64, Mid-West Yorks.; limestone rocks above Gordale Scar: 69, Westmorland; in limestone crevices, Hutton Roof Crag; both unusual habitats for this species, J. E. LOUSLEY.

545/18. EUPHRASIA CONFUSA Pugsl. 7, N. Wilts.; Whitefield Hill: 8, S. Wilts.; Park Hill, Longleat; J. D. GROSE.

545/18. EUPHRASIA CONFUSA Pugsl., forma ALBIDA Pugsl. 65, N.-W. Yorks.; Mirgill Hearne Brocks, Cotherstone Fell at 1400 ft., J. E. LOUSLEY and J. E. WOODHEAD.

*545/19. EUPHRASIA ROSTKOVIANA Hayne. H.28, Sligo; shore of Lough Gill near Slish Wood, J. E. LOUSLEY and R. C. L. BURGES.

545/19c. EUPHRASIA ROSTKOVIANA Hayne, var. OBSCURA Pugsl. 49, Caernarvon; Llanberis Marsh, J. F. G. CHAPPLE and N. D. SIMPSON.

546/4. BARTSIA VISCOSA L. 45, Pembroke; near Bryn Henllan, W. R. ROBERTS, comm. DEPT. BOT., NAT. MUS. WALES.

548/5. RHINANTHUS STENOPHYLLUS Schur. 7, N. Wilts.; near Ham, Grose (1937; 88). Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 334): see *Top. Bot. Supp.*, *2*, 45 (1929), for previous record. *14, E. Sussex (W.-Dod; *loc. cit.*).

†549/2(2). **Melampyrum barbatum** W. & K., subsp. **barbatum** (W. & K.) Hayek, forma **albicans** (Borbas). 18, S. Essex; waste ground, Dagenham: corolla rich golden-yellow, bracts nearly white, slightly tinged with green: Central and E. Europe; Mrs C. I. and N. Y. SANDWITH.

549/3d. MELAMPYRUM PRATENSE L., var. ERICETORUM D. Oliver. 8, S. Wilts.; Hamptworth, J. D. GROSE, det. C. E. BRITTON.

549/3g. MELAMPYRUM PRATENSE L., var. VULGATUM (Pers.) Beck, sub-var. DIGITATUM (Schur) Beauv. 8, S. Wilts.; Whiteparish Common, J. D. GROSE. 37, Worcs.; Rough Hill Wood, Cowleigh, F. M. DAY and W. W. BOUCHER, det. C. E. BRITTON.

*550/4. OROBANCHE ELATIOR Sutton. 13, W. Sussex (W.-Dod; 1937, 336).

550/7. OROBANCHE HEDERAE Duby. 8, S. Wilts.; by Burcombe Church, Gullick (1937; 83).

550/9. OROBANCHE AMETHYSTEA Thuill. Bracket record in *C.F.* for 14, E. Sussex, doubtful (W.-Dod; 1937, 337).

550/10. OROBANCHE MINOR Sm. 36, Hereford; Chance's Pitch, Colwall, parasitic on *Trifolium dubium* Sibth., F. M. DAY and T. SANGER. 64, Mid-West Yorks.; Shipley, M. SMITH, comm. W. A. SLEDGE.

551/1. LATHRAEA SQUAMARIA L. 33, E. Gloster; Guiting Wood, J. N. MILLS. 40, Salop; Bowhills Dingle, W. H. HARDAKER.

552/2. UTRICULARIA MAJOR Schmidel. 3, S. Devon; Kingsteignton, A. CRAWSHAW, comm. G. T. FRASER, det. P. M. HALL. Add to *C.F.* 14, E. Sussex (W.-Dod; 1937, 338-9): See *Top. Bot. Supp.*, *1*, 67 (1905), and *J.B.*, 48 (1906), for previous records. 27, E. Norfolk; Wheatfen Broad, Surlingham, E. A. ELLIS, det. P. M. HALL. [Add to *C.F.*, but not N.C.R., see *Top. Bot. Supp.*, *1*.—ED.]

553/1×2. ×PINGUICULA SCULLYI Druce. H.1, S. Kerry; near Faha; Brandon Mountain; Connor Hill Pass: H.3, W. Cork; near Barony Bridge, Glengariff; J. E. LOUSLEY and R. C. L. BURGES.

*553/2. PINGUICULA VULGARIS L. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 339), but place in brackets as doubtful: in one locality (Amberley—a well-frequented spot) the record is dated *c.* 1845, another is marked with a "?" and in the third (Henfield Common) the species was planted by Borrer.—ED.

553/4. PINGUICULA LUSITANICA L. 8, S. Wilts.; Landford Common, J. D. GROSE. 45, Pembroke; Trerhos Bog, Hayscastle, E. C. HOWELLS, comm. DEPT. BOT., NAT. MUS. WALES.

67(2). **Pedaliaceae** Lindl., *Nat. Syst.*, ed. 2, 281 (1836).

†553(2). **Martynia** L., *Gen. Pl.*, ed. 5, 270 (1754).

†553(2)/1. **Martynia Louisiana** Mill., *Gard. Dict.*, ed. 8, No. 3 (1768). (*M. proboscidea* Geor.). A native of the Minnesota valley, called "Unicorn plant" or "Elephant's Trunk" on account of its trunk-like fruit. 39, Staffs.; Messrs Peach & Co.'s maltings, Burton-on-Trent, R. C. L. BURGES, det. P. AELLEN.

†554/1. ACANTHUS MOLLIS L. 3, S. Devon; cliff at Kingswear, garden escape, E. M. PHILLIPS.

558. MENTHA L. determined by A. L. STILL.

558/1. MENTHA ROTUNDIFOLIA L. 11, S. Hants.; near Lovedean, P. M. HALL.

558/1c. MENTHA ROTUNDIFOLIA (L.) Huds., var. ELONGATA Pér. 45, Pembroke; near Manorbier Castle, J. D. GROSE.

558/1×4. ×MENTHA CORDIFOLIA (Opiz) Fraser. 3, S. Devon; potteries by Heathfield Station, F. M. DAY and G. T. FRASER.

558/2. MENTHA ALOPECUROIDES Hull. Add to *C.F.* 14, E. Sussex (W.-Dod; 1937, 341): see *J.B.*, 49 (1906), for previous record.

558/3. MENTHA LONGIFOLIA (L.) Huds. 34, W. Gloster; Leadington, near Dymock: 37, Worcs.; Barnard's Green, Malvern, F. M. DAY.

558/3 var. MENTHA LONGIFOLIA (L.) Huds., var. VILLOSA Huds. 33, E. Gloster; Little Barrington, F. M. DAY.

*†558/4. MENTHA SPICATA L., em. Huds. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 341). 23, Oxon.; waste ground, Oxford, J. P. M. BRENAN and J. F. G. CHAPPLE. *†33, E. Gloster; Eastington: †36, Hereford; Evendine, Colwall, F. M. DAY.

†558/6a. ×MENTHA PIPERITA L., var. OFFICINALIS Sole. 34, W. Gloster; Bromsberrow, F. M. DAY.

†558/6d. ×MENTHA PIPERITA L., var. SUBCORDATA Fraser. 33, E. Gloster; Compton Abdale: Little Barrington: Fosse Bridge, Chedworth, F. M. DAY. 41, Glamorgan; Coity Green, Llangennith, Gower (lusus *pilosus*, the hairy form, rare in the wild state), A. L. STILL.

*†558/6f. MENTHA PIPERITA L., var. SYLVESTRIS Sole [=558/8. ×M. HIRCINA (Hull)]. 14, E. Sussex; near Danehill, A. L. STILL, *B.E.C. 1936 Rep.*, 409 (1937).

558/7×3. ×MENTHA PALUSTRIS Sole. 9, Dorset; East Fleet, Miss D. MEGGISON, comm. Miss C. M. ROB.

558/9. ×MENTHA VERTICILLATA L. 45, Pembroke; Orielton: Broadhaven, J. F. G. CHAPPLE.

558/9e. ×MENTHA VERTICILLATA L., var. OVALIFOLIA (Opiz) Briq. 34, W. Gloster; Bromsberrow, F. M. DAY.

558/9q. ×MENTHA VERTICILLATA L., var. RIVALIS Briq. 11, S. Hants.; Buckler's Hard, Lady DAVY and J. F. G. CHAPPLE.

558/10. ×MENTHA GENTILIS L. 3, S. Devon; Compton, Marldon: Chudleigh Knighton; F. M. DAY: "both plants unusual, having slightly hairy pedicels and calyces."—A. L. S. 3, S. Devon; Bonehill Down, Widecombe, G. T. FRASER, F. M. DAY and T. STEPHENSON (not det. A.L.S.). *13, W. Sussex and *14, E. Sussex (W.-Dod; 1937, 344). †23, Oxon.; waste ground, Oxford, J. P. M. BRENAN and J. F. G. CHAPPLE.

558/10j. ×MENTHA GENTILIS L., var. VESANA Lej. & Court. 23, Oxon.; roadside near Goring, H. J. RIDDELSDELL.

†558/11. ×MENTHA CARDIACA Baker. 23, Oxon.; waste ground, Oxford, J. P. M. BRENAN and J. F. G. CHAPPLE.

*558/12. MENTHA RUBRA Sm. 13, W. Sussex (W.-Dod; 1937, 343).

558/12d. ×MENTHA RUBRA Sm., var. RARIPILA Briq. 36, Hereford; Wellington Heath, F. M. DAY.

558/13e. MENTHA AQUATICA L., var. AUSTRIACA (Jacq.) Briq. 11, S. Hants.; Hatchett's Pond, Lady DAVY and J. F. G. CHAPPLE.

558/13×1. MENTHA MUELLERIANA F. Schultz, var. SERRATIFOLIA Pugsl. 3, S. Devon; in view of the danger to which this plant is exposed in its original station at Salcombe, cultivated material has been planted at Scabbacombe Bay by Mr G. T. Fraser [and produced ten good flowering spikes in September.—G.T.F.].—A. L. Still (*J.B.*, *75*, 23).

558/14b. MENTHA PULEGIUM L., var. ERECTA Martyn. 11, S. Hants.; Forest View, near Lyndhurst, Lady DAVY and J. F. G. CHAPPLE.

559/1. LYCOPUS EUROPAEUS L. 68, Cheviotland; on the Bowmont Water at its junction with the College burn, J. E. Hull (*Vasc.*, *23*, No. 3, 118).

*561/1. THYMUS PULEGIOIDES L. 7, N. Wilts.; Conkwell, Grose (1937; 88).

561/5. THYMUS SERPYLLUM L., var. PYCNOTRICHUS (Uechtr.) Ronn. 3, S. Devon; Dawlish Warren, 1936, G. T. FRASER, det. K. RONNIGER.

561/10. THYMUS NEGLECTUS Ronn. 3, S. Devon; Dawlish Warren, 1936, G. T. FRASER, det. K. RONNIGER. 34, W. Gloster; Bromsberrow: *37, Worcs.; Old Hills, Powick; F. M. DAY, det. KEW.

561/11. THYMUS BRITANNICUS Ronn. 3, S. Devon; Dawlish Warren, 1936: Churston Ferrers, 1936; G. T. FRASER, det. K. RONNIGER. [From comparison with the specimens identified by Dr Ronniger I believe this to be a common S. Devon form: I have noted it from Brixham, Kingskerswell, Torquay, Torbryan, Ipplepen, Stokenham and South Brent, all in v.-c. 3. Dr Ronniger also determined *T. britannicus* × *T. Chamaedrys*, from Dawlish Warren, 1936, but I have so far failed to find *T. Chamaedrys* there.—G.T.F.] *13, W. Sussex (W.-Dod; 1937, 347).

*562/7. CALAMINTHA NEPETA (L.) Savi. 13, W. Sussex and *14, E. Sussex (W.-Dod; 1937, 348).

562/8. CALAMINTHA ACINOS (L.) Clairv. 4, N. Devon; quarries, South Tawton: Bridestowe; W. KEBLE MARTIN and G. T. FRASER.

†565/1. MELISSA OFFICINALIS L. Add to *C.F.* 14, E. Sussex (W.-Dod; 1937, 349), see *J.B.*, 416 (1901), for previous record.

566/1. SALVIA PRATENSIS L. 8, S. Wilts.; several large clumps on the downs near West Lavington, Gullick (1937; 83). [Add to *C.F.*; for previous record see *B.E.C. 1925 Rep.*, 890 (1926).—ED.] †16, W. Kent; in a very rough field near Greenstreet Green about a mile from the locality recorded in *B.E.C. 1936 Rep.*, 274 (1937), J. E. LOUSLEY and H. W. MANSFIELD.

†566/12. SALVIA SYLVESTRIS L. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES, det. P. AELLEN as ×*S. elata* Host = *S. pratensis* L. × *sylvestris* L. [According to Hegi *S. elata* Host is synonymous with *S. sylvestris* L., which = *S. nemorosa* L. × *pratensis* L. See note on this hybrid in *B.E.C. 1932 Rep.*, 349 (1933).—N. Y. SANDWITH.]

569/1. NEPETA CATARIA L. 7, N. Wilts.; near Biddestone, Grose (1937; 88).

†570/3. DRACOCEPHALUM PARVIFLORUM Nutt. 56, Notts.; bank of Lenton Canal, R. BULLEY, det. KEW.

572/2. SCUTELLARIA MINOR Huds. 97, Westerness; seashore at Arisaig, 1936, with *Anagallis tenella* Murr.: see record for Invermoidart in same v.-c., *J.B.*, 1903, 274, where it is said to be very scarce in Scotland; E. C. WALLACE.

*†573/2. PRUNELLA LACINIATA L. 12, N. Hants.; near Shipton Bellinger, J. D. GROSE, P. M. HALL and E. C. WALLACE. [In *B.E.C. 1935 Rep.*, 38 (1936), this locality was incorrectly recorded as in 8, S. Wilts: the locality is very close to the county boundary and the plant was not seen on the Wiltshire side: distributed from this locality, see p. 664.—ED.] †Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 352): see *J.B.*, 91 (1909), for previous record. †20, Herts.; near Berkhamsted, meadow on chalky soil, 1936, slightly increased in 1937, Miss M. HOARE, comm. A. J. WILMOTT.

†579/1. LEONURUS CARDIACA L. 45, Pembroke; roadside, Herbrandston, J. F. G. CHAPPLE.

†581/2. LAMIUM MACULATUM L. 4, N. Devon; Okehampton Castle, E. M. PHILLIPS.

581/4b. LAMIUM HYBRIDUM Vill., var. DECIPIENS Rouy. 23, Oxon.; waste ground, Marston, J. F. G. CHAPPLE, det. C. E. BRITTON.

581/4c. LAMIUM HYBRIDUM Vill., var. DISSECTUM Mutel. 23, Oxon.; waste ground, Marston, J. F. G. CHAPPLE, det. C. E. BRITTON.

†581/7. LAMIUM GARGANICUM L. 69, Westmorland; outside an abandoned farm near Haweswater, Mrs PEMBERTON-PIGOTT, det. J. F. G. CHAPPLE and A. J. WILMOTT.

588/3e. PLANTAGO CORONOPUS L., var. PYGMAEA Lange. 3, S. Devon; Berry Head, Brixham, G. T. FRASER.

588/10b. PLANTAGO MAJOR L., var. INTERMEDIA (Gilib.) Syme. 15, E. Kent; by pool on Denge Beach, 1936, J. E. LOUSLEY and E. C. WALLACE.

589/1. LITTORELLA UNIFLORA (L.) Aschers. 63, S.W. Yorks.; near Penistone, P. H. COOKE. 70, Cumberland; Thurstonfield Loch, R. W. BUTCHER.

†596/6. AMARANTHUS RETROFLEXUS L. 26, W. Suffolk; plentiful in carrot-field, Risby, J. E. LOUSLEY.

†596/9. AMARANTHUS ALBUS L. 26, W. Suffolk; plentiful in carrot-field, Risby, J. E. LOUSLEY.

†596/12. AMARANTHUS DEFLEXUS L. 3, S. Devon; Bee Sands, Stokenham, G. T. FRASER, det. KEW.

600/1. CHENOPODIUM RUBRUM L. 8, S. Wilts.; farmyard, Boyton: manure-heap, Alderbury: farmyard, Britford, abundant; not given for the Salisbury district by Preston, *Flora of Wilts.*—Gullick (1937; 83).

600/3. CHENOPODIUM BONUS-HENRICUS L. 43, Radnor; New Radnor, J. F. G. CHAPPLE and N. D. SIMPSON.

*600/4. CHENOPODIUM HYBRIDUM L. 14, E. Sussex (W.-Dod; 1937, 369). †19, N. Essex; laneside near Colchester, E. C. WALLACE.

†600/6. CHENOPODIUM MURALE L. 3, S. Devon; The Quay, Exmouth, F. M. DAY. *†8, S. Wilts.; abundant among potatoes at Salisbury, 1933, and at Steeple Langford, 1935, but it has not persisted; according to Preston, *Flora of Wilts.*, this species required verification for the county.—Gullick (1937; 83). *†26, W. Suffolk; near Risby, J. E. LOUSLEY.

*†600/7. CHENOPODIUM OPULIFOLIUM Schrad. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 368). †17, Surrey; Collier's Wood, Tooting, J. E. WOODHEAD, det. and comm. J. E. LOUSLEY, confirmed by P. AELLEN. †19, N. Essex; Electric Power Station, Colchester, 28th August 1927, G. C. BROWN [Ref. No. 2149, distributed as "*C. album* L., var."]; specimen in Herb. Lousley determined by P. AELLEN.

*†600/12. CHENOPODIUM FICIFOLIUM Sm. 3, S. Devon; Newton Abbot tip, Wolborough, G. T. FRASER. †14, E. Sussex; arable field, Groombridge, E. C. WALLACE. †16, W. Kent; Greenstreet Green, near Farnborough, J. E. LOUSLEY. *†54, N. Lincs.; potato field near Frieston, E. C. WALLACE.

*600/13. CHENOPODIUM GLAUCUM L. 14, E. Sussex (W.-Dod; 1937, 370).

600/15. CHENOPODIUM POLYSPERMUM L. 7, N. Wilts.; Christian Malford: Devizes.—Grose (1937; 88).

†600/21. CHENOPODIUM HIRCINUM Schrad. 41, Glamorgan; Splott, Cardiff, R. L. SMITH and F. NORTON.

†600/24. CHENOPODIUM BERLANDIERI Moq., subsp. ZSCHACKEI (Murr.) Zobel, var. TYPICUM Aell. 17, Surrey, gravel-pit behind Dowding's Castle, Tadworth, 1929, J. E. LOUSLEY, det. P. AELLEN.

†606/3e. ATRIPLEX PATULA L., var. BRACTEATA Westerl. 23, Oxon.; waste ground, Oxford, J. P. M. BRENAN and J. F. G. CHAPPLE, det. A. J. WILMOTT.

†606/10. ATRIPLEX HORTENSIS L. 3, S. Devon; Chagford, G. T. FRASER and N. A. HAYWOOD, det. A. J. WILMOTT.

606/17. ATRIPLEX PORTULACOIDES L. 45, Pembroke; Broadhaven Bay, J. F. G. CHAPPLE.

†607/1. AXYRIS AMARANTOIDES L. 6, N. Somerset; allotment near Weston-super-Mare Station, 1936, Sandwith (1937; 179).

*611/7. SALICORNIA GRACILLIMA (Towns.) Moss. 41, Glamorgan; Aberthaw, Miss E. VACHELL, det. A. J. WILMOTT.

612/1. SUAEDA FRUTICOSA (L.) Forsk. Bracket 13, W. Sussex in *C.F.* and delete 14, E. Sussex (W.-Dod; 1937, 378, 560): there are no records cited for E. Sussex and the W. Sussex records are errors except in one case where the species appears to have been planted.—ED.

613/1. SALSOLA KALI L. 45, Pembroke; Broadhaven Bay, J. F. G. CHAPPLE.

*615/1. POLYGONUM DUMETORUM L. 13, W. Sussex (W.-Dod; 1937, 379).

615/3. POLYGONUM BISTORTA L. 3, S. Devon; Totnes, E. M. PHILLIPS: Dartington, G. T. FRASER. 8, S. Wilts.; water-meadow between West Harnham and Salisbury, Gullick (1937; 83). Add to *C.F.* 13, W. Sussex and 14, E. Sussex (W.-Dod; 1937, 383): for previous records see *J.B.*, 92 (1909), and *J.B.*, 51 (1906), respectively.—ED. 69, N. Lancs.; Coniston and Coniston Water, Mrs R. A. L. COLE, comm. L. A. W. BURDER.

615/4. POLYGONUM VIVIPARUM L. Delete 67, S. Northumberland, from *C.F.*, Temperley (1937 A, 12).

615/7c. POLYGONUM PERSICARIA L., var. RUDERALE Meisn. 7, N. Wilts.; Swindon, J. D. GROSE.

615/7h. POLYGONUM PERSICARIA L., var. PROSTRATUM Bréb. 3, S. Devon; Slapton, G. T. FRASER, det. C. E. BRITTON.

615/8. POLYGONUM NODOSUM Pers. 3, S. Devon; Exminster, G. T. FRASER, det. C. E. BRITTON.

*615/10. POLYGONUM MITE Schrank. 14, E. Sussex (W.-Dod; 1937, 382).

*615/11. POLYGONUM MINUS Huds. 13, W. Sussex (W.-Dod; 1937, 381-2).

615/12. POLYGONUM MARITIMUM L. For 14, E. Sussex in *C.F.* read 13, W. Sussex, and retain brackets as doubtful (W.-Dod; 1937, 381).

†615/32. POLYGONUM CUSPIDATUM Sieb. & Zucc. 14, E. Sussex; Newhaven, well established and in some quantity, L. A. W. BURDER, det. KEW.

†615/33. POLYGONUM SACHALINENSE Schmidt. 3, S. Devon; Plymouth Hoe, E. M. PHILLIPS.

†615/34. POLYGONUM COMPACTUM Hook. f. 41, Glamorgan; waste ground, Cathays Park, Cardiff, established for over ten years, A. E. WADE, R. L. SMITH and Miss E. VACHELL, comm. DEPT. BOT., NAT. MUS. WALES.

†616/2. FAGOPYRUM TATARICUM (L.) Gaertn. 3, S. Devon; waste ground, Wolborough, G. T. FRASER.

*618/1. RUMEX HYDROLAPATHUM L. 67, S. Northumberland; bog south of Cambo: Rothley Lake; R. B. Cooke and J. W. Heslop Harrison (*Vasc.*, *23*, No. 4, 158). [Mr. G. W. Temperley tells me that he has known this species at Rothley Lake since 1904, but I cannot find that a previous record has been published.—ED.]

618/2. RUMEX LONGIFOLIUS DC. Delete 68, Cheviotland, from *C.F.*, Temperley (1937 A, 10).

618/2×6. RUMEX LONGIFOLIUS DC. × OBTUSIFOLIUS L. (not necessarily ×*R. Arnottii* Druce). 88, Mid Perth; Fortingall, R. MACKECHNIE and E. C. WALLACE.

†618/5. RUMEX ALPINUS L. 70, Cumberland; still at the old localities, Ulcat Row, Mottesdale and Mossdike Farm, Mungrisdale, J. E. LOUSLEY.

618/6×11. RUMEX OBTUSIFOLIUS L. × PULCHER L. 34, W. Gloster; Alney Island with both parents, J. E. LOUSLEY.

618/9×13. RUMEX CONGLOMERATUS Murr. × MARITIMUS L. =× R. KNAFII Celak. 34, W. Gloster; pond, Hill, with both parents, 1936, E. Nelmes (Sandwith; 1937, 178).

618/10. RUMEX RUPESTRIS Le Gall. Delete 13, W. Sussex in *C.F.* and add *14, E. Sussex in brackets as doubtful (W.-Dod; 1937, 385).

*618/12. RUMEX PALUSTRIS Sm. 66, Durham; Billingham Marshes, J. W. Heslop Harrison (*Vasc.*, *23*, No. 3, 117).

618/13. RUMEX MARITIMUS L. 17, Surrey; near Godstone, D. B. FANSHAWE. 37, Worcs.; Westwood Great Pool, near Droitwich, J. E. LOUSLEY and R. C. L. BURGES.

†618/22. RUMEX DENTATUS (L.) Campd. 61, S.E. Yorks.; King George Dock, Hull, A. K. WILSON, Miss C. M. ROB and W. A. SLEDGE.

*†622/1. ARISTOLOCHIA CLEMATITIS L. 41, Glamorgan; Newton, Porthcawl, Mr BRYANT, comm. Miss E. VACHELL: Barry Dock, Mrs C. I. SANDWITH.

623/1. DAPHNE LAUREOLA L. 49, Caernarvon; near Llanfairfechan: 50, Denbigh; S. of Glan Conway; F. TALFOURD JONES, comm. DEPT. BOT., NAT. MUS. WALES.

*†625/1. HIPPOPHAE RHAMNOIDES L. 13, W. Sussex (W.-Dod; 1937, 392). *†49, Caernarvon; a thicket of it on the coast E. of Aber, F. TALFOURD JONES, comm. DEPT. BOT., NAT. MUS. WALES.

628/4. EUPHORBIA PILOSA L. Delete from *C.F.* "planted in 14": this note refers to *E. coralloides* L. (*E. pilosa* Hook. non L.), which occurs as an alien in W. and E. Sussex (W.-Dod; 1937, 395).

*†628/6. EUPHORBIA STRICTA L. 13, W. Sussex, garden escape, and 14, E. Sussex, error (W.-Dod; 1937, 395).

628/8. EUPHORBIA AMYGDALOIDES L. Read 67, S. Northumberland for 68, Cheviotland, in *C.F.*, Temperley (1937 A, 10).

†628/10. EUPHORBIA ESULA L. Add to *C.F.* 13, W. Sussex, and 14, E. Sussex (W.-Dod; 1937, 397): for previous records see *J.B.*, 51 (1906), but it is likely that there has been confusion with forms of *E. virgata* Waldst. & Kit.—ED.

†628/11. EUPHORBIA CYPARISSIAS L. 8, S. Wilts.; Larkhill Ranges, Gullick (1937; 83). †Add to *C.F.* 14, E. Sussex (W.-Dod; 1937, 397): see *J.B.*, 93 (1909), for previous record. *†63, S.W. Yorks.; Rockley, near Falthwaite, E. G. Bayford, comm. A. A. Dallman (*N.W. Nat.*, *12*, No. 4, 407).

*628/12. EUPHORBIA PARALIAS L. 14, E. Sussex (W.-Dod; 1937, 397).

628/16. EUPHORBIA LATHYRIS L. L. 8, S. Wilts.; very abundant (2 or 3 acres of fine plants) and appearing native in a newly coppiced part of Clarendon Wood, where it was "very plentiful" in 1867 (*Wilts. A.M.*, *12*, 346 (1870)), Gullick (1937; 83). [Add to *C.F.*—ED.] †Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 398): see *J.B.*, 93 (1909), for previous record. *†14, E. Sussex (W.-Dod; *loc. cit.*).

*†631/1. BUXUS SEMPERVIRENS L. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 399).

†632/2. MERCURIALIS ANNUA L. 3, S. Devon; Newton Abbot tip, Wolborough, A. CRAWSHAW and T. STEPHENSON. 7, N. Wilts.; Wroughton: Swindon: Inglesham: Seagry: Colerne: abundant in Highworth; apparently an increasing species.—Grose (1937; 88).

633/2. ULMUS NITENS Moench. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 400): see *B.E.C. 1916 Rep.*, 512 (1917), for previous record. *14, E. Sussex (W.-Dod; 1937, 401).

†635/1. CANNABIS SATIVA L. 3, S. Devon; Newton Abbot tip, Wolborough, G. T. FRASER.

637/1e. URTICA DIOICA L., var. HORRIDA Rouy. 2, E. Cornwall; cliffs, Polperro, Miss E. S. TODD.

641/1. MYRICA GALE L. 8, S. Wilts.; a few bushes just inside the county boundary, Plaitford; bracketed as doubtful in Preston, *Flora of Wilts.* [but given in *C.F.*—ED.], Gullick, (1937; 83).

†641/2. **Myrica caroliniensis** Mill. 12, N. Hants.; marshy wood between Fleet and Crookham, G. A. R. WATTS; det. A. J. WILMOTT, who says that this is the same plant as that from S. Hants recorded as *M. cerifera* L. in *B.E.C. 1936 Rep.*, 278 (1937), and is sometimes considered to be a variety of *M. cerifera*.

*642/2. BETULA PUBESCENS Ehrh. 14, E. Sussex (W.-Dod; 1937, 404).

†643/2. ALNUS INCANA Medik. 62, N.E. Yorks.; Beckhole, near Goathland, H. BRITTEN, comm. W. A. SLEDGE.

645/1b. CORYLUS AVELLANA L., var. LACINIATA Petz. & Kirch. 36, Hereford; Mitcheldean Road, The Lea, H. M. HALLETT, comm. DEPT. BOT., NAT. MUS. WALES.

*†647/1. CASTANEA SATIVA Mill. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 407).

650/3×2. SALIX ALBA L. × FRAGILIS L. =× S. VIRIDIS Fr., *sens. lat.*, ♀. 34, W. Gloster; streamside below Ashley Hill, 1936, C. Sandwith, confirmed by Dr B. Floderus. Certain trees with male catkins, many of which are curiously forked, occurring in several localities in 6, N. Somerset (Keynsham: Pensford: Brent Knoll: Berrow) are apparently to be referred to the forma *monstrosa* of the male condition of this hybrid.—Sandwith; 1937, 178.

650/9×8. SALIX AURITA L. × CAPREA L. 7, N. Wilts.; Coped Hall: Minety.—Grose (1937; 88).

*†651/1. POPULUS CANESCENS Sm. Alderney; Val du Sud, 1933, Jackson, Jackson, and Airy-Shaw (1937 A, 299).

†651/4×3. POPULUS ITALICA Moench × NIGRA L. 6, N. Somerset; between Keynsham and Saltford, trees bearing female catkins and with the branches slightly more spreading than those of the Lombardy Poplar, 1936, C. Sandwith and J. P. M. Brenan (Sandwith; 1937, 179).

†651/11. **Populus trichocarpa** Torr. & Gray ex Hook., *Ic. Pl.*, t. 878 (1852). California. 32, Northants; roadside, Silverstone, J. F. G. CHAPPLE and R. MELVILLE.

652/1. EMPETRUM NIGRUM L. 4, N. Devon; Okement Hill, Lydford, W. KEBLE MARTIN and G. T. FRASER. [Confirmation of an old record: the locality, in which the plant is confined to a limited area at 1800-1850 feet, is on the Artillery Range: shell-bursts often cause fires but we noticed that this species was one of the first to restart growth on the burnt patches.—G.T.F.]

*653/1. CERATOPHYLLUM SUBMERSUM L. 14, E. Sussex (W.-Dod; 1937, 419).

654/1. HYDROCHARIS MORSUS-RANAE L. Add to *C.F.* 67, S. Northumberland, extinct, Temperley (1937 A, 12).

†656/1. ELODEA CANADENSIS Michx. 3, S. Devon; ditches at Otterton Bridge and Totnes, G. T. FRASER. †70, Cumberland; Thurstonfield Loch, R. W. BUTCHER.

668/1. EPIPACTIS PALUSTRIS (Mill.) Crantz. 7, N. Wilts.; Tockenham, 1932; the meadow has since been drained and the plant seems to have disappeared.—Grose (1937; 88).

668/3. EPIPACTIS LEPTOCHILA Godfery. 3, S. Devon; Dunsford, E. CAHEN, comm. G. T. FRASER, det. T. STEPHENSON. *13, W. Sussex (W.-Dod; 1937, 424). Bracket 14, E. Sussex, recorded in *B.E.C. 1933 Rep.*, 543 (1934), doubtful (W.-Dod; *loc. cit.*).

*668/4. EPIPACTIS PURPURATA Sm. 13, W. Sussex (W.-Dod; 1937, 424).

668/5. EPIPACTIS ATROPURPUREA Rafn. Delete from *C.F.* 13, W. Sussex: there is no reference in W.-Dod (1937) to any Sussex record of this species.—ED.

669/1. ORCHIS PURPUREA Huds. Delete brackets in *C.F.* from 13, W. Sussex and 14, E. Sussex (W.-Dod; 1937, 427).

669/7. ORCHIS LATIFOLIA L. 3, S. Devon; Heathfield, Bovey Tracey, A. CRAWSHAW and T. STEPHENSON. Add to *C.F.* 13, W. Sussex (W.-

Dod; 1937, 430, as *O. incarnata* L.): see Arnold, *Fl. Sussex* (1887), for previous record. H.3, W. Cork; S. of Baltimore; H.16, W. Galway, near Recess (a purple-flowered form): H.20, Wicklow; near Newcastle Station, J. E. Lousley and R. C. L. Burges, det. P. M. Hall. H.15, S.E. Galway; Raford, near Athenry: H.27, W. Mayo; Lough Conn, Mrs Gough, det. and comm. P. M. Hall.

669/7c. Orchis latifolia L., var. pulchella (Druce) Pugsl. 3, S. Devon; Axmouth, Sir M. Abbot Anderson, det. T. Stephenson.

669/7d. Orchis latifolia L., var. coccinea Pugsl. H.20, Wicklow; Brittas Bay: H.21, Dublin; N. Bull (not seen by P.M.H.): H.28, Sligo; Rosses Point, J. E. Lousley and R. C. L. Burges, det. P. M. Hall.

669/7×9. Orchis latifolia L. × purpurella T. & T. A. Stephenson. 52, Anglesey; Cors Bodeilio, J. F. G. Chapple, det. P. M. Hall: S.W. of Llyn Cadarn and W. of Pen-y-Cefn, both near Llanbedrgôch: Newborough Warren: Wern, Red Wharf Bay, E. Milne-Redhead.

669/7×10. Orchis latifolia L. × maculata L. 52, Anglesey; Cors Goch and Cors Bodeilio, J. F. G. Chapple, det. P. M. Hall; Cors Bodeilio: Newborough Warren: Wern, Red Wharf Bay, E. Milne-Redhead.

669/7c×10. Orchis latifolia L., var. pulchella (Druce) Pugsl. × maculata L. 62, N.E. Yorks.; Fen Bog, H. Britten, comm. W. A. Sledge.

669/8. Orchis praetermissa Druce. 61, S.E. Yorks.; Bromfleet "delphs," A. K. Wilson, det. V. S. Summerhayes at Kew. 62, N.E. Yorks.; Helwath Beck, H. Britten, comm. W. A. Sledge.

669/8×11. Orchis praetermissa Druce × Fuchsii Druce =× O. Mortonii Druce. 62, N.E. Yorks.; Helwath Beck, H. Britten, comm. W. A. Sledge.

*669/9. Orchis purpurella T. & T. A. Stephenson. 40, Salop; marsh *c.* 1000 ft. near Stiperstones (Shelve district), "no other varieties growing with it," H. H. Hughes, det. and comm. A. J. Wilmott. 52, Anglesey; this species was seen in at least 12 separate localities by Messrs J. F. G. Chapple and E. Milne-Redhead during the Excursion in June 1937. A very large form at Llanfawr Quarry (where no other species was seen) resembled var. *crassifolia* T. Stephenson in *B.E.C. 1936 Rep.*, 356 (1937). Mr Milne-Redhead collected a pink-flowered form at Llandona: this is of interest in connection with my remarks in *B.E.C. 1936 Rep.*, 348 (1937).—P. M. Hall. *62, N.E. Yorks.; Saltersgate, H. Britten, comm. W. A. Sledge. 88, Mid Perth; Litigan, near Coshieville, P. M. Hall and W. A. Sledge. 108, W. Sutherland, Island of Handa, J. W. & H. Heslop Harrison (1937; 7). [Stated in error to be N.C.R.: see *B.E.C. 1936 Rep.*, 280 (1937), for previous record.—Ed.]

669/9. ORCHIS PURPURELLA T. & T. A. Stephenson. Specimens in Herb. Mus. Brit. from the following localities have been determined by Mr A. J. WILMOTT:—

*72, Dumfries; Garble Burn, Beattock, 1894, E. F. LINTON, as "*O. latifolia*."

*73, Kirkcudbright; Barcaple Moor, 1883, F. R. COLES, as *O. latifolia*.

*74, Wigtown; Portpatrick, M. S. CAMPBELL and A. J. WILMOTT (and hybrids with *O. Fuchsii* Druce).

*81, Berwick; North Berwick, 1910, I. M. HAYWARD (in Herb. E. S. Gregory as *O. latifolia*).

*86, Stirling; near Stirling, 1873, J. M. DUTHIE, as *O. latifolia*.

88, Mid Perth; Lawers: 1898, H. J. RIDDELSDELL; 1925, J. LID.

89, E. Perth; Borland, near Kirkmichael, 1936, A. J. WILMOTT (var. *pulchella* (Druce) Pugsl., also hybrids with *O. elodes*).

*90, Angus; Restennet, 1882, G. C. DRUCE, as *O. latifolia*: Rescobie Loch, 1924, A. J. WILMOTT.

92, S. Aberdeen; Strath Don, east of Corgarff, 1936, A. J. WILMOTT.

*96, Easterness; near Aviemore, 1922, C. E. SALMON, as *O. praetermissa*.

*98, Argyll; Strona, Moidart, S. M. MACVICAR, as *O. majalis* (in Herb. Ar. Bennett).

*103, Mid Ebudes; Mull, Heatherfield, 1876, G. Ross, as *O. latifolia* (possibly a hybrid with *O. elodes*, but *O. purpurella* certainly present).

104, Skye; Broadford, a form with peculiar short broad labellum with sides sharply dentate and middle lobe shorter and broad: near Sligachan, probably var. *pulchella* (Druce) Pugsl.: near Earlish, rich purple, leaves more or less spotted; all 1936, A. J. WILMOTT.

*105, W. Ross; above Loch Droma, a small rather lax-flowered form: Ullapool, typical; both 1935, A. J. WILMOTT. Cluanie, meadow by the inn (leaves usually unspotted, sometimes with spots): Torridon, Alligin Shuas: Diabaig (cf. var. *pulchella* (Druce) Pugsl.); all 1936, A. J. WILMOTT.

106, E. Ross; coast near Rockfield, 1890, E. S. MARSHALL, as *O. latifolia*: above L. Ussie, A. J. WILMOTT (var. *pulchella* (Druce) Pugsl. and hybrids with *O. elodes*).

108, W. Sutherland; Elphin (var. *pulchella* (Druce) Pugsl.), 1935, A. J. WILMOTT.

109, Caithness; near Bilbster, 1900, E. S. MARSHALL [No. 2458], as *O. latifolia*, var. *brevifolia* Reichb. fil.: Thurso, 1902, H. J. RIDDELSDELL, as *O. praetermissa* (det. A.J.W., var. *pulchella* (Druce) Pugsl.): Reay, 1902, H. J. RIDDELSDELL; 1935, A. J. WILMOTT.

111, Orkney; near Stromness, 1900, E. S. MARSHALL, both as *O. latifolia* and *O. incarnata*.

112, Shetland; Bressa, 1865, R. TATE, as *O. mascula*.

*H.7, S. Tipperary; near Newcastle, 1882, J. BRITTEN and G. NICHOLSON, as *O. latifolia*.

H.12, Wexford; N. of Wexford Harbour, 1896, E. S. MARSHALL [No. 1663], as *O.* "*latifolia*": near Rosslare Strand, 1934, A. J. WILMOTT.

669/9(2). ORCHIS MAJALIS Reichb., subsp. OCCIDENTALIS (Pugsl.) Pugsl. H.3, W. Cork; Goleen: H.16, W. Galway; Ballyconeely, near Bunowen; J. E. LOUSLEY and R. C. L. BURGES, det. P. M. HALL.

669/9(2)×10. ORCHIS MAJALIS Reichb., subsp. OCCIDENTALIS (Pugsl.) Pugsl. × MACULATA L. H.27, W. Mayo; near Mullaranny, J. E. LOUSLEY and R. C. L. BURGES.

669/10×8. ORCHIS MACULATA L. × PRAETERMISSA Druce =× *O.* HALLII Druce. 61, S.E. Yorks.; Bromfleet "delphs," A. K. WILSON, det. V. S. SUMMERHAYES at Kew.

669/10×9. ORCHIS MACULATA L. × PURPURELLA T. & T. A. Stephenson. 52, Anglesey; Red Wharf Bay, J. F. G. CHAPPLE, det. P. M. HALL: Newborough Warren: Llandona; E. MILNE-REDHEAD.

669/10×674/1. ORCHIS MACULATA L. × GYMNADENIA CONOPSEA (L.) R. Br. 52, Anglesey; Wern, Red Wharf Bay, E. MILNE-REDHEAD.

*669/11. ORCHIS FUCHSII Druce. 72, Dumfries; near Glencrosh, A. J. WILMOTT: Moffatdale, near Capelburn, 1907, E. S. MARSHALL, det. A.J.W. 74, Wigtown; Portpatrick, A.J.W. [add to *C.F.*, see *B.E.C. 1924 Rep.*, 597 (1925), for previous record.—ED.]. *75, Ayr; near Woodland, A.J.W. 88, Mid Perth; near Kinloch Rannoch, 1922, K. H. WRIGHT, det. A.J.W.

669/11×7. ORCHIS FUCHSII Druce × LATIFOLIA L. 52, Anglesey; Cors Bodeilio: Llanfihangel-Ty'n-Sylwy; E. MILNE-REDHEAD.

669/11×9. ORCHIS FUCHSII Druce × PURPURELLA T. & T. A. Stephenson. 52, Anglesey; Red Wharf Bay, J. F. G. CHAPPLE, det. P. M. HALL: Llanfihangel-Ty'n-Sylwy, E. MILNE-REDHEAD. 88, Mid Perth; Litigan, near Coshieville, P. M. HALL and W. A. SLEDGE.

669/11×10. ORCHIS FUCHSII Druce × MACULATA L. 52, Anglesey; S.W. of Llyn Cadarn, near Llanbedr-gôch, E. MILNE-REDHEAD. 62, N.E. Yorks.; Saltersgate, H. BRITTEN, comm. W. A. SLEDGE.

669/14×5. ORCHIS MASCULA L. × MORIO L. 62, N.E. Yorks.; Upgang, H. BRITTEN, comm. W. A. SLEDGE.

*669/18. HIMANTOGLOSSUM HIRCINUM (L.) Koch. 4, N. Devon; near Braunton, about 14 plants, Dr D. MUNRO SMITH, comm. F. R. ELLISTON WRIGHT. 22, Berks.; 5 plants at Letcombe Bassett, where one was found in 1936, Mrs E. C. BARNES. 24, Bucks.; 4 plants in the locality at Wendover where one was observed in 1934 (see *B.E.C. 1936 Rep.*, 280 (1937)).—J. F. G. CHAPPLE.

*672/2. OPHRYS SPHEGODES Mill. 13, W. Sussex (W.-Dod; 1937, 431).

672/3. OPHRYS APIFERA Huds. 33, E. Gloster; Andoversford: in 1936 a white-flowered specimen appeared, the position of which was carefully marked: in 1937 there was no sign of this plant, but 5-6 yards away a group of 4 plants appeared, about 2 inches apart from one another, three normal and one white-flowered; Miss L. ABELL.

*674/3. GYMNADENIA ALBIDA (L.) Rich. 13, W. Sussex (W.-Dod; 1937, 434).

674/3×1. GYMNADENIA ALBIDA (L.) Rich. × CONOPSEA (L.) R. Br. = × SCHWEINFURTHII Hég. 62, N.E. Yorks.; Saltersgate, H. BRITTEN, comm. W. A. SLEDGE.

†678/1. CROCUS NUDIFLORUS Sm. For 14, E. Sussex in *C.F.* read 13, W. Sussex (W.-Dod; 1937, 437).

†678/2. CROCUS VERNUS (L.) All. 27, E. Norfolk; Harleston: the field in which this species has long been known to grow has now been enclosed and utilised as a poultry and pig run: a few flowers were seen and photographed on March 27th, 1937, but it is unlikely that the plant will survive its present treatment: Syme describes the locality as near Mendham, but it is only on the Norfolk side of the county boundary.—J. E. LOUSLEY.

*†680/1. SISYRINCHIUM ANGUSTIFOLIUM Mill. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 437). †16, W. Kent; Hayes Common, 1934, but not since, D. MCCLINTOCK. [Add to *C.F.*, but see *B.E.C. 1913 Rep.*, 394 (1914), for previous record.—ED.]

*†685/1. GALANTHUS NIVALIS L. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 439).

689/1. RUSCUS ACULEATUS L. 50, Denbigh; two miles S.S.E. of Conway, F. TALFOURD JONES, comm. DEPT. BOT., NAT. MUS. WALES.

691/2. POLYGONATUM MULTIFLORUM (L.) All. 3, S. Devon; Sparkwell, E. M. PHILLIPS.

*691/3. POLYGONATUM OFFICINALE All. 13, W. Sussex, status rather doubtful (W.-Dod; 1937, 441).

*694/1. CONVALLARIA MAJALIS L. 13, W. Sussex (W.-Dod; 1937, 441).

702/3. ALLIUM SCORODOPRASUM L. 69, N. Lancs.; still plentiful near Pool Bridge, J. E. LOUSLEY.

702/4c. ALLIUM VINEALE L., var. COMPACTUM (Thuill.). 5, S. Somerset; Pike's Mill, Allerford, C. AMHERST.

702/9. ALLIUM OLERACEUM L. 3, S. Devon; on a wall at Hookhills, Paignton, F. M. DAY. *14, E. Sussex (W.-Dod; 1937, 443).

†704/1. MUSCARI COMOSUM L. 41, Glamorgan; golf links, The Leys, probably bird-sown, R. L. SMITH and F. NORTON.

*†707/1. ORNITHOGALUM PYRENAICUM L. 14, E. Sussex (W.-Dod; 1937, 445).

707/2. ORNITHOGALUM UMBELLATUM L. 7, N. Wilts.; Tockenham: Brimble Hill, Wroughton: Winterbourne Monkton: Etchilhampton Hill; in each case far from houses.—Grose (1937; 88). †9, Dorset; Handley: 11, S. Hants; Martin; H. J. GODDARD. *†14, E. Sussex (W.-Dod; 1937, 444).

†707/3. ORNITHOGALUM NUTANS L. 8, S. Wilts.; The Close, Salisbury, where it has been increasing for several years, Gullick (1937, 83).

†708/1. LILIUM MARTAGON L. 33, E. Gloster; Downton Wood, near Bourton-on-the-Hill, J. N. MILLS. *†41, Glamorgan; Coed Leyshon, P. WELLS, comm. DEPT. BOT., NAT. MUS. WALES.

*†708/2. LILIUM PYRENAICUM Gouan. 14, E. Sussex (W.-Dod; 1937, 445).

709/1. FRITILLARIA MELEAGRIS L. 7, N. Wilts.; the best "Fritillary field" near Minety was treated with a fertilizer in the winter of 1934-5, which resulted in a very poor showing of this species in the following spring: the plants were few in number and averaged only 4-5 inches in height: in 1936 they had regained their normal growth: masses of these flowers are gathered by travelling salesmen and hawked in the streets of Swindon and Cirencester.—Grose (1937; 89).

†710/1. TULIPA SYLVESTRIS L. 8, S. Wilts.; Redlynch, hedgebank; this colony, which has been known for many years, flowered in 1933 but immediately the flowers opened they were picked and the bulbs dug up by children.—Gullick (1937; 83). *†13, W. Sussex (W.-Dod; 1937, 445).

711/1. GAGEA LUTEA (L.) Ker-Gawler. 7, N. Wilts.; still at Wexcombe but rarely flowers, Grose (1937; 89). Delete from *C.F.* 14, E. Sussex (W.-Dod; 1937, 445). [W.-Dod makes no reference to any E. Sussex record but accepts a record for W. Sussex (which would be a N.C.R.) on doubtful evidence.—ED.]

713/1. COLCHICUM AUTUMNALE L. 33, E. Gloster; Guiting Wood, J. N. MILLS.

718/4×5. ×JUNCUS DIFFUSUS Hoppe. 20, Herts.; Croxley Moor, near Rickmansworth: 37, Worcs.; Hall Green, near Malvern; F. M. DAY.

718/12b. JUNCUS BULBOSUS L., var. KOCHII (F. Schultz) Druce. 8, S. Wilts.; near Donhead Cliff, J. D. GROSE.

718/12d. JUNCUS BULBOSUS L., var. ULIGINOSUS (Fries) Druce. 8, S. Wilts.; near Park Hill, Longleat, J. D. GROSE.

718/14. JUNCUS COMPRESSUS Jacq. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 448): see *J.B.*, 52 (1906), for previous record. 61, S.E. Yorks.; Bubwith, Miss C. M. ROB. 64, Mid West Yorks.; Fairburn, W. A. SLEDGE and G. A. NELSON: Nun Monckton, Miss C. M. ROB.

*718/15. JUNCUS GERARDI Lois. 64, Mid West Yorks.; near Fairburn, an inland locality, W. A. SLEDGE and G. A. NELSON.

†718/16. JUNCUS MACER S. F. Gray. 8, S. Wilts.; one plant near Alderbury Junction, 1936, Gullick (1937; 84). W.-Dod (1937; 449) gives a number of localities for this species in 14, E. Sussex, but only one (Hassocks) which may perhaps be in 13, W. Sussex: as this place is on the boundary of the two vice-counties it is better not to show this as a N.C.R.—ED. *†57, Derby; path in wood near Matlock, Miss E. S. TODD.

*718/19. JUNCUS CAPITATUS Weig. Alderney; very sparingly on sandy roadsides, Clanque, 1933, Jackson, Jackson and Airy-Shaw (1937, 299).

719/1. LUZULA SYLVATICA (L.) Gaud. 8, S. Wilts.; Marshwood, Dinton: Lower Semley Hill: Batt's Croft, Downton; Gullick (1937; 84).

719/3. LUZULA FORSTERI (Sm.) DC. 12, N. Hants.; near Fleet, G. A. R. WATTS.

†719/9. LUZULA ALBIDA DC. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 453): see *Science Gossip*, 188 (1889), for previous record.

722/1. SPARGANIUM NEGLECTUM Beeby. 3, S. Devon; Mansands, Brixham, F. M. DAY and G. T. FRASER. 33, E. Gloster; Upper Slaughter, F. M. DAY.

722/2. SPARGANIUM RAMOSUM Huds. 4, N. Devon; Torrington, W. KEBLE MARTIN.

723/1. ARUM ITALICUM Mill. Delete from *C.F.* 14, E. Sussex: no record is cited by W.-Dod (1937; 456).—ED. *Alderney; The Terrace, St Annes, 1934, Jackson, Jackson, and Airy-Shaw (1937, 300).

727/2. LEMNA POLYRHIZA L. 8, S. Wilts.; near Lady Down Farm, Trowbridge, J. D. GROSE.

727/4. LEMNA GIBBA L. 62, N.E. Yorks.; Sutton-on-Forest, Miss C. M. ROB.

*728/1. WOLFFIA ARRHIZA (L.) Wimm. 14, E. Sussex (W.-Dod; 1937, 458).

730/1. ALISMA RANUNCULOIDES L. In *C.F.*, p. 310, for "44-46" read "44-56."—ED.

737/3. POTAMOGETON DRUCEI Fryer. 22, Berks.; discovered in the R. Thames about 1½ miles below Cookham by Rev. D. M. Heath in 1934 and brought to me for confirmation: at the end of August 1937 in company with Mr J. S. Hughes I saw it growing here in considerable quantity with *P. lucens* L.: although there were numerous flowering spikes, no fruit was observed: this is the first time that it has been recorded from the main River Thames but it is not a new vice-county record, since at this point the whole of the river is included within Berkshire.—J. F. G. CHAPPLE.

737/4. POTAMOGETON COLORATUS Hornem. 63, S.W. Yorks.; Potteric Carr, W. A. SLEDGE.

737/9. POTAMOGETON GRAMINEUS L. Delete from *C.F.* 14, E. Sussex (W.-Dod; 1937, 463). 70, Cumberland; Thurstonfield Loch, R. W. BUTCHER.

737/13. POTAMOGETON LUCENS L. 8, S. Wilts.; Britford, Gullick (1937; 84).

737/16. POTAMOGETON PERFOLIATUS L. 8, S. Wilts.; R. Nadder, Bemerton to Salisbury: R. Avon, Salisbury to Britford; Gullick (1937; 84).

737/17. POTAMOGETON CRISPUS L. 8, S. Wilts.; Bishopstone: Clarendon Lake: R. Avon, S.E. of Salisbury; Gullick (1937; 84).

*737/25. POTAMOGETON PUSILLUS L., non auct. angl. (*P. panormitanus* Biv.-Bernh.) 57, Derby; canal at Cromfort, Matlock, Miss E. S. TODD, det. J. E. DANDY. *70, Cumberland; Thurstonfield Loch, R. W. BUTCHER.

737/28. POTAMOGETON PECTINATUS L. 8, S. Wilts.; R. Nadder, Bemerton to Salisbury: R. Avon, Britford; Gullick (1937; 84).

739/1. ZANNICHELLIA PALUSTRIS L. 8, S. Wilts.; River at Boyton: Clarendon Lake; Gullick (1937; 84).

739/2c. ZANNICHELLIA PEDICELLATA Fries, var. PEDUNCULATA (Reichb.) Pearsall. 3, S. Devon; Bradley Leet, Newton Abbot, G. T. FRASER, det. P. M. HALL. 61, S.E. Yorks.; Kilnsea, near Spurn, R. GOOD and W. A. SLEDGE.

*740/2. ZOSTERA NANA Roth. 14, E. Sussex (W.-Dod; 1937, 471).

745/1b. HELEOCHARIS PALUSTRIS (L.) R. Br., var. MAJOR Koch. 33, E. Gloster; Lower Slaughter, F. M. DAY.

745/4. HELEOCHARIS ACICULARIS (L.) R. Br. 70, Cumberland; Thurstonfield Loch, R. W. BUTCHER.

746/1. SCIRPUS SYLVATICUS L. 8, S. Wilts.; Stourton, Gullick (1937; 84).

746/3. SCIRPUS LACUSTRIS L. 70, Cumberland; Thurstonfield Loch, R. W. BUTCHER.

746/4. SCIRPUS TABERNAEMONTANI Gmel. 7, N. Wilts.; Greenhill Common, near Purton, J. D. GROSE, det. J. CHAPPLE.

746/5. SCIRPUS TRIQUETER L. Delete from *C.F.* 14, E. Sussex (W.-Dod; 1937, 475).

746/8. SCIRPUS PAUCIFLORUS Lightf. 12, N. Hants.; boggy heathland near Liphook, E. C. WALLACE. *14, E. Sussex (W.-Dod; 1937, 472).

746/11. SCIRPUS SETACEUS L. 61, S.E. Yorks.; Newbold Springs, A. K. WILSON.

746/12b. SCIRPUS FILIFORMIS Savi, var. MONOSTACHYS Clarke & Marshall. 45, Pembroke; Dowrog, J. D. GROSE.

746/13. SCIRPUS FLUITANS L. 8, S. Wilts.; Landford Common, J. D. GROSE. 70, Cumberland; Thurstonfield Loch, R. W. BUTCHER.

747/1. ERIOPHORUM LATIFOLIUM Hoppe. 12, N. Hants.; very abundant on heaths near Liphook, E. C. WALLACE.

749/1. SCHOENUS NIGRICANS L. 41, Glamorgan; Crumlyn Bog, Swansea, Miss M. THOMAS. [Not seen since recorded in *Phyt.*, 1844.—E. VACHELL.]

†750/1. CLADIUM MARISCUS (L.) R. Br. Add to *C.F.* 13, W. Sussex, planted (W.-Dod; 1937, 478): see *J.B.*, 419 (1901), for previous record.

753/1. CAREX PSEUDO-CYPERUS L. 7, N. Wilts.; Braydon Pond: Okus, Swindon: near Old Park Farm, Wootton Bassett: Hay Lane, Wroughton; J. D. GROSE. 37, Worcs.; Pixham, Powick, F. M. DAY. 59, S. Lancs.; near Preston, H. E. BUNKER.

753/4b. CAREX VESICARIA L., var. ALPIGENA Fr. 88, Mid Perth; north side of Meall nan Tarmachan, plants exactly like some collected by E. S. Marshall and so named by him from the same locality, R. MACKECHNIE and E. C. WALLACE.

753/8. CAREX LASIOCARPA Ehrh. 64, Mid West Yorks.; Tarn Moss, Malham, W. A. SLEDGE and G. A. NELSON. [It is remarkable that this species has not been recorded previously from so well-worked an area. —W.A.S.] *86, Stirling; Dubh Lochan, Rowardennan, R. MACKECHNIE.

753/9c. CAREX HIRTA L., var. HIRTIFORMIS Pers. 3, S. Devon; Dartington, G. T. FRASER, det. E. NELMES. 34, W. Gloster; Kempley, F. M. DAY.

753/9d. CAREX HIRTA L., var. SPINOSA Mort. 3, S. Devon; Exminster, G. T. FRASER, det. E. NELMES.

*753/10. CAREX PENDULA Huds. 52, Anglesey; near Plas Newydd, F. TALFOURD JONES, comm. DEPT. BOT., NAT. MUS. WALES.

753/12. CAREX STRIGOSA Huds. 37, Worcs.; Broad Moor Wood, W. H. HARDAKER. *62, N.E. Yorks.; Forge Valley, W. A. SLEDGE, *B.E.C. 1936 Rep.*, 414, 1937.

753/17. CAREX DISTANS L. 3, S. Devon; Budleigh Salterton: Exminster; G. T. FRASER. *Alderney; at the foot of Fort Albert, 1934, Jackson, Jackson, and Airy-Shaw (1937, 300).

753/19. CAREX HOSTIANA DC. 4, N. Devon; Molland, R. TAYLOR, comm. G. T. FRASER. 12, N. Hants.; Weaver's Down, near Liphook: Hazeley Heath; E. C. WALLACE. Add 14, E. Sussex to exceptions in *C.F.* (W.-Dod; 1937, 489).

753/20×19. CAREX FLAVA L. × HOSTIANA DC. 12, N. Hants.; boggy heath near Liphook, abundant, E. C. WALLACE.

753/21. CAREX LEPIDOCARPA Tausch. 3, S. Devon; Axmouth Bog, G. T. FRASER, det. E. NELMES. Add to *C.F.*, 14, E. Sussex (W.-Dod; 1937, 490): see *J.B.*, 96 (1909), for previous record. *H.15, S.E. Galway; Newtown, Gort, J. E. LOUSLEY and R. C. L. BURGES.

753/22. CAREX OEDERI Retz. Add to *C.F.* 13, W. Sussex and 14, E. Sussex (W.-Dod; 1937, 491): see *J.B.*, 54 (1906), for previous records. *62, N.E. Yorks.; Pilmoor, Mrs FOGGITT, Miss C. M. ROB, J. E. LOUSLEY and J. E. WOODHEAD.

753/22g. CAREX OEDERI Retz., var. OEDOCARPA Anderss. 3, S. Devon; Bonehill Down, Widecombe, F. M. DAY, det. E. NELMES. 45, Pembroke; Dowrog Moor, A. E. WADE and H. A. HYDE, comm. DEPT. BOT., NAT. MUS. WALES, as *C. flava* L., var. *oedocarpa*, under which name it appears in *B.P.L.*

753/23. CAREX EXTENSA Good. 3, S. Devon; Kingsteignton saltmarsh, G. T. FRASER. 52, Anglesey; Porth Dafarch, rocky downs nearly 100 ft. above sea-level, A. L. STILL.

753/25. CAREX DIGITATA L. 7, N. Wilts.; still at Colerne but in very small quantity, Grose (1937; 89).

753/27. CAREX HUMILIS Leysser. 8, S. Wilts.; Lamb Down, Codford: Down N. of Grovely Wood; Gullick (1937; 84).

753/31. CAREX TOMENTOSA L. 23, Oxon; wet pasture on Otmoor, J. P. M. BRENAN.

*753/34. CAREX PALLESCENS L. 61, S.E. Yorks.; Bubwith, Miss C. M. ROB. [This species is not given for v.-c. 61 in Robinson's *Flora, C.F.* or *Top. Bot.* and *Supps.*, but was recorded from Beverley some years ago.—W. A. SLEDGE.]

*753/37. CAREX MAGELLANICA Lam. (*C. irrigua* (Wahl.) Hoppe). 105, W. Ross; near Achnashellach, G. TAYLOR and Mrs SANDEMAN, det. A. J. WILMOTT.

753/39. CAREX RARIFLORA Sm. 88, Mid Perth; a nice colony on the watershed between Glen Lyon and Rannoch, R. MACKECHNIE and E. C. WALLACE. [Buchanan White, *Flora of Perthshire*, p. 331, cites a record for Meall Odhar, v.-c. 89 (P. Ewing); this station is apparently an outlier of the S. Aberdeenshire localities. It has, however, also been recorded from Lawers, 1899, and again from the extreme north of the county between Dalnaspidal and Dalwhinnie (*J.B.*, 1913, 167).—R.M.]

753/41. CAREX ATRATA L. 88, Mid Perth; on several hills on the north side of Glen Lyon, E. C. WALLACE.

753/45. CAREX HUDSONII Ar. Benn. 6, N. Somerset; very sparingly in a rhine on Weston-in-Gardano Moor, 1936, C. and N. Sandwith (1937, 179), det. E. Nelmes; the second locality in v.-c. 6.

753/46i. CAREX GRACILIS Curt., var. SPHAEROCARPA Uechtr. 14, E. Sussex; marsh, Kingston, N. Y. SANDWITH, det. E. NELMES. [W.-Dod (1937; 484) records this var. only from 13, W. Sussex, Bignor.—ED.]

753/47×49. CAREX AQUATILIS Wahl. × GOODENOWII Gay. H.16, W. Galway; above Maam Bridge, with both parents, J. E. LOUSLEY and R. C. L. BURGES.

NOTE.—*Chara fragifera* Durieu, *C. fragilis* Desvaux, and *C. delicatula* Agardh were inadvertently omitted from the *Comital Flora*. The following paragraphs should be appended to p. 398 of that book.—ED.

15.—C. fragifera Durieu.

Lacustral. Atlantic. Pools and ponds. Rare. Lowland.

Europe, S.; Africa, N.; Cape Colony.

Eng. 1. 1; Lizard, Scilly Isles.

Found by John Ralfs at Chy-an-hal Moor, near Penzance, and earlier at Tresco, Scilly Isles, by F. Townsend. See H. Trimen in Journ. Bot., 353, 1877.

16.—C. fragilis Desvaux (includes *Hedwigii* Hooker).

Lacustral. British. Ponds, streams, canals, clay-pits. Common. Lowland, 50-1100 ft. in Kerry. World-spread.

69. H 40. S.

1-3, 5, 6, 8-17, 19, 21-27, 29-34, 37-41, 49, 52-55, 57-60, 63, 65, 81, 83, 85, 86, 89, 90, 93, 97, 98, 104, 105, 108, 111, 112.

H—1-40.

Hooker, Brit. Fl., ii, 245, 1833.

17.—C. delicatula Agardh.

Lacustral. British. Ponds, pools, lakes, runnels. Local. Lowland.

Europe; Asia Minor; Japan; Africa, S.; Amer., S.

31. H (included in preceding species). **S.**

1, 6, 9-11, 16, 17, 23, 32, 34, 40, 41, 43, 45, 48, 52, 53, 55, 58, 60, 69, 73, 78, 92, 98, 104-106, 108, 111, 112. Imperfect.

"Almost throughout the British Isles. We have seen specimens from more than half the English and Welsh counties, from Cornwall and the Isle of Wight northwards, from the Channel Islands, and from more than three-quarters of the Scottish counties and two-thirds of the Irish counties, and it occurs probably in most of the others."—Groves and Bullock-Webster, *British Charophyta*, ii, 67.

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753/49. CAREX GOODENOWII Gay, forma PUMILA Kükenth. 3, S. Devon; Bonehill Down, Widecombe: 37, Worcestershire; Broadheath Common; F. M. DAY; det. E. NELMES.

753/49f. CAREX GOODENOWII Gay, var. MELAENA Wimm. 3, S. Devon; Teignhead, Lydford, W. KEBLE MARTIN and G. T. FRASER, det. E. NELMES.

*753/52. CAREX ELONGATA L. 14, E. Sussex (W.-Dod; 1937, 483).

†753/53(2). **Carex Crawfordii** Fernald in *Proc. Amer. Acad.*, *5*, 37, 469 (1902) [*C. winepegensis* C. B. Clarke ined.; *C. scoparia* Schkuhr, var. *minor* Boot]. 16, W. Kent; pit near Farnborough: native of Atlantic N. America: a few plants growing near *C. vulpinoidea* Michaux (see p. 459): of native British species this is nearest to *C. leporina* L., from which it may be distinguished at a glance by the very much narrower golden glumes.—J. E. LOUSLEY.

753/57×59. ×CAREX AXILLARIS Good. 34, W. Gloster; Kempley, F. M. DAY. [Add to *C.F.*; not N.C.R., see White, *Flora of Bristol*, 628 (1912).—ED.]

753/60. CAREX CONTIGUA Hoppe. 3, S. Devon; Kingsteignton, G. T. FRASER, det. E. NELMES. [This species is rare in Devon, many of Hiern's records and others belong to *C. Pairaei* F. Schultz.—G.T.F.] 12, N. Hants.; hedgebank near the waterworks, Greywell, P. M. HALL, H. W. PUGSLEY, E. C. WALLACE, and A. J. WILMOTT. 36, Hereford; Cummins Farm, Colwall: 37, Worcs.; Pixham, Powick; F. M. DAY, det. E. NELMES.

753/61. CAREX PAIRAEI F. Schultz. Delete from *C.F.* 14, E. Sussex (W.-Dod; 1937, 482). *88, Mid Perth; roadside bank west of Ballinluig: hedgebank, Weem, near Aberfeldy; P. M. HALL, R. MACKECHNIE, W. A. SLEDGE, and E. C. WALLACE. [A considerable extension of range: there does not appear to be any previous record north of Sedbergh, v.-c. 65.—ED.]

753/63×57. ×CAREX BOENNINGHAUSENIANA Weihe. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 481): see *J.B.*, 95 (1909), for previous record.

753/67. CAREX ARENARIA L. H.1, S. Kerry; stony shore of Caragh Lake, J. E. LOUSLEY and R. C. L. BURGES.

753/68. CAREX DIVISA Huds. 9, Dorset; Chesil Bank, Abbotsbury, Sir M. ABBOT ANDERSON and G. T. FRASER. Add to *C.F.* 14, E. Sussex (W.-Dod; 1937, 478-9): see *J.B.*, 54 (1906), for previous record. *41, Glamorgan; Saltmarsh near Cardiff, Miss E. VACHELL.

753/71. CAREX RUPESTRIS All. 88, Mid Perth; north side of Glen Lyon, R. MACKECHNIE and E. C. WALLACE. [A valuable record;

Buchanan White, *Flora of Perthshire*, p. 321, only cites two records for this species—"Ben Heasgarnich, 1886 (!)" and an unconfirmed record for Lawers; remove ? after 88 in *C.F.*—ED.]

753/74. CAREX PULICARIS L. 12, N. Hants.; in several meadows near Weaver's Down, Liphook, E. C. WALLACE. 69, Westmorland; Hutton Roof Crag, in limestone crevices, a very unusual habitat, J. E. LOUSLEY.

753/75. CAREX DIOICA L. 12, N. Hants.; in a small area on a heath near Liphook, E. C. WALLACE. [A welcome discovery of a species which has only been recorded twice previously in Hants.—ED.]

†754/1. PANICUM MILIACEUM L. 3, S. Devon; Newton Abbot tip, Wolborough, G. T. FRASER.

†754/8. ECHINOCHLOA CRUS-GALLI (L.) Beauv. 3, S. Devon; Newton Abbot tip, Wolborough, A. CRAWSHAW and T. STEPHENSON. *†7, N. Wilts.; Bromham, Miss B. GULLICK and J. D. GROSE. †16, W. Kent; Hayes, D. MCCLINTOCK.

†754/8c. ECHINOCHLOA CRUS-GALLI (L.) Beauv., var. ARISTATA S. F. Gray. 16, W. Kent; Greenstreet Green, near Farnborough, J. E. LOUSLEY.

*†754/10. DIGITARIA SANGUINALIS (L.) Scop. 8, S. Wilts.; casual in garden, Salisbury, 1933, Gullick (1937; 84). *†13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 494). *†16, W. Kent; Chislehurst and Bickley, D. MCCLINTOCK.

†756/1. SETARIA ITALICA (L.) Beauv. 23, Oxon.; waste ground, Oxford, J. P. M. BRENAN and J. F. G. CHAPPLE. †41, Glamorgan; rubbish heap, Penarth Road, Cardiff, R. L. SMITH and F. NORTON, as *Panicum italicum* L.

†756/2. SETARIA VIRIDIS (L.) Beauv. 3, S. Devon; Newton Abbot tip, Wolborough, G. T. FRASER. Add to *C.F.* †13, W. Sussex (W.-Dod; 1937, 494): see *J.B.*, 55 (1906), for previous record.

†758/3. SPARTINA TOWNSENDII H. & J. Groves. 3, S. Devon; Dawlish Warren: with reference to the record in *B.E.C. 1936 Rep.*, 288 (1937), the Secretary of the Warren Golf Club informs me that 1000 setts were planted out in November 1935.—G. T. FRASER. *14, E. Sussex (W.-Dod; 1937, 496). 15, E. Kent; Pegwell Bay, Miss E. DAY. 41, Glamorgan; Aberthaw, spontaneous, Hon. G. CHARTERIS. *53, S. Lincs.; Holbeach St Matthew, Miss M. BROWN, see p. 434.
*†51, Flint; opposite Connah's Quay on the Dee Estuary: 1000 sets planted on bare sand in February 1928 had disappeared by 1934. 58, Cheshire; Mersey Estuary near Stanlow Point: the origin of the plant in this locality is obscure but it was probably spontaneous: by 1931 it

had spread so much that the Port of Liverpool authorities took steps to remove it and by 1936 none remained. †59, S. Lancs.; planted for reclamation of foreshore north of Southport, 1936, and likely to be crowded out by planted *Puccinellia maritima*: planted twice near mouth of R. Alt, Hightown, to prevent coast erosion and extirpated in 1931-2. —J. D. Massey (*NW. Nat.*, *12*, No. 3, 308-310).

†763/2. SORGHUM HALEPENSE (L.) Pers. 41, Glamorgan; rubbish heap, Penarth Road, Cardiff, R. L. SMITH and F. NORTON.

†765/7b. PHALARIS PARADOXA L., var. PRAEMORSA Coss. & Dur. 39, Staffs.; waste ground, Burton-on-Trent, J. P. M. BRENAN and J. F. G. CHAPPLE, det. C. E. HUBBARD.

†766/2. ANTHOXANTHUM ARISTATUM Boiss. Delete from *C.F.* 14, E. Sussex and add 13, W. Sussex (W.-Dod; 1937, 497): for previous record for 13 see *J.B.*, 96 (1909).

†770/3b. ALOPECURUS AGRESTIS L., var. **tonsus** Blanche. See *B.E.C. 1936 Rep.*, 415, 1937.

770/5×1. ×ALOPECURUS HYBRIDUS Wimm. 12, N. Hants.; marshy field on south side of R. Blackwater between Eversley Cross and Finchampstead: 17, Surrey; marshy fields near Pyrford Lock and near Newark Abbey: 21, Middlesex; marshy field by canal, Harefield; A. H. G. ALSTON and N. Y. SANDWITH, confirmed by C. E. HUBBARD. A variable hybrid, the best intermediate of the above being that from Pyrford Lock, while that from Harefield approaches *A. pratensis* L. very closely: previously recorded from Surrey, but apparently new to Hants and Middlesex.

†777/1k. PHLEUM PRATENSE L., var. BERTOLONII Beck. 17, Surrey; Carshalton, casual in allotment, G. BETTLES, comm. A. L. STILL; det. KEW.

777/2. PHLEUM ALPINUM L. 88, Mid Perth; north side of Meall nan Tarmachan, three plants only, R. MACKECHNIE and E. C. WALLACE.

†780/1. AGROSTIS SEMIVERTICILLATA (Forssk.) C. Christens. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 502): see *B.E.C. 1923 Rep.*, 231 (1924), for previous record. *†33, E. Gloster.; in abundance on the edge of a lily-pool in the overgrown grounds of Treherne Court, near Frampton-on-Severn, Mrs VEREY, det. C. E. HUBBARD.

780/4. AGROSTIS SETACEA Curtis. 8, S. Wilts.; abundant on Alderbury Common, now a plantation, Gullick (1937; 84): Landford Common, J. D. GROSE.

783/1. CALAMAGROSTIS EPIGEIOS (L.) Roth. 3, S. Devon; cliffs near Exmouth, F. M. DAY. 16, W. Kent; Hayes Common, D. MCCLINTOCK.

*108, W. Sutherland; Island of Handa: the most northerly British locality yet recorded.—J. W. and H. Heslop Harrison (1937; 8).

785/1. APERA SPICA-VENTI (L.) Beauv. Add to *C.F.* 13, W. Sussex and 14, E. Sussex (W.-Dod; 1937, 504): see *J.B.*, 96 (1909), for previous records.

*787/2. ×AMMOPHILA BALTICA Link. 108, W. Sutherland; Island of Handa, with *Calamagrostis epigeios* (L.) Roth and *Ammophila arenaria* (L.) Link; new to Scotland; the inflorescences were more compact than is the case at Ross Links (v.-c. 68).—J. W. and H. Heslop Harrison (1937; 8).

791/4. DESCHAMPSIA FLEXUOSA (L.) Trin. 8, S. Wilts.; Langley Wood, Redlynch: Semley: Donhead St Mary, Gullick (1937; 84).

†794/6. AVENA STRIGOSA Schreb. 66, Durham; near Birtley, H. Heslop Harrison (*Vasc.*, *23*, No. 3, 108). †90, Angus; barley-field near Loch Lintrathen, R. H. and M. CORSTORPHINE and A. L. STILL.

800/1. SIEGLINGIA DECUMBENS (L.) Bernh. 61, S.E. Yorks.; Allerthorpe Common: Bromfleet; A. K. WILSON.

802/1d. PHRAGMITES COMMUNIS Trin., var. FLAVESCENS Custer. 3, S. Devon; Abbotskerswell, T. STEPHENSON.

†808/1. CYNOSURUS ECHINATUS L. 21, Middlesex; gravel-pit near Chiswick Bridge, Lady ALETHEA ELIOT.

813/1. MOLINIA CAERULEA (L.) Moench. 7, N. Wilts.; Chilton Foliat, Grose (1937; 89).

814/1. CATABROSA AQUATICA (L.) Beauv. 3, S. Devon; Exminster, F. M. DAY and G. T. FRASER: Preston, Kingsteignton, 1936, G. T. FRASER: near Dawlish Warren, 1936, T. STEPHENSON. 8, S. Wilts.; Bemerton: Bishopstone: S. of Downton: Donhead St Andrew, Gullick (1937; 84). 75, Ayr; Ardrossan, D. MCCLINTOCK, det. C. E. HUBBARD at Kew. [Add to *C.F.*, but not N.C.R., see *Top. Bot., Supp.* i, 105 (1905).—ED.

†815/6. ERAGROSTIS PILOSA (L.) Beauv. 61, S.E. Yorks.; Olympia sidings, 1933, W. A. SLEDGE, det. C. E. HUBBARD.

*818/1. MELICA NUTANS L. 48, Merioneth; woodland on the western flank of Craig-y-Benglog, E. PRICE EVANS, comm. DEPT. BOT., NAT. MUS. WALES.

819/1b. DACTYLIS GLOMERATA L., var. ABBREVIATA Drej. 3, S. Devon; Berry Head, Brixham: Bigbury, G. T. FRASER.

824/3. Poa pratensis L., var. subcaerulea (Sm.). 107, E. Sutherland; Brora Sands, Dornoch, Miss E. S. Todd, det. C. E. Hubbard.

*824/4. Poa irrigata Lindm. Alderney; above Watermill Farm, 1934, Jackson, Jackson, and Airy-Shaw (1937, 300).

824/10c. Poa compressa L., var. polynoda Parn. 17, Surrey; pasture, Woodcote Park, Epsom, E. C. Wallace, det. W. O. Howarth.

*825/3b. Glyceria declinata Bréb. 108, W. Sutherland; Island of Handa, J. W. and H. Heslop Harrison (1937; 9).

825/4. Puccinellia distans (L.) Parl. 3, S. Devon; Exminster, F. M. Day and G. T. Fraser: Kingsbridge, T. Stephenson; both det. C. E. Hubbard. 66, Durham; Billingham Marshes (an inland locality), H. Heslop Harrison (*Vasc.*, *23*, No. 3, 108).

*825/7. Puccinellia fasciculata Bickn. 14, E. Sussex (W.-Dod; 1937, 517).

825/8. Puccinellia rupestris (With.) Fern. & Weath. 3, S. Devon; Exminster, G. T. Fraser, det. C. E. Hubbard.

826/1. Scleropoa rigida (L.) Griseb. 23, Oxon.; near Broughton, J. P. M. Brenan and J. F. G. Chapple.

826/7c. Festuca rubra L., var. dumetorum (L.) How. 43, Radnor; New Radnor, J. F. G. Chapple and N. D. Simpson, det. W. O. Howarth.

826/7e. Festuca rubra L., var. glaucescens Heg. & Heer. 43, Radnor; New Radnor, J. F. G. Chapple and N. D. Simpson, det. W. O. Howarth.

826/12. Festuca capillata Lam. 8, S. Wilts.; Landford Common, J. D. Grose.

†826(2)/1. Nardurus maritimus (L.) Janchen. 6, N. Somerset; Bristol tip, J. P. M. Brenan and Mrs C. I. Sandwith.

*†827/1(2). Bromus Gussonei Parl. 15, E. Kent; cliffs at Ramsgate, A. H. Carter, comm. J. E. Lousley. *†55, Leicester; near Narborough, railway embankment, A. E. Wade, comm. Dept. Bot., Nat. Mus. Wales (as *B. rigens* L.).

827/5. Bromus madritensis L. W.-Dod (1937) gives no records for 14, E. Sussex: delete in *C.F.*—Ed.

†827/9. Bromus inermis Leyss. 20, Herts.; well-naturalized along the canal near Tring Station, Miss M. Brown. †34, W. Gloster; Filton railway at Stoke Gifford, 1936, I. Evans (Sandwith; 1937, 180).

†827/13. BROMUS UNIOLOIDES H. B. K. 3, S. Devon; Harford, T. STEPHENSON, det. A. J. WILMOTT.

827/17. BROMUS COMMUTATUS Schrad. Jersey; St Brelade's, J. F. G. CHAPPLE: Guernsey; 1936, Lady DAVY; both det. C. E. HUBBARD. [Although *C.F.* does not record "S.", there are records for Jersey, Guernsey and Sark in *J.B.*, 428 (1907).—ED.]

*827/18. BROMUS RACEMOSUS L. 13, W. Sussex (W.-Dod; 1937, 525). Add to *C.F.* 14, E. Sussex (W.-Dod; *loc. cit.*): see *J.B.*, 96 (1909), for previous record.

827/19b. BROMUS HORDEACEUS L., var. GLABRATUS (Hartm.). Jersey; St Ouen's, J. F. G. CHAPPLE, det. C. E. HUBBARD.

827/19e. BROMUS HORDEACEUS L., var. PSEUDO-RACEMOSUS (Wats.) Asch. & Graebn. 1, W. Cornwall; roadside, Ruan Minor, N. Y. SANDWITH, confirmed by C. E. HUBBARD.

827/19i. BROMUS HORDEACEUS L., var. THOMINII (Hardouin) Aschers. & Graebn. Jersey; La Poulente: La Moie: St Ouen's, a form with hairy spikelets; J. F. G. CHAPPLE, det. C. E. HUBBARD.

827/19(2). BROMUS LEPIDUS O. R. Holmberg. 6, N. Somerset; old quarry near Twerton-on-Avon, 1936, C. and N. Sandwith (1937, 179).

*†827/20. BROMUS MOLLIFORMIS Lloyd. 39, Staffs.; Burton-on-Trent, J. P. M. BRENAN and J. F. G. CHAPPLE, det. C. E. HUBBARD.

827/21. BROMUS INTERRUPTUS Druce. Add to *C.F.* 13, W. Sussex (*J.B.*; 1906, 56), a record which has been overlooked by W.-Dod (1937; 526).—ED.

†827/22. BROMUS ARVENSIS L. 66, Durham; near Birtley, H. Heslop Harrison (*Vasc.*, *23*, No. 3, 108).

†827/24. BROMUS SCOPARIUS L. 6, N. Somerset; Bristol tip, J. P. M. BRENAN and MRS C. I. SANDWITH.

†827/26c. **Bromus Danthoniae** Trin. (*A. macrostachys* Desf., var. *triaristatus* Hack. of *B.P.L.*). 6, N. Somerset; tip, Bristol, Mrs C. I. SANDWITH and J. P. M. BRENAN.

†828/3. BRACHYPODIUM DISTACHYON (L.) Beauv. 34, W. Gloster; Avonmouth Docks, J. P. M. BRENAN.

†829/2. LOLIUM TEMULENTUM L. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 528-9): see *J.B.*, 97 (1909), for previous record.

†829/3. LOLIUM REMOTUM Schrank. Add to *C.F.* 13, W. Sussex (W.-Dod; 1937, 528): see *J.B.*, 97 (1909), for previous record. *C.F.* records 14, E. Sussex for which there are no records in W.-Dod (*loc. cit.*). —ED.

†829/4b. LOLIUM MULTIFLORUM Lam., var. ITALICUM A. Braun. 3, S. Devon; Newton Abbot tip, Wolborough, G. T. FRASER.

†829/4c. LOLIUM MULTIFLORUM Lam., var. COMPOSITUM (Thuill.) Mutel. 3, S. Devon; Newton Abbot tip, Wolborough, G. T. FRASER.

830. AGROPYRON Gaertn. All the Devon specimens of *A. pungens* and *A. repens* were determined by C. E. HUBBARD at Kew.

830/2. AGROPYRON PUNGENS (Pers.) Roemer & Schultes. 3, S. Devon; Dawlish Warren, G. T. FRASER.

830/2d. AGROPYRON PUNGENS (Pers.) Roemer & Schultes, var. ARISTATUM Hack. 3, S. Devon; Exminster: Dawlish Warren, 1936; G. T. FRASER. 41, Glamorgan; crevices of rocks on shore, Sully, A. E. WADE, comm. DEPT. BOT., NAT. MUS. WALES.

830/4. AGROPYRON REPENS (L.) Beauv. 3, S. Devon; Dawlish Warren, E. M. PHILLIPS; "a form with the upper surface of the leaf-blade not prominently ribbed and bearing scattered longer hairs," det. C. E. HUBBARD.

830/4b. AGROPYRON REPENS (L.) Beauv., var. DUMETORUM (Hoffm.) S. F. Gray. 3, S. Devon; Bere Ferrers, E. M. PHILLIPS.

830/4c. AGROPYRON REPENS (L.) Beauv., var. ARISTATUM Baumg. (=*Triticum Leersianum* Roemer & Schultes.) 3, S. Devon; Abbotskerswell, T. STEPHENSON.

830/4d. AGROPYRON REPENS (L.) Beauv., var. VAILLANTIANUM (Schinz & Keller) Roemer & Schultes. 3, S. Devon; Bere Ferrers, E. M. PHILLIPS: Exminster, G. T. FRASER.

830/4e. AGROPYRON REPENS (L.) Beauv., var. LASIORACHIS Hack. 3, S. Devon; Bere Ferrers, E. M. PHILLIPS: Exminster, G. T. FRASER: Kingsteignton, T. STEPHENSON.

830/4f. AGROPYRON REPENS (L.) Beauv., var. GLAUCUM Doell. 3, S. Devon; Bere Ferrers, E. M. PHILLIPS: Exminster, F. M. DAY and G. T. FRASER: Haccombe, G. T. FRASER.

830/6. AGROPYRON CANINUM (L.) Beauv. 3, S. Devon; Torbryan: Abbotskerswell; T. STEPHENSON.

†830/10. **Agropyron Buonapartis** (Spreng.) Dur. & Schinz. (*A. patulum* Trin. of *B.P.L.*). 6, N. Somerset; tip, Bristol, Mrs C. I. SANDWITH and J. P. M. BRENAN.

†831/1. SECALE CEREALE L. 23, Oxon.; waste ground, Oxford, J. P. M. BRENAN and J. F. G. Chapple, det. C. E. HUBBARD.

†832/11. AEGILOPS CYLINDRICA Host. 41, Glamorgan; rubbish heap, Penarth Road, Cardiff, Mrs SANDWITH, J. P. M. BRENAN and R. L. SMITH.

833/1. PHOLIURUS FILIFORMIS (Roth) Schinz & Thellung. 3, S. Devon; Bere Ferrers, W. KEBLE MARTIN, G. T. FRASER and E. M. PHILLIPS.

†835/7. HORDEUM JUBATUM L. 17, Surrey; Postford Mill, Lady V. RUSSELL and Miss E. VACHELL.

†835/10. HORDEUM VULGARE L. 39, Staffs.; waste ground, Burton-on-Trent, J. P. M. BRENAN and J. F. G. CHAPPLE.

†835/12. HORDEUM DISTICHON L. 23, Oxon.; waste ground, Oxford, J. P. M. BRENAN and J. F. G. CHAPPLE, det. C. E. HUBBARD.

†836/1. ELYMUS ARENARIUS L. 66, Durham; railway embankment south of Billingham station, H. Heslop Harrison (*Vasc.*, *23*, No. 3, 108).

†836/4. ELYMUS CAPUT-MEDUSAE L. 16, W. Kent; Tonbridge tip, J. P. M. BRENAN.

†836/8. **Elymus Delileanus** Schultes, *Mantissa*, *2*, 424. *E. geniculatus* Delile, *Fl. Eg.*, 174, non Curtis. *E. rachitrichus* Hochst. ex Jaubert & Spach, *Illustr.*, *4*, 30. *Crithopsis rhachitricha* Jaub. & Spach, *l.c.* Syria, Palestine, Egypt, Persia: adventive at Port Juvenal, France. 6, N. Somerset; Bristol tip, J. P. M. BRENAN and Mrs C. I. SANDWITH.

*839/1. JUNIPERUS COMMUNIS L. 44, Carmarthen; a solitary bush, rocky mountain-side, near Ystradffin, Llanfair-ar-y-bryn, J. F. JONES, comm. DEPT. BOT., NAT. MUS. WALES.

*†841/1. PINUS SYLVESTRIS L. 13, W. Sussex and *†14, E. Sussex (W.-Dod; 1937, 535).

844/2c. EQUISETUM ARVENSE L., var. NEMOROSUM H. Braun. 33, E. Gloster; Little Barrington, F. M. DAY. 88, Mid Perth; roadside ditch, Pass of Lyon, E. C. WALLACE.

*844/2×5. ×EQUISETUM LITORALE Kühl. 12, N. Hants.; ditch and canal-bank between North Warnborough and Odiham, A. H. G. ALSTON and N. Y. SANDWITH. *H.2, N. Kerry; E. shore of Lower Lake, Killarney, 1936, P. M. HALL and N. D. SIMPSON, det. A. H. G. ALSTON.

844/3d. EQUISETUM SYLVATICUM L., var. CAPILLARE Hoffm. 88, Mid Perth; Drummond Hill opposite Fortingall, E. C. WALLACE.

844/7. EQUISETUM HYEMALE L. 88, Mid Perth; many plants over a small area of wet stony moorland in the Invervar Corrie, Glen Lyon, *c.* 2000 ft., R. MACKECHNIE and E. C. WALLACE. [An unexpected find at so high an elevation; the only other record I know of this species at subalpine or alpine level is C. E. Salmon's in *Journ. Bot.*, 1903, 275, for v.-c. 97—" sparingly on Gulvain at 1750 ft. Mr Bennett tells me it is very scarce in West Scotland, and its occurrence at this elevation was previously unknown to him; see his article in *Ann. Scot. Nat.* for January 1903, 47."—E.C.W. Druce, *C.F.*, 378, in addition to the Gulvain altitude, refers to " 1700 ft. in Co. Down."—ED.]

844/9. EQUISETUM VARIEGATUM (Schleich.) Weber. 65, N.W. Yorks.; Kisdon Force, near Keld, W. A. SLEDGE.

851/1. ASPLENIUM MARINUM L. 45, Pembroke; Broadhaven, J. F. G. CHAPPLE.

851/9. ASPLENIUM SEPTENTRIONALE (L.) Hoffm. 3, S. Devon; high rocks in the Teign valley, W. KEBLE MARTIN, confirming a record by Briggs and Rogers in *Journ. Bot.*, 1882.

854/3. POLYSTICHUM ACULEATUM Roth. 33, E. Gloster; Hilcot, Miss L. ABELL.

856/4b. DRYOPTERIS DILATATA Presl, var. TANACETIFOLIA Lam. & DC. 8, S. Wilts.; Stourton: Semley Hill; J. D. GROSE, det. A. H. G. ALSTON.

856/5. DRYOPTERIS AEMULA (Ait.) O. Kuntze. Add 67, S. Northumberland to *C.F.*, Temperley (1937 A, 10).

856/11. PHEGOPTERIS ROBERTIANA (Hoffm.) J. A. Braun. 33, E. Gloster; Andoversford, Miss L. ABELL.

857/4. CYSTOPTERIS FRAGILIS (L.) Bernh. Bracket in *C.F.* 13, W. Sussex as doubtful and add *14, E. Sussex, also in brackets as doubtful (W.-Dod; 1937, 541).

859/1. CETERACH OFFICINARUM Lam. & DC. 16, W. Kent; Hayes, D. MCCLINTOCK.

863/1. HYMENOPHYLLUM TUNBRIDGENSE (L.) Sm. Bracket in *C.F.* 13, W. Sussex, error (W.-Dod; 1936, 535).

863/2. HYMENOPHYLLUM PELTATUM Desv. Add 67, S. Northumberland to *C.F.*, Temperley (1937A, 10).

865/1. BOTRYCHIUM LUNARIA (L.) Sw. 3, S. Devon; Lustleigh Cleave, Miss G. TUCKER, comm. G. T. FRASER.

866/1. OPHIOGLOSSUM VULGATUM L. 3, S. Devon; Lustleigh Cleave, Miss G. TUCKER, comm. G. T. FRASER.

*867/1. PILULARIA GLOBULIFERA L. 13, W. Sussex (W.-Dod; 1937, 552).

†868/1. AZOLLA FILICULOIDES Lam. 20, Herts.; Hertford Heath, D. McCLINTOCK. †22, Berks.; pond, Leighton Park, J. W. HAUGHTON.

870/6. LYCOPODIUM INUNDATUM L. 8, S. Wilts.; sparingly on Landford Common, Gullick (1937; 84).

870/7. LYCOPODIUM SELAGO L. 3, S. Devon; Widecombe, T. STEPHENSON.

872/2b. NITELLA OPACA Ag., var. ATTENUATA Ag. 3, S. Devon; Kennick Reservoir, Bridford and Christow parishes: seen only in the Upper Reservoir (Torquay Waterworks) and apparently confined to the west side, in water from 1 to 8 feet deep; G. T. FRASER, det. G. O. ALLEN.

*872/5. NITELLA TRANSLUCENS Agardh. 14, E. Sussex (W.-Dod; 1937, 556).

873/2. TOLYPELLA PROLIFERA Leonh. Delete from *C.F.* 14, E. Sussex (W.-Dod; 1937, 556).

873/3. TOLYPELLA GLOMERATA Leonh. 61, S.E. Yorks.; Kilnsea, near Spurn, R. GOOD and W. A. SLEDGE.

*876/16. CHARA GLOBULARIS Thuill. 4, N. Devon; Meldon quarry, G. T. FRASER and W. KEBLE MARTIN, det. G. O. ALLEN. 59, S. Lancs., canal, Reddish, Miss E. S. TODD, det. G. O. ALLEN.

*876/17. CHARA DELICATULA Agardh. 13, W. Sussex and *14, E. Sussex (W.-Dod; 1937, 553).

SOME FLOWERING-TIME FACTS AND PROBLEMS.

F. Rilstone, A.L.S.

The fact that the south-western parts of the British Isles form an early-flowering area for the first spring flowers is so well advertised commercially that the balancing fact of its being a *late* area for summer flowering is almost entirely overlooked.

Little is known of the relative flowering times of most British plants, but records of the first flowering each season of eighteen well-known species in a great many stations all over the British Isles are received and tabulated by the Phenological Committee of the Royal Meteorological Society. This is a mere fraction of the total number of our species, but the results allow the formulation of certain general rules and provide a few puzzling problems.

Flowering-time for the purpose of these records may perhaps be fittingly compared with the flowing tide. In early spring the tide sets in strongly from the south-west. In summer it flows, and in late summer perhaps just as strongly, from the south-east. Two or three examples from the Committee's 35-year averages will show this change of direction.

The blackthorn, *Prunus spinosa*, has its first flowers open in the south of Ireland on March 23rd, S.E. England waits till April 4th for the first blossom, N.W. England till April 12th, N.E. England till April 17th, and N. Scotland till April 25th. But the flowering season of *Chrysanthemum Leucanthemum* begins in S.E. England on May 21st, reaches S. Ireland on May 24th, N.W. England on June 3rd, N.E. England on June 6th, and N. Scotland on June 16th. Corresponding dates for *Centaurea nigra* (agg.) are S.E. England June 20th, S. Ireland July 3rd, and N. Scotland July 23rd.

The following table gives a picture of the swing-over of the floral tide from S.W. to S.E.:—

Ranunculus Ficaria—S. Ireland 18 days earlier than S.E. England.

Prunus spinosa—S. Ireland 12 days earlier than S.E. England.

Aesculus Hippocastanum—S. Ireland 3 days earlier than S.E. England.

Crataegus oxyacantha (agg.)—S. Ireland 1 day earlier than S.E. England.

Rosa canina—S. Ireland 3 days later than S.E. England.

Centaurea nigra (agg.)—S. Ireland 13 days later than S.E. England.

This gives plainly enough the general trend of the flowering progression. And clearly it is to be explained in terms of temperature. In winter and spring the south-west is warmer than the south-east, but with the advance of summer the position is reversed and in the

speeding up of flowering dates by extra warmth the south-east naturally has the advantage.

Considering that water absorbs heat more slowly than land, it is probable that marsh and bog plants in the west are still more retarded than those shown on the list. Thus the Editor in his account of the Irish marsh orchids in the 1936 Report mentions that he saw no spikes of *O. latifolia* in Ireland during the latter part of May, though in Hants and Dorset the species was then well in flower.

The set of the late summer flowering progression is not so clearly shown as that of early spring, since *Centaurea nigra* is the only plant given in the lists showing such a marked difference between S.E. England and S. Ireland. Of the other late-summer plants given, *Campanula rotundifolia* shows S.E. England one day earlier than S. Ireland and 12 days earlier than N. Scotland, and *Convolvulus sepium* 5 days and 15 days earlier respectively, while *Scabiosa Succisa* is in a class all its own.

The flowering progression of the last-named, indeed, is quite a puzzle. It is always in flower in N. Scotland before it opens elsewhere.[1] Thus in 1936 it was reported thence on July 17th, and the progression then swept southward, reaching N.E. England on August 1st, S. Ireland on August 4th, and S.E. England on August 8th. There must be a reason for this reversal of the usual order. But what can it be? Is it a matter of light intensity? And are there any other plants which resemble it in this respect?

The writer would suggest that some interesting facts might come to light if a number of members of this Society in various parts of the country would keep, even for a single season, records of first flowering dates of all our commoner plants.

A minor puzzle is provided by the pistillate flowers of the hazel, the season of which opens in S.E. England on an average on February 1st and a day later in S. Ireland. Possibly shrubs with flower-buds ripened on woody branches during the previous summer may not be expected to conform to the same law as non-woody plants. The fact that the ivy has a south-west to north-east progression from September 20th in the south-west to October 18th in N. Scotland seems to support this suggestion.

[1] "There seems to be some evidence that the Devil's-bit Scabious flowers earlier in the North of England than in the South . . . it never fails to begin flowering . . . here (Aberystwyth) by the 10th of June."—J. H. Salter (*NW. Nat.*, *12*, No. 4, 402-403).

RIVAR: A TOPOGRAPHICAL NOTE.

J. D. Grose.

There has been considerable confusion about the records for *Myosotis sylvatica* Ehrh. in the Rivar district on the borders of Berks and Wilts. The difficulties will be appreciated when it is explained that there are no less than four woods with the word "Rivar" in their names, that the spellings "River" and "Riever" have been frequently used in the past, and that the county boundary in this neighbourhood has been changed three times.

There are two stations for *M. sylvatica*.

1. Rivar Copse. This wood is known locally as "Great Rivar Copse," but is named simply "Rivar Copse" on the 6-inch Ordnance Survey. As mentioned by Mr P. M. Hall (*B.E.C. 1936 Rep.*, 407 (1937)), it is left without a name on the 1-inch O.S., but may be identified by the word "Tumulus" printed across it. Most of the wood is in Berks, but a small portion in the south-western corner is in Wilts. The plant grows along the southern boundary of the wood, and reaches to within about five yards of the Wiltshire boundary. I am firmly of the opinion that the plant has not been found on the Wiltshire side of the division because here the mixed character of the wood gives place immediately to a beech plantation, where it is most unlikely that this species would grow. Despite successive boundary changes, this station has always been in Berkshire.

2. Rivar Firs. This locality is nearly 2½ miles west of Rivar Copse. On the 1-inch O.S. it is the northernmost copse of the group on Rivar Hill. *M. sylvatica* is here much more abundant than in the first locality. The first Ordnance Survey, 1817, shows a detached portion of Berkshire south of Rivar Hill, but Rivar Firs is shown as just in Wiltshire. Apparently, however, this was a mistake, as when in 1844 the supposedly detached portion was transferred to Wilts, it was ascertained that this area was joined to Berks by a narrow neck of land. The transfer was consequently annulled, and the district remained in Berks. Rivar Firs is situated in this neck of land, so it is certain that whatever the position before 1844, from this date for many years the station was in Berks. In 1895 the boundary was again changed, and Rivar Firs was finally (let us hope) placed in Wiltshire.

The first certain find of *M. sylvatica* in the Rivar district was by Dr Druce in 1890, afterwards recorded in the *B.E.C. 1896 Report*. The record is repeated in *Fl. Berks*, 352, 1897: "In great plenty in Riever Wood, which is a picturesque hanging wood on the north escarpment of the Chalk forming the south-west boundary of the county . . . in the locality given above it extends also into Wilts." The question arises: Was Dr Druce referring to Rivar Copse or Rivar Firs? At the time of his find (1890) both stations were in Berks and right on the border, but at the time of publication (1896-7) the Rivar

Firs station was well into Wilts. The Rivar Copse station seems to have been known well to botanists for many years; so it is very probable that that was where Dr Druce found it, and that the information was passed on. The statement that it extended into Wilts must therefore, I believe, be an error. The Rivar Firs station does not seem to have been recorded before 1936, and, I think, must constitute the first record for Wiltshire (*B.E.C. 1936 Rep.*, 268 (1937)).

Rather curiously, the map in *Fl. Berks* (1897) shows an older boundary than that in *Fl. Wilts* (1888).

Mr P. M. Hall (*B.E.C. 1936 Rep.*, 407 (1937)), mentions that there is similar uncertainty about the locality for *Chrysosplenium alternifolium* L. in this district. This species was first found by Mr C. P. Hurst in 1910 in the Berkshire portion of Rivar Copse. A search was made in 1937, and, with the help of notes kindly supplied by Mr Hurst, the plant was refound by Mr E. C. Wallace. The locality is unusual, and one would have thought hardly damp enough for the species. The altitude is about 800 feet, and associated plants are *Nepeta hederacea*, *Paris*, *Urtica dioica*, etc. Strangely, *C. oppositifolium* is absent.

A FURTHER CONTRIBUTION TO OUR KNOWLEDGE OF THE FLORA OF THE ISLE OF RAASAY (INNER HEBRIDES).

(Communicated by the DEPARTMENT OF BOTANY, King's College, University of Durham).

For three consecutive years, 1935, 1936 and 1937, expeditions have been dispatched from the Department of Botany, King's College, Newcastle-upon-Tyne, for the purpose of investigating the Flora and Fauna of the islands adjacent to Skye. During the first two years our efforts were concentrated on the Island of Raasay and its neighbours. As a result we were able to publish a "Flora of the Isle of Raasay and of the Adjoining Islands of South Rona, Scalpay, Fladday and Longay" (*Proceedings of the University of Durham Philosophical Society*, Vol. x, Part 5, pp. 260-304.)

In 1937, spurred on by the success of our earlier labours, we decided to transfer our attentions to the islands lying to the south of Skye, and therefore the Isle of Soay was selected as our centre. The work so begun was very successful, but, in view of its great promise and of the unique opportunities presented for its completion in 1938, when our headquarters will be fixed on the Isle of Rhum, no account will be published until later in the year.

After leaving Soay, we returned once again to Raasay to make a final attack on its phytogeographical problems. In addition, Eilean Tigh, an islet situated in Caol Rona, between Raasay and South Rona, was examined by Mr R. B. Cooke. During those researches many plants new to our lists were detected, and our knowledge of others materially extended. These results are set out in the present communication, and they are the product of the joint labours of Professor J. W. Heslop Harrison, D.Sc., F.R.S., Dr K. B. Blackburn, Miss E. Bolton, M.Sc., Miss H. B. Bond, B.Sc., Dr W. A. Clark, Mr Randle B. Cooke, Miss H. Heslop Harrison, M.Sc., and Miss B. Todd, B.Sc.

*=New record for v.-c. 104. ‡=New record for Raasay.

*NUPHAR LUTEA (L.) Sm., var. INTERMEDIA Aschers.—Abundant in a loch to the south-west of Brochel. The finding of its pollen grains at a considerable depth in the peat by the margin of the loch shows that it has been there for a very long time.

CORYDALIS CLAVICULATA (L.) DC.—To the two places previously mentioned can now be added a third locality near the mouth of the Storab Burn, and a fourth near Hallaig.

*COCHLEARIA ANGLICA L.—On the shore near Oskaig.

‡CERASTIUM VULGATUM L., var. ALPINUM Mert. & Koch—In a moist spot on the west side of Dun Caan.

STELLARIA HOLOSTEA L.—Further exploration has shown this to occur on the east side of the island, as well as on the west.

SPERGULARIA SALINA Presl—To the Oskaig and Screapadal records can now be added Eilean Tigh.

GERANIUM DISSECTUM L.—Also on dry ground which had at one time been under cultivation on Eilean Tigh.

ULEX EUROPAEUS L.—Looks even more certainly native on Eilean Tigh.

‡TRIFOLIUM MEDIUM L.—Very local near the shore to the south of Oskaig.

T. DUBIUM Sibth.—An occurrence near the Inverarish cottages supplements the two previous records.

ANTHYLLIS VULNERARIA L.—To the three previous places mentioned on the east side of the Island can now be added one on the west, viz., the raised beach near Oskaig, where var. *coccinea* L. prevails.

VICIA HIRSUTA (L.) S. F. Gray—Also north of Fearns.

DRYAS OCTOPETALA L.—Occurs south of the previously recorded localities on the cliffs above North Fearns.

AGRIMONIA ODORATA Mill.—A fourth habitat, about a mile north of Hallaig, may be added to the three mentioned in "The Flora."

SORBUS RUPICOLA Hedl.—Also on the cliffs near Hallaig, and on the cliffs above Loch a Chadhacharnaich.

‡SEDUM ACRE L.—Locally plentiful on the shingle near the shore at Eyre Point.

‡LYTHRUM SALICARIA L.—Not absent from Raasay as formerly supposed, but occurring on the Lewisian Gneiss near Arnish.

‡EPILOBIUM ALSINEFOLIUM Vill.—In a wet spot about one mile north of Dun Caan, at approximately 1000 feet. In Perth it is said to ascend to 3600 feet, and to descend to 400 feet in Eigg.

EPILOBIUM ANGUSTIFOLIUM L.—Also on the cliffs above North Fearns, and more abundant under Dun Caan than previously thought.

CONOPODIUM MAJUS (Gouan) Loret & Barr.—"Frequent in grassy places and often in birchwoods" would better describe this plant than the "not very plentiful" of "The Flora."

ANTHRISCUS SYLVESTRIS (L.) Hoffm.—In addition to the locality north of Inverarish it has been seen near the mouth of the Arish Burn.

LIGUSTICUM SCOTICUM L.—Further exploration has failed to reveal the presence of this species on the east side of the island, although on Eilean Tigh it is within a few hundred yards of that area.

‡ARTEMISIA VULGARIS L.—Close to some of the cottages at Balachuirn.

‡ARCTIUM VULGARE Hill, f. SUBTOMENTOSUM Evans (A. PUBENS Bab.).—On the cliffs between Screapadal and Hallaig. This form appears to be new to v.-c. 104.

‡HIERACIUM SHOOLBREDI E. S. Marshall—On the cliffs near Hallaig. Identified by Mr H. W. Pugsley.

H. ANGLICUM Fr.—Two extra stations are to be noted on the cliffs at Screapadal, and North Fearns.

‡CAMPANULA ROTUNDIFOLIA L.—Very rare and local; in Raasay House grounds, near the German cemetery, and on the cliffs about three miles north of Hallaig.

VACCINIUM VITIS-IDAEA L.—In addition to being on the top of Dun Caan, it is more widespread at 700 feet and over than "The Flora" indicates. It likes well drained peaty banks, is generally small, and rarely seems to fruit.

PYROLA SECUNDA L.—Several new colonies of this rare plant were detected in rocky fissures and on grassy slopes to the south-east of Dun Caan.

GLAUX MARITIMA L.—Our earlier remarks about the rarity of this species still hold good, although there are two new stations—near Brochel, and on Eilean Tigh.

*MICROCALA FILIFORMIS Hoffm. & Link—In 1937, growing with *Cicendia pusilla* and *Juncus capitatus* in a hollow along a tributary of the Arish Burn, one single plant was discovered. New to Scotland.

GENTIANA CAMPESTRIS L.—This has now been found in a number of new localities, and is known to extend to the north end of the Island.

DIGITALIS PURPUREA L.—Is not absent from the east side of the Island as formerly supposed.

EUPHRASIA BREVIPILA Burnat & Gremli—To the places previously named can be added—Oskaig, Hallaig and Arnish.

E. CONFUSA Pugsl. × E. BREVIPILA Burnat & Gremli—An additional locality is to be recorded near Hallaig.

‡E. CURTA Fr.—Near North Fearns and on the moors near Loch Storab. Identified by Mr H. W. Pugsley.

‡E. NEMOROSA (Pers.) Löhr—Near Dun Caan. Identified by Mr H. W. Pugsley.

‡E. GRACILIS Fr. × E. CURTA Fr.—What looks to be this hybrid occurs near Dun Caan.

PEDICULARIS PALUSTRIS L.—Thus can now be stated to be not as common as *P. sylvatica*, which is very abundant in damp places on the moors.

*LYCOPUS EUROPAEUS L.—Very rare and local by the shore about a quarter of a mile east of the pier, and at North Fearns; new to v.-c. 104.

×STACHYS AMBIGUA Sm.—This hybrid grows in the Raasay House kitchen garden.

LAMIUM PURPUREUM L.—To the "cultivated ground near Inverarish" can now be added—"ground which has at one time been cultivated on Eilean Tigh."

PLANTAGO MARITIMA L.—The previous records were all from shore localities, but now one can be given for exposed rocky ground a little to the north of Dun Caan at about 1000 feet, where it is very much dwarfed.

‡ATRIPLEX HORTENSIS L.—Near Churchton Bay.

‡A. GLABRIUSCULA Edmondst.—On the shingle at the mouth of the Storab Burn. This is the first record for Raasay, that in "The Flora" being for Rona.

‡SUAEDA MARITIMA Dum.—Very rare and local in the salt marsh south of Oskaig.

POLYGONUM HYDROPIPER L.—" The Flora " gives this as very rare for one station on Raasay, and commoner for one on Rona; it can now be described as not infrequent in and about cultivated ground from Arnish to Eilean Tigh.

P. CUSPIDATUM Sieb. & Zucc.—Established in a ruined cottage at the extreme north end of the Island.

‡OXYRIA DIGYNA Hill—Very local and rare on cliffs above Hallaig.

RUMEX CONGLOMERATUS Murr. (R. GLOMERATUS Schreb.).—Also by the shore at North Fearns.

‡SALIX AURITA L. × S. HERBACEA L.—An old plant of this rare hybrid was discovered on the cliffs south of Hallaig.

EPIPACTIS ATROPURPUREA Rafn.—Also on the cliffs above Hallaig.

ORCHIS LATIFOLIA L. (O. INCARNATA auct. non L.)—Also in marshy ground near the pier, and on the margin of a small loch, at about 550 feet, on a hill north east of Raasay House. Its flowers are pale pink in the former situation and deep rose pink in the latter.

GYMNADENIA CONOPSEA (L.) R. Br.—More widespread and abundant than the earlier account indicates. Very fine east of the pier and near Oskaig.

‡G. CONOPSEA (L.) R. Br. × ORCHIS PURPURELLA T. & T. A. Stephenson—At Oskaig Point.

COELOGLOSSUM VIRIDE (L.) Hartm.—Also locally plentiful on grassy ledges on the cliffs above Hallaig.

PLATANTHERA BIFOLIA (L.) Reichb.—To the previous stations can be added grassy places east of the pier.

‡JUNCUS BUFONIUS L., var. FASCICULATUS Koch—In the damp stony hollow where *J. capitatus* grows.

J. MACER S. F. Gray—Also near the Post Office.

‡J. BULBOSUS L., var. FLUITANS (Lam.) Druce—In some of the higher lochs and pools, where, when growing in two to three feet of water, it fails to flower, and only produces transparent submerged leaves.

‡POTAMOGETON PRAELONGUS Wulfen—Loch na Meilich to the west of Dun Caan.

CAREX PAUCIFLORA Lightf.—To be found above the right bank of the Arish Burn near Loch na Mna, and above Torran.

C. REMOTA L.—Also near North Fearns, and on the cliffs between Hallaig and Screapadal.

C. LIMOSA L.—A further station exists near Loch Storab.

C. SYLVATICA Huds.—On the cliffs near Hallaig.

C. HELODES Link—Also in the lower part of the gorge formed by the Storab Burn.

‡C. EXTENSA Good.—Very rare by the salt marsh south of Oskaig.

*MILIUM EFFUSUM L.—In a deep cleft in the cliffs above North Fearns.

DESCHAMPSIA CAESPITOSA (L.) Beauv.—A form with a blackish inflorescence was collected on the Raasay moors.

‡MOLINIA COERULEA (L.) Moench—In a form with beautiful golden flowers on the moors.

‡POA NEMORALIS L.—Rare in the woods around Raasay House.

‡BROMUS GIGANTEUS L.—In the same habitat as *Milium effusum*.

‡B. SECALINUS L.—Rare near Torran. [Add to *C.F.*; *Top. Bot.* says "counties all" but without giving details.—Ed.]

‡LOLIUM MULTIFLORUM Lam.—A casual, and probably an escape from cultivation, on field edges near Inverarish, and also on the beach between Eyre and Suisnish Points.

AGROPYRON CANINUM (L.) Beauv.—In the "Leek Gorge" near Balachuirn.

JUNIPERUS COMMUNIS L.—One plant on the cliffs of Screapadal.

POLYSTICHUM LONCHITIS (L.) Roth—Another station is on the limestone of the cliffs facing north above Hallaig; here it is locally plentiful.

DRYOPTERIS AEMULA (Ait.) O. Kuntze (LASTREA AEMULA Breckenridge)—Much more widespread and abundant than the earlier account indicates, and not confined to shady woods.

D. LINNAEANA Christ. (PHEGOPTERIS DRYOPTERIS Fée)—Less frequent in Raasay than formerly supposed.

D. PHEGOPTERIS (L.) Christ. (P. POLYPODIOIDES Fée)—Far from rare in a variety of situations on Raasay.

OSMUNDA REGALIS L.—To the one station for the east side of the Island two for the west can be added; others on the cliffs in Holoman Bay, and near the mouth of the Storab Burn.

BOTRYCHIUM LUNARIA (L.) Sw.—Many other places might be cited in addition to Oskaig Point station.

EQUISETUM TELMATEIA Ehrh. (E. MAXIMUM Lam.)—Also near Hallaig.

LYCOPODIUM CLAVATUM L.—Very local on the high ground south of the road between Inverarish and Fearns.

FURTHER BOTANISING IN THE OUTER HEBRIDES.

M. S. Campbell, F.L.S.

In 1937 I was able to make another visit to the Outer Hebrides, and as most of the ground covered was new to me it seems desirable to give a detailed list of the vascular plants and Characeae collected. In order to avoid any possible confusion which might arise from the frequent recurrence of similar place names:—e.g., several lochs in Harris are named Langavat—an account of the principal places included in the tour is given.

On the evening of June 25th my brother and I arrived at Stornoway in the Island of Lewis. The approach to the harbour was particularly remarkable for the large bushes of *Rhododendron ponticum* in full bloom and the vast plantation of trees which forms the background to the Castle. The next morning we set out by car for the Butt of Lewis and before coming to the end of the road a stop was made at Lionel, near Port of Ness. Various plants were also gathered on the cliff tops near the Lighthouse, including a belated flowering specimen of *Scilla verna*. We then turned westward and south and drove via Barvas and Bragor to Carloway, where we went down to the harbour, and from there returned to Stornoway.

On the 27th we took the road southward and entered North Harris, collecting at various places near the road, which runs through fine wild and partly very hilly country, with occasional tracts of cultivation surrounding the villages. Tarbert was reached in the afternoon, early enough to permit of some exploring in the neighbourhood. The next day was spent in South Harris, which gave me the opportunity of revisiting Rodel, and in the evening we embarked on the "Lochmor" for North Uist.

On July 2nd Messrs F. Druce and A. J. Wilmott joined us at Newton Lodge (N.U.) and on the days which followed various expeditions were made, the longest of which was to Eaval, an isolated hill of 1138 ft. which is almost as its name suggests, an island. We approached from Locheport, where we were lucky enough to secure and board a motor boat a few moments before the ebbing tide would have made it impossible to get off. We went some distance down the loch—an arm of the sea—and landed, with difficulty, on a rocky, wrack-covered shore and proceeded on foot, over peat-hags and by the shores of (fresh water) Loch Obisary, to the slopes of the hill. The rocks below the summit on the north side were examined and various plants collected. The return to the boat was made by the east side of Burrival. An evening's fishing on Loch an Duin yielded a quantity of *Ruppia spiralis* in beautiful condition.

On July 9th we left Newton Ferry (Port nan Long, on Ordnance map) by motor boat and crossed the Sounds of Berneray and Harris in perfect weather, though the low tide and an abundance of *Laminaria* and other seaweed made landing at Rodel a very slippery business. A

night was spent at Rodel to enable Mr Druce and Mr Wilmott to view the *Antennaria* " *hyperborea*," and the following afternoon, after visiting St Clement's Church—an interesting " Ancient Monument "—we drove in slow stages to Tarbert (N.H.). On July 11th, a day of sunshine and brilliant blue colouring, we set out for Amhuinnsuidh, and through the kindness of Sir Samuel Scott we were able to search for *Carex* " *spiculosa*." Afterwards we went on to where the road ends at Husinish—a place of considerable beauty, opposite the island of Scarp, where W. S. Duncan did much of his collecting. In the evening we drove along the north side of East Loch Tarbert to Carnach, opposite Scalpay, and were rewarded by magnificent sunset views and an interesting list of plants.

On July 13th, after a scramble on the lower rocks of Tomnaval in the Forest of Harris, we reached Stornoway, and the next day set out early for the west side of Lewis, going via Carloway to Callanish. Here, magnificently situated on a promontory overlooking Loch Roag, close to Great Bernera, are some remarkable standing stones, reminiscent of those at Stonehenge. We returned to Stornoway by Garynahine and late the same evening left by the " Lochness " for Kyle of Lochalsh.

As much has already been written by others regarding the nature of the country, it is superfluous for me to enter into details. The east side of the islands is mostly wild, rocky, and boggy, but the western side usually presents a green and gentler aspect with considerable dune country, frequently with " sheen white sands." The few salt-marshes are mainly composed of *Armeria*, which, when in flower, colours the inlets pink. Other normal salt-marsh species occur, though more rarely than further south, and often as small forms (e.g. *Aster Tripolium*, " var. *arcticum*," *Juncus Gerardi*, var. *salsuginosus*), but Mr Wilmott thinks these are probably only states, as other species (e.g. *Juncus bulbosus*, *Triglochin maritimum*) take on similar peculiar looking forms. On the broad sandy flat north of Northton (S.H.) at the seaward edge of vegetation, similar peculiar small forms were found, e.g., of *Triglochin maritimum* as well as of *Juncus Gerardi*.

With the exception of supplementary material confirming vice-county records, etc., all plants in the following list are from localities other than those mentioned last year. There are ten plants starred as new county records. It is difficult to be certain of their not having been previously published, though they have been checked up by all Outer Hebridean literature so far known to me. Some of these records have been the result of collecting done by my brother (J.W.C.) during other visits. His help in obtaining supplementary material and information has been invaluable. A separate list of these species not included in the *Comital Flora* for v.-c. 110, but which in reality are not new records, is again added.

To Mr Wilmott I tender most grateful thanks for without his assistance and co-operation it would not have been possible to produce this paper. A large proportion of the field work was done by him as well as

most of the critical determinations and the extensive notes on Orchis, etc. He has also provided the photograph for the plate.

In addition, I wish to thank Mr Druce for his energetic help in the field, and the following for critical determinations:—Dr W. O. Howarth, Dr G. Taylor, Colonel A. H. Wolley-Dod, Messrs G. O. Allen, A. H. G. Alston, G. M. Ash, J. E. Dandy, J. E. Lousley, W. R. Philipson, H. W. Pugsley, and A. L. Still.

Initials in parentheses indicate those responsible for determinations and notes preceding them.

Abbreviations used are the same as those in my previous paper (*B.E.C. 1936 Rep.*, 304 (1937)) with the following additions:—F.D.= Francis Druce. J.E.D.=J. E. Dandy. L.=Lewis. N.H.=North Harris. W.R.P.=W. R. Philipson.

All specimens were collected either by Mr Wilmott or myself unless otherwise stated and have been deposited in Herb. Mus. Brit.

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2/2. THALICTRUM MINUS L., sensu lato.
N.H.: Sand hills, Husinish. "All the specimens collected here are of the less glandular form mentioned last year, and are probably *T. montanum* Wallr., though fruits are required for confirmation." (W.)

2/5. THALICTRUM ALPINUM L.
N.H.: Tomnaval.

6/3. RANUNCULUS ACER L.
"Several series were collected in S.H., N.H. and L., in addition to further gatherings in N.U. Some of the small states are probably f. *borealis* Trautv. The fine large form from N.H.: rock ledges below Tomnaval is probably *R. Steveni* Andrz., ex Bess. (*Fl. Exs. Austr.-Hung.*, 1720, form 2)." (W.)

6/7. RANUNCULUS FLAMMULA L.
N.H.: Near Tolmachain. L.: Butt of Lewis.

6/23. RANUNCULUS PAUCISTAMINEUS Tausch.
N.U.: Shallow loch, east of Loch Scarie; Loch a' Chaolais (coll. J.W.C.). L.: Lionel. (W.).

6/32. RANUNCULUS HEDERACEUS L.
L.: Swanibost.

6/33. RANUNCULUS FICARIA L.
N.U.: West side of Burrival. S.H.: Borosdale near Rodel.

7/1. CALTHA PALUSTRIS L.
"A plant with 6 sepals from N.H.: Husinish (more or less normal form with overlapping lobes to lower leaves and shallow crenate leaves; petals narrow). This group requires further study. The following have the subtriangular and deeply crenate leaves characteristic of *C. radicans* Forster. N.U.: Near Newton. S.H.: Nisibost. L.: Lionel.
A small form resembling the variety *minor* occurs in N.U.: Dune marsh near Newton." (W.).

19/1. NUPHAR LUTEUM (L.) Sm.
N.U.: Loch Fada (coll. A. MacCuish). First recorded from N.U. by Macgillivray, 1830, and subsequently confirmed by Shoolbred (*J.B.*, 1895, p. 239; *A.S.N.H.*, 1895, p. 117) who noted it as "in some plenty in several of the smaller lochs on the East side." I have so far failed to find it or hear of it other than in Loch Fada where I am told it is scarce.

20/1. NYMPHAEA ALBA L.
N.U.: Loch by Lochmaddy road near Cringravel. (W.)

20/1c. NYMPHAEA OCCIDENTALIS (Ost.) Moss.
N.U.: In the same locality as *N. alba* and also Loch Creige. L.: Loch Soval. (W.)

21/3. PAPAVER DUBIUM L., em. Lamotte.
N.U.: By Newton Lodge; near Balelone. (W.)

32/9. FUMARIA BASTARDI Bor.
N.U.: Newton (coll. J.W.C.); Balelone; bare patch cut for turf, inside Clachan dunes; east of Loch Scarie (coll. F.D.). (W.)

35/1. NASTURTIUM OFFICINALE R. Br.
N.U.: Near Newton.

39/1. CARDAMINE PRATENSIS L.
N.U.: Near Grenetote, towards Geireann. L.: Lionel.

39/5. CARDAMINE HIRSUTA L.
N.U.: Slopes of Eaval. N.H.: Scree slope below Tomnaval. (W.)

45/6. COCHLEARIA GROENLANDICA auct. angl. (vix L.).
N.U.: Loch Eport, opposite Burrival. L.: Butt of Lewis.

75/1. CRAMBE MARITIMA L.
N.U.: Eilean a' Mhorain (coll. J. A. Nicholson and A. MacAskill). Sea Kale was noted in N.U. by D. C. Burlingham of King's Lynn who visited the Outer Hebrides in June 1848. In the obituary notice written by C. B. Plowright (*Trans. Norf. Norw. Nat. Soc.*, 1902, *7*, 416) the following verbatim extract from Burlingham's note book is given:—" 1st day:—(Sunday) Went to the head of the Loch (Loch Maddy) over sand, 2 miles —Ring Doterell numerous—saw several Eider ducks—small flock of birds I suppose they were Stints, could not tell. Plants: —Sea-Kale, *Viola lutea*, *Glaux maritima*, *Arenaria peploides*, Scurvy grass." . . . Arthur Bennett states (*A.S.N.H.*, 1905, 166):—" By the kindness of Dr Plowright I have ascertained that there is no specimen in his herbarium." My brother (J.W.C.) when in N.U. last autumn was told of the occurrence of Sea Kale on Eilean a' Mhorain and on hearing that Dr Nicholson and A. MacAskill were going over to the island, asked them to obtain specimens. Local tradition is that the plant was introduced years ago as the result of a wreck near this wee island. It is known to have been growing there for " years back " (well over 100 years) and is reputed to be increasing. Eilean a' Mhorain is situated off the north coast of N.U. between Ard a' Mhorain and Boreray, which scarcely answers Burlingham's description, but as far as my brother could ascertain this is the only known locality in N.U.

77/1. CAKILE MARITIMA Scop.
N.U.: Near Newton.

80/1c. RAPHANUS RAPHANISTRUM L., var. nov. AUREUS Wilmott: petalis aureis venis concoloribus.
N.U.: Newton. N.H.: West of Tarbert. "I have been unable to find a name for the form of this species which is abundant and, so far as I have observed, uniform in the North of Scotland, i.e. in the Outer Hebrides (cf. previous paper, 307), Skye, W. Ross, Aberdeenshire (Cockbridge; Braemar) and Perthshire (S. of Spital of Glen Shee). I therefore describe it as a new variety, although its uniformity and distinct distribution may indicate that it is really a subspecies. It is apparently not *Raphanistrum Lampsana* α *sulfurea* F. Gérard (1890: *Rev. Bot. Soc. Fr. Bot.*, 8, 55), which is described as having flowers yellow, veined with yellow and not with violet, for Gérard cites as synonym *R. segetum* Rchb. Fl. Germ. Exc., p. 656, and that is described as with flowers like those of *Brassica oleracea* but smaller. The flowers of var. *aureus* could be described as like those of the Turnip but larger, for the colour is the golden yellow of Buttercups and Potentillas, and not sulphur yellow as in the Cabbage. It is not the var. *flavus* (S. F. Gray, 1821: *Nat. Arr.*, II, 688: "petals yellow, veined with black") Schreb. & Mart. (1834: *Fl. Wurtemb.*, 415) see *1935 Rep.*, 169. Since writing the above I have received var. *aureus* from the I. of Man (Ramsey, coll. C. I. Paton, 1937)." (W.)

88/4. VIOLA RIVINIANA Rchb.
N.U.: Middle rocks, Eaval. N.H.: Carnach; scree below Tomnaval. L.: **Near Carloway. (W.)**

88/6. VIOLA CANINA L. em. Rchb.
N.U.: Suenish, near Newton. (W.)

88/11. VIOLA PALUSTRIS L. N.U.: Lower rocks, North side of Eaval. N.H.: Scaladale.

88/24. VIOLA ARVENSIS Murr., var. OBTUSIFOLIA (Jord.).
N.U.: By Newton Lodge. (W.)

88/34. VIOLA CURTISII Forster.
N.U.: Fixed dune, near Newton; fallow field, Balelone. (W.)

89/1. POLYGALA SERPYLLIFOLIA Hose.
N.U.: Between Burrival and Eaval. The following with pink flowers—S.H.: Borosdale, near Rodel. N.H.: Below Tomnaval; Carnach. (W.)

89/2. POLYGALA VULGARIS L.
N.U.: Newton Ferry; fixed and outer dunes, near Newton. N.H.: Husinish. L.: Balallan; grassy slope, Carloway. (W.)
"The only constant character which I have so far found to separate *P. oxyptera* from *P. vulgaris* is the small size of the flower: every other character—pale colours, shorter sepal narrower than the fruit, narrower leaves, habit, and so on—all may break down although most of them are present in all specimens. In the Outer Hebrides the separation is more diffi-

cult than usual, for not only is the difference in flower size less obvious but the small flowers are more often deep coloured than pale, the habit is variable and the leaves sometimes broadish. Having seen these deep coloured small flowered forms presumably referable to *P. oxyptera*, I would refer the rich "red" flowered plant from Sollas (noted last year: *B.E.C. 1936 Rep.*, p. 307; 89/2) to *P. oxyptera* owing to its small flowers.

89/4. POLYGALA OXYPTERA Rchb.
N.U.: Suenish, near Newton, growing flat on a bare denuded slope: an unusual habitat. Some are *P. oxyptera* but whether all I am uncertain: in spite of differences they seemed in the field to be all one kind. Newton Ferry (same locality as noted last year). S.H.: Borosdale, near Rodel; near Seilebost. L.: Grassy slope, Carloway: the flowers are smaller, but not pale coloured; Lionel—? *P. oxyptera* by the small flowers, but leaves broad and colour deep." (W.)

96/1. SILENE MARITIMA With.
L.: Butt of Lewis.

98/3. MELANDRYUM ALBUM (Mill.) Garcke.
N.U.: Cultivated field, Scolpaig.

100/5. CERASTIUM VULGATUM L. (C. TRIVIALE Link).
N.U.: Lingay Strand. S.H.: Near Rodel. N.H.: Scree slope below Tomnaval. L.: Butt of Lewis. (W.)

100/6. CERASTIUM VISCOSUM L., var. CONFERTUM (R. & F.) Druce.
N.H.: Husinish. L.: Lionel. (W.)

100/6c. CERASTIUM VISCOSUM L., var. ELONGATUM (R. & F.) Druce.
N.U.: Newton Ferry. S.H.: Nisabost. (W.)

100/9. CERASTIUM TETRANDRUM Curt.
N.U.: Fixed dune, near Newton; Lingay Strand. (W.)

101/3. STELLARIA MEDIA (L.) Vill.
N.U.: By Newton Lodge; in a track through heather, north of Burrival. S.H.: Nisibost. N.H.: Carnach.

102/5. ARENARIA SERPYLLIFOLIA L.
N.U.: Suenish; near Newton; sandy slope, Lingay Strand. S.H.: Nisabost; dunes and potato patch.

103/10. SAGINA MARITIMA Don.
L.: Butt of Lewis. (W.)

103/11. SAGINA PROCUMBENS L.
N.U.: Ahmore Strand; shaded niche, Beinn Bhreac; Lochmaddy. N.H.: Husinish; below Tomnaval. L.: Carloway. (W.)

104/1. SPERGULA ARVENSIS L., em. Rchb.
N.U.: Trumisgarry. N.H.: Near Carnach. L.: Carloway. (W.)

105/2. SPERGULARIA MARGINATA (DC.) Kittel.
N.U.: South of Clachan, near Trumisgarry.

105/3. SPERGULARIA SALINA Presl.
L.: Salt marsh near Callanish; Butt of Lewis. (W.)

109/1. MONTIA FONTANA L., var. LAMPROSPERMA (Cham.) Fenzl.
N.U.: Between Burrival and Eaval; near Newton, towards Beinn Bhreac. L.: By the river Carloway; Balallan. (W.)

112/9. HYPERICUM PULCHRUM L.
N.U.: Above Newton towards Beinn Bhreac; near Loch an Duin; by Loch na Morgha. L.: Near Callanish.

125/3. LINUM CATHARTICUM L.
N.U.: Dunes near Newton; sandy slope, Lingay Strand. S.H.: Near Seilebost. L.: Lionel.

127/9. GERANIUM DISSECTUM L.
N.U.: By Newton Lodge.

127/10. GERANIUM MOLLE L.
N.U.: Fallow field, Balelone. L.: Lionel.

128/3. ERODIUM CICUTARIUM (L.) L'Hérit.
N.U.: By Newton Lodge (coll. F.D.), seems to agree with *E. Lebelii* Jord., Salm. & Baker, *J.B.*, *58*, 125-6, 1920. (W.)

132/1. OXALIS ACETOSELLA L.
N.H.: Wet scree below Tomnaval.

149/1. ULEX EUROPAEUS L.
N.U.: "Confined to the dyke boundary to North-west of Beinn Mhor: probably planted." (W.)

*†153/3. MEDICAGO SATIVA L.
N.U.: Newton (coll. and det. J.W.C.).

153/7. MEDICAGO LUPULINA L.
N.U.: Newton (coll. J.W.C.), larger specimen confirming last year's record.

155/1. TRIFOLIUM MEDIUM L.
L.: Near Breasclete; Carloway.

155/2. TRIFOLIUM PRATENSE L.
N.U.: Semi-fixed dune, near Newton; Suenish, near Newton. N.H.: Husinish. L.: Carloway (coll. F.D.); Lionel.

155/16. TRIFOLIUM REPENS L.
L.: Butt of Lewis.

156/1. ANTHYLLIS VULNERARIA L.
N.U.: Fixed dune, near Newton; Scolpaig. N.H.: Husinish. L.: Lionel; Butt of Lewis.

Var. VILLOSA Corb. ? N.U.: Newton. "The form (with spreading hairs on the stem, especially below) is locally abundant, but whether Corbière would have referred it to var. *villosa* or *A. maritima*, var. *sericea* Bréb. is uncertain, for in a large series one plant only was observed without anthocyan in the calyx: some plants were erect, some were spreading, some have broader leaflets than others." (W.)

160/5. LOTUS CORNICULATUS L.
S.H.: Nisibost; Northton. N.H.: Husinish; Carnach. L.: Butt of Lewis.

176/3. VICIA CRACCA L.
N.U.: By Newton Lodge. N.H.: Husinish.

178/6. LATHYRUS PRATENSIS L.
N.U.: South-west of Clachan, near Reumisgarry.

184/11. SPIRAEA ULMARIA L.
S.H.: Borosdale near Rodel.

185. RUBUS FRUTICOSUS L., sensu lato.
Specimens yet undetermined critically were collected in: N.U.: Beinn Bhreac; west side of Burrival; Newton (coll. J.W.C.).

189/3. POTENTILLA ANSERINA L. (var. VULGARIS Hayne).
N.U.: Outer dunes, near Newton. S.H.: Near Seilebost. L.: Butt of Lewis. (W.)

189/3d. POTENTILLA ANSERINA L., var. SERICEA Hayne (var. CONCOLOR Wallr.).
N.U.: Dune slack, near Newton; Suenish. (W.)

189/25. COMARUM PALUSTRE L.
L.: Near Callanish.

190/19. ALCHEMILLA ALPINA L.
N.H.: Lower rocks of Tomnaval.

190/20. ALCHEMILLA ARVENSIS (L.) Scop.
N.U.: By Newton Lodge; Trumisgarry.

194. ROSA.
A number of roses were collected and have been seen by Colonel Wolley-Dod, who finds some of them to be unlike any he has so far seen in Great Britain. He has named a gathering from S.H.: near Rodel Hotel, "*R canina* L., group *Transitoriae*, var. *spuria* (Pug.) W.-Dod. Most interesting from so far north." Mrs Corstorphine, who saw them afterwards, agrees with this determination and has named the following:—

194/6a. R. CANINA L., var. LUTETIANA (Lem.) Baker.
S.H.: Borosdale, near Rodel (petals rose-coloured).

194/20b. R. SHERARDI Davies, var. TYPICA W.-Dod.
N.U.: Beinn Bhreac.

194/20c. R. SHERARDI, f. PSEUDOMOLLIS W.-Dod.
N.U.: Upper Loch an Armuinn (coll. J.W.C.). "The sepals are not sufficiently appendiculate for typical *Sherardi*, but the curved prickles are against *mollis*."

194/21. R. MOLLIS Sm.
S.H.: Borosdale, near Rodel.
L.: at and between Carloway and Breasclet.
It is hoped that further material may be collected when the plants are fruiting, but good specimens are difficult to obtain as flowers are somewhat infrequent.

195/5. SORBUS AUCUPARIA L.
N.U.: Beinn Bhreac. N.H.: In a gully below Tomnaval.

199/23. SAXIFRAGA STELLARIS L.
N.H.: Scree slope and rocks below Tomnaval.

211/6. SEDUM ACRE L.
S.H.: Northton.

211/22. SEDUM RHODIOLA DC.
N.H.: Rocks below Tomnaval.

213/1. DROSERA ANGLICA Huds.
N.U.: By Loch Eik. N.H.: Above Loch Langavat (near Husinish). L.: Loch Soval.

213/3. DROSERA ROTUNDIFOLIA L.
L.: Loch Soval.

214/1. HIPPURIS VULGARIS L.
N.U.: Loch Veiragvat (coll. J.W.C.).

216/1. MYRIOPHYLLUM SPICATUM L.
N.U.: Shallow loch, east of Loch Scarie.

216/2. MYRIOPHYLLUM ALTERNIFLORUM DC.
N.U.: Loch a' Chaolais (coll. J.W.C.). L.: Loch by the school, 2 miles south of Carloway. (W.)

217/1. CALLITRICHE STAGNALIS Scop. sec. Kütz.
N.U.: Near Newton; south west of Clachan, near Reumisgarry.
S.H.: Borosdale, near Rodel. (W.)

217/5. CALLITRICHE INTERMEDIA Hoffm. (C. HAMULATA Kütz.).
N.U.: Newton Lodge; stream between Burrival and Eaval.
L.: Loch by the school, 2 miles south of Carloway. (W.)

218/1. PEPLIS PORTULA L.
N.U.: Pond by Newton Lodge.

220/7. EPILOBIUM OBSCURUM Schreb.
N.U.: Roadside bank, near Trumisgarry; near Sponish (det. G. M. Ash).

220/14. EPILOBIUM PALUSTRE L.
N.U.: Slopes of Eaval (det. G. M. Ash). N.H.: Carnach (G. M. Ash agrees with this determination).

237/1. HYDROCOTYLE VULGARIS L.
L.: Butt of Lewis.

*254/1. AEGOPODIUM PODAGRARIA L.
N.U.: By Newton Lodge. Although included in *Comital Flora* for v.-c. 110 I have so far found no published record. The following extract from a letter written by W. S. Duncan, dated 18/10/95, included in Herb. Bennett (cover 1686**) is therefore of interest:—"I don't know if you have *Aegopodium Podagraria* recorded for these islands. My first sight of it in Harris was in a garden in the Summer of '94, and a day or two after I saw it in a field at Tarbert. I found it again in the same field a few weeks ago."

256/1. CONOPODIUM MAJUS (Gouan) Loret & Barr.
N.U.: Near Sponish suspension bridge. Specimen collected in fruit, confirming last year's record.

274/1. ANGELICA SYLVESTRIS L.
N.U.: Loch na Morgha (coll. J.W.C.); lower main rocks, north side of Eaval.

282/1. Daucus Carota L.
N.U.: By Newton Lodge.

291/2. Lonicera Periclymenum L.
N.U.: Beinn Bhreac.

296/4. Galium saxatile L.
N.U.: Slopes of Eaval. L.: Roadside, 2 miles south of Carloway.

296/7. Galium palustre L.
N.U.: Near Newton. S.H.: Borosdale, near Rodel. (W.)

296/9. Galium verum L.
S.H.: Nisibost; near Seilebost. L.: Carloway.

301/1. Valeriana officinalis L.
S.H.: Borosdale, near Rodel.

304/1. Valerianella Locusta (L., em.) Betcke.
N.U.: Knoll on Clachan dunes, near Newton. (W.)

312/1. Solidago Virgaurea L.
N.U.: Lower main rocks, north side of Eaval; Beinn Bhreac.
N.H.: Lower rocks, Tomnaval. (W.)

314/1. Bellis perennis L.
N.U.: Mobile dunes, near Newton. L.: Butt of Lewis.

318/19c. Aster Tripolium L., var. arcticus Th. Fr.
N.U.: Head of Oban Trumisgarry. "Similar plants are in Herb. Mus. Brit. from E. Ross (Tain: Marshall 1890) and Orkney (Oyce at Firth: Boswell 1880), but others from the same Orkney locality are larger: in addition some from Guernsey are very like the "var. *arcticus*." Transplant experiments are therefore much needed, as although the extreme form looks very remarkable in the field, it may be merely a state due to exposure to oceanic winds." (W.)

326/1. Antennaria dioica (L.) Gaertn.
N.U.: Suenish, near Newton. S.H.: Rudha Romagi (coll. J.W.C.). N.H.: Above Loch Langavat (near Husinish), some with leaves moderately silky-hairy above. L.: Balallan.

365/1. Achillea Millefolium L.
N.U.: Newton (coll. J.W.C.). S.H.: Borosdale, near Rodel. L.: Carloway.

368/4. Anthemis Cotula L.
N.U.: Trumisgarry.

370/1. Chrysanthemum segetum L.
N.U.: Balelone. Very abundant in fields throughout the west side and particularly in this district.

370/4. Chrysanthemum Leucanthemum L.
N.U.: Newton; near Lochmaddy.

371/1. Matricaria inodora L.
N.H.: Carnach. (W.)

378/3. Artemisia vulgaris L.
L.: Carloway.

379/1. TUSSILAGO FARFARA L.
N.U.: Newton (coll. J.W.C.).

380/1. PETASITES HYBRIDUS (L.) G.M.S., em. Fritsch.
L.: Lionel.

383/5. SENECIO JACOBAEA L.
N.U.: Outer dune, near Newton.

396/9. CIRSIUM PALUSTRE (L.) Scop.
N.U.: Slopes of Eaval.

*405/13. CENTAUREA SCABIOSA L.
N.U.: Newton (coll. J.W.C., det. M.S.C.).

411/1. LAPSANA COMMUNIS L.
N.H.: Carnach.

416/5h. CREPIS CAPILLARIS L., var. GLANDULOSA Druce (var. ANGLICA Druce & Thellung).
N.U.: Near Newton. L.: Wall top, Carloway. "Druce cites var. *glandulosa* as 'nomen,' but it is not, for the characters are definitely stated. Although without Latin definition, the name is valid by decision of the 1930 International Congress, and must be given preference over that of *anglica*." (W.)

419. HIERACIUM L.
Many gatherings were made in N.U., S. and N.H. and L., but as the genus is at present undergoing revision, no attempt has been made to list them. When Mr Pugsley is ready I hope to submit them to him for critical determination.

422/2. LEONTODON AUTUMNALIS L.
N.H.: Scree slope below Tomnaval. L.: Roadside, 2 miles south of Carloway. (W.)

423. TARAXACUM Zinn.
"Several forms were collected but cannot yet be named. N.U.: Dunes near Newton; bare sand, Clachan near Reumisgarry. S.H.: Northton. N.H.: Gully of Tomnaval. On the dunes it was almost impossible to find flower or fruit as they had been uniformly eaten off." (W.)

427/2. SONCHUS ARVENSIS L.
N.U.: Newton (coll. J.W.C.).

427/3. SONCHUS ASPER Hill.
N.U.: By Newton Lodge.

431/1. LOBELIA DORTMANNA L.
N.U.: Loch Eik. S.H.: Near Rodel. N.H.: Near Ard an Tolmachain.

435/5. CAMPANULA ROTUNDIFOLIA L.
N.U.: Clachan dunes, near Newton.

438/2. VACCINIUM MYRTILLUS L.
N.U.: Slopes of Eaval. N.H.: Scree slope below Tomnaval; Carnach.

445/1. CALLUNA VULGARIS Hull.
N.H.: Scaladale.

446/2. ERICA TETRALIX L.
N.U.: Between Beinn Mhor and Beinn Bhreac, with white flowers.

458. ARMERIA Willd.
"Abundant throughout by the sea, this is the dominant plant of the salt-marshes, and when in flower turns them to sheets of colour. The leaves are generally narrow, the flowers deep-coloured and the calyx glabrous between the ribs, but the last character seems to be inconstant, even on the same stock, head, or calyx (on opposite sides), and long-leaved, broad-leaved, and pale-flowered forms occur." (W.)

460/2. PRIMULA VULGARIS Huds.
N.U.: Beinn Bhreac; slopes of Eaval.

466/1. GLAUX MARITIMA L.
N.U.: Ahmore Strand; south of Clachan, near Trumisgarry. L.: Salt marsh near Callanish; Butt of Lewis.

467/2. ANAGALLIS ARVENSIS L.
N.U.: Cultivated field, Scolpaig.

478/1. ERYTHRAEA CENTAURIUM Pers.
N.U.: Lingay Strand; Trumisgarry; Suenish, near Newton. S.H.: Borosdale near Rodel. N.H.: Husinish. "The prevailing form is simple stemmed, about 4 in. high, with a single moderately congested capitulum. The basal leaves are not normally unusually large and broad, and the ribs on the base of the calyx and on the pedicels are scabridulous. I cannot separate them into the varieties described by Wheldon & Salmon (*J.B.*, *63*, 345-346, 1925). (W.)

480/9. GENTIANA CAMPESTRIS L.
N.U.: Sandy slope, Lingay Strand. S.H.: Traigh Nisabost. N.H.: Husinish. L.: Carloway. (W.)

*497/1b. SYMPHYTUM OFFICINALE L., var. PATENS (Sibth.).
N.U.: By Newton Lodge (coll. J.W.C. and later W., who determined it).

501/1. LYCOPSIS ARVENSIS L.
N.U.: By Newton Lodge.

506/3. MYOSOTIS REPENS [Don ined.] Rchb.
S.H.: Borosdale, near Rodel; near the sluice by the loch above Rodel hotel. (W.)

506/4. MYOSOTIS CAESPITOSA F. Schultz.
N.U.: Near Newton; Scolpaig; South-west of Clachan, near Reumisgarry. S.H.: Borosdale, near Rodel. N.H.: Tarbert. L.: Swanibost; roadside ditch near Carloway; Lionel. (W.)

The specimen from "N.U.: Newton, marsh below garden," listed last year as *M. repens*, has been referred to *M. caespitosa* by Mr A. E. Wade.

506/8. MYOSOTIS ARVENSIS (L.) Hill.
N.U.: Balelone; outer dunes, near Newton. (W.)

506/10. MYOSOTIS VERSICOLOR Sm.
N.U.: By Newton Lodge. S.H.: Near the sluice by the loch above Rodel hotel. N.H.: Carnach (coll. F.D.). L.: Carloway.

*†537/1. MIMULUS GUTTATUS DC., var.
L.: Lionel, in some quantity by the side of a small burn. The corolla lobes were a rich bronze colour, flowers large (coll. M.S.C., det. W.).

541/1. DIGITALIS PURPUREA L.
N.U.: Slope below lower main rocks, north side of Eaval; scarce on west side of Burrival.

543/3. VERONICA OFFICINALIS L.
N.U.: Slopes of Burrival; near Grenetote, towards Geireann. N.H.: Slopes below Tomnaval. L.: Roadside, 2 miles south of Carloway.

543/4. VERONICA CHAMAEDRYS L.
N.U.: By Newton Lodge.

543/6. VERONICA SCUTELLATA L.
L.: Loch Soval; roadside near Carloway.

543/8. VERONICA ANAGALLIS-AQUATICA L.
N.U.: Ditch, near Newton. L.: Swanibost. (W.)

543/11. VERONICA SERPYLLIFOLIA L.
S.H.: Near Rodel.

543/15. VERONICA ARVENSIS L.
N.U.: By Newton Lodge. S.H.: Wall, Rodel.

545. EUPHRASIA L.
All gatherings have been submitted to Mr Pugsley who has named or confirmed the following:—

545/3. EUPHRASIA BREVIPILA Burn. & Grem.
S.H.: Near Rodel; Borosdale. L.: Carloway.

545/3b. EUPHRASIA BREVIPILA Burn. & Grem., f. SUBEGLANDULOSA Bucknall.
S.H.: Traigh Nisabost.

545/5e. EUPHRASIA NEMOROSA Löhr, var. SABULICOLA Pugsl.
N.U.: Fixed dune, near Newton.

545/13. EUPHRASIA FOULAENSIS Towns.
L.: Butt of Lewis.

545/15. EUPHRASIA MICRANTHA Rchb.
N.U.: Alioter (W., "Yes, with very small flowers," H.W.P.). S.H.: Near Rodel (W., "Yes, very untypical," H.W.P.). N.H.: Scaladale.

Specimens from N.U.: Near Lochmaddy; by Loch Eik; Clachan dunes, near Trumisgarry. N.H.: Carnach. L.: Near Callanish; near Carloway are probably *E. brevipila* B. & G. A gathering from L.: Lionel "looks like *E. Marshallii* Pugsl. but is too young for certainty," and another from L.: Near Callanish, is possibly *E. foulaensis* Towns.

547/1. PEDICULARIS PALUSTRIS L.
N.U.: By Loch Eik. L.: Lionel; roadside near Carloway.

547/2. PEDICULARIS SYLVATICA L.
N.U.: West side of Burrival. L.: Butt of Lewis.

548/3. RHINANTHUS MINOR Ehrh.
N.U.: By Newton Ferry; Scolpaig. L.: Lionel. (W.)

548/5. RHINANTHUS STENOPHYLLUS (Schur) Druce.
N.U.: South-west of Clachan, near Reumisgarry—"rigid and brittle: flowers quite yellow: stems vittate;" Scolpaig. S.H.: Church ridge, Rodel—"some with yellow calices but plant with some anthocyan; others with redder calyx." N.H.: Carnach; Husinish—"leaves more like *R. minor*, but intercalary leaves 1 or 2." L.: Carloway; near Callanish; near Breasclete. (W.)

548/6. RHINANTHUS MONTICOLA (Sterneck) Marshall.
N.U.: Margin of dune slack, near Newton. (W.)

552/4. UTRICULARIA "OCHROLEUCA" auct. angl.
N.H.: Scaladale; near Ard an Tolmachain (coll. J.W.C.). (W.)

552/5. UTRICULARIA MINOR L.
N.H.: Near Ard an Tolmachain (coll. J.W.C.). L.: Aird an Troim. (W.)

553/4. PINGUICULA LUSITANICA L.
N.U.: Near Newton, towards Beinn Bhreac; edge of Ahmore Strand (coll. J.W.C.); west side of Burrival. S.H.: Near Rodel.

*558/2. MENTHA ALOPECUROIDES Hull.
N.U.: Boreray (coll. J.W.C., det. A. L. Still).

558/7. MENTHA AQUATICA L.
N.U.: Dune slack, near Newton. (W.) Mr Still agrees with the determination.

561/4. THYMUS SERPYLLUM L.
"The forms of this aggregate species are inadequately described by Ronniger (*B.E.C. 1923 Rep.*), and the mere use of the key brings together diverse looking plants and separates others more similar. The specimens to which he has himself given the same name are often extraordinarily diverse, and to my eyes, clearly not belonging to the same 'species.' I, therefore, cannot with any certainty identify the series collected in the Outer Hebrides, but so far as I can at present deal with them, they may be:—

561/5. THYMUS PYCNOTRICHUS Uechtr.
N.U.: Outer dunes near Newton.

561/9. THYMUS ZETLANDICUS Ronn. & Druce.
N.U.: Scolpaig. S.H.: Rodel: "variable, some specimens weak or a different form." A small white-flowered specimen from Rudha Romagi (coll. J.W.C.) may also belong here (or to *Drucei*).

561/10. THYMUS NEGLECTUS Ronn.
S.H.: Northton; Borosdale, near Rodel.

561/11. THYMUS BRITANNICUS Ronn.
N.U.: Alioter. N.H.: Husinish. L.: Carloway; Butt of Lewis." (W.)

572/2. SCUTELLARIA MINOR Huds.
N.U.: Loch na Morgha (coll. J.W.C.). L.: Loch Soval.

573/1. PRUNELLA VULGARIS L.
L.: Butt of Lewis.

577/5. STACHYS PALUSTRIS L.
N.H.: Near Carnach. (W.)

578/2. GALEOPSIS TETRAHIT L.
N.U.: Trumisgarry. L.: Carloway.

581/3. LAMIUM PURPUREUM L.
N.U.: By Newton Lodge.

581/4. LAMIUM HYBRIDUM Vill.
N.U.: By Newton Lodge. (W.)

581/5. LAMIUM MOLUCCELLIFOLIUM Fr.
N.H.: Near Carnach. (W.)

581/6. LAMIUM AMPLEXICAULE L.
N.U.: Drive, Newton Lodge.

586/1. TEUCRIUM SCORODONIA L.
S.H.: Borosdale, near Rodel.

588/3. PLANTAGO CORONOPUS L.
S.H.: Salting, Northton. L.: Butt of Lewis.

588/5. PLANTAGO MARITIMA L.
L.: Butt of Lewis.

588/8. PLANTAGO LANCEOLATA L.
N.U.: Semi-fixed dunes, near Newton.

588/10. PLANTAGO MAJOR L.
N.U.: By Newton Lodge.

589/1. LITTORELLA UNIFLORA (L.) Asch.
N.U.: Near Burrival.

600/8. CHENOPODIUM ALBUM L.
N.U.: By Newton Lodge. (W.)

606/7. ATRIPLEX GLABRIUSCULA Edmondst.
L.: Near Callanish.

611. SALICORNIA L.
L.: Salt marsh, near Callanish: too young to determine.

*611/7. SALICORNIA GRACILLIMA (Towns.) Moss.
N.U.: Ahmore Strand (coll. J.W.C., det. W. & M.S.C.)

615/2. POLYGONUM CONVOLVULUS L.
S.H.: Weed in the hotel garden, Rodel. (W.)

615/5. POLYGONUM AMPHIBIUM L.
N.U.: Loch a' Chaolais.

615/7. POLYGONUM PERSICARIA L.
L.: Carloway.

617/1. OXYRIA DIGYNA (L.) Hill.
N.H.: Below Tomnaval.

618/3. RUMEX CRISPUS L.
N.U.: Lingay Strand.

618/6. RUMEX OBTUSIFOLIUS L.
S.H.: Near Rodel. (W.)

618/14. RUMEX ACETOSA L.
N.U.: Wet rocks, Beinn Bhreac.

618/16. RUMEX ACETOSELLA L.
S.H.: Borosdale, near Rodel.

641/1. MYRICA GALE L.
L.: Loch Soval.

650/9. SALIX AURITA L.
S.H.: Borosdale, near Rodel. (W.)

650/11. SALIX "ARENARIA-REPENS" Floderus.
S.H.: Borosdale, near Rodel: on a maritime rock face, a most peculiar straggling bush. L.: Butt of Lewis. (W.)

*650/13. SALIX PHYLICIFOLIA L.
N.H.: Streamside by the bridge, Scaladale (coll. and det. W.)

651/2. POPULUS TREMULA L.
N.U.: Lower rocks, north side of Eaval.

652/1. EMPETRUM NIGRUM L.
N.U.: Alioter; west side of Burrival; rocks by shore, Loch Eport.

663/1. LISTERA OVATA (L.) R. Br.
N.U.: South-west of Clachan, near Reumisgarry. N.H.: Husinish.

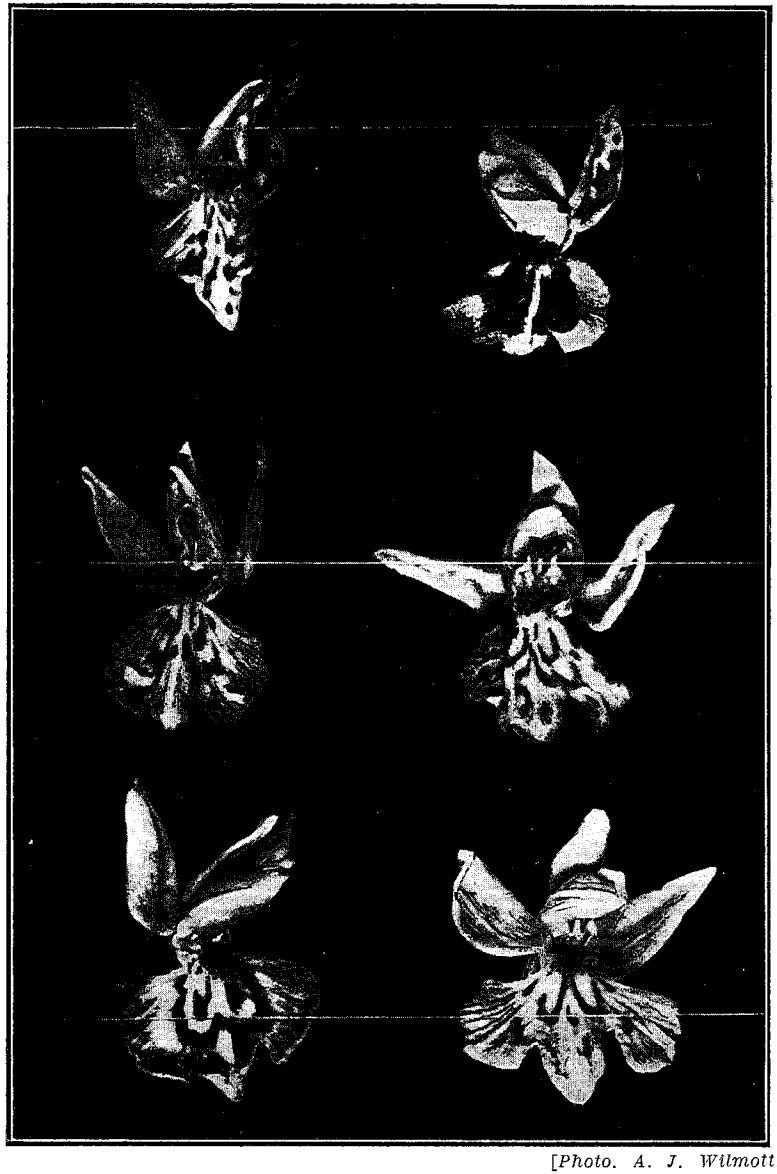
663/2. LISTERA CORDATA (L.) R. Br.
N.U.: At the foot and on slopes of Eaval. N.H.: Slopes below Tomnaval.

669. ORCHIS L.
"Marsh Orchids were again particularly studied (and photographed), and except for two peculiar series observed in N.U.: South of Clachan (Reumisgarry) and L.: near Lionel, they were straightforward.

669/7. ORCHIS LATIFOLIA L. (sec. Pugsl.), var. COCCINEA Pugsl.
This is the only form of the species observed, and it is possible that the paler-coloured plant seen last year at N.U.: Scolpaig, was merely a faded specimen of this same variety. It seems somewhat less abundant than *O. purpurella* in Harris and Lewis. N.U.: Clachan (Reumisgarry). S.H.: Borve (F.D., fine specimens, probably what Dr Druce recorded—*B.E.C. 1928 Rep.*, 760 (1929)—as *O. incarnata*, var. *pulchrior*). N.H.: Husinish (Dr Druce records vars. *pulchrior* and *dunensis*). L.: Lionel.

O. elodes × *latifolia*, var. *coccinea*, occurs with the parents at S.H.: Husinish.

669/9. ORCHIS PURPURELLA T. & T. A. Stephenson.
N.U.: Scattered throughout, often abundant. S.H.: Borosdale, near Rodel (W.); Leverburgh; seen at Borve (no doubt *O. praetermissa* Druce, *B.E.C. 1928 Rep.*, 760). N.H.: Near Tarbert (coll. J.W.C. and M.S.C.); Carnach; Husinish (i.e. *O. praeter-*



[*Photo. A. J. Wilmott.*

FLOWERS OF ORCHIDS FROM LIONEL, LEWIS.

Six flowers from different marsh orchids collected at Lionel, Lewis (× *c.* 3; the lines 2 cm. apart). The top right flower was at the time thought to be *O. latifolia*, var. *coccinea* × *O. purpurella*, the dark crimson blotch coming from the former and the rich purple ground colour from the latter but no *O. purpurella* was observed there. The remainder may be hybrid forms, *O. occidentalis* and *O. elodes* being other parents. The bottom right flower was at the time thought to be *O maculata* (*Fuchsii*), but there is no certain record of that plant for the Outer Isles and it is possibly *O. elodes* × *occidentalis*.

missa and var. *pulchella* Druce, *B.E.C. 1928 Rep.*, 760). L.: Balallan (coll. J.W.C. and M.S.C.); Carloway; Breasclete.

No attempt was made to separate the var. *pulchella* (Druce) Pugsley.

669/9(2). ORCHIS OCCIDENTALIS (Pugsley) Willmott, comb. nov.
N.U.: Clachan (Reumisgarry): larger and more typical than on the Newton sandhills, and nearly over when the other marsh orchids were in good condition. The range of leaf markings varied exactly as in the Irish plants.

669/10. ORCHIS ELODES Griseb.
Widespread and general. N.U.: A peculiar plant near Burrival had bright pink (lined) flowers and reddish leaf spots and dots. S.H.: Leverburgh. N.H.: Near Tarbert (coll. J.W.C. and M.S.C.); Meavaig (coll. J.W.C.). L.: Observed near Carloway, and noted as "not observed to-day on the moors" between there and Stornoway; and cf. hybrids with *O. purpurella.*

× O. FORMOSA T. & T. A. Stephenson (*O. elodes* × *purpurella*). This hybrid is frequent where the two parents grow together. N.U.: Near Newton Ferry; Clachan (Reumisgarry); Ahmore; Scolpaig. S.H.: Borosdale, near Rodel; Leverburgh (no doubt the *O. maculata* × *praetermissa*, Druce, 1928, from O.H.; Borve; Husinish, etc.). N.H.: Near Tarbert (coll. J.W.C. and M.S.C.); Carnach; above Loch Langavat and near Amhuinnsuidh (a tall form unlike any of the others). L.: Near Callanish; Carloway; also observed at Breasclete.

Two difficult series were observed. The first was sent me from L.: Lionel (coll. M.S.C.), which was at the time divided into four parts (A-D). (A) were *O. latifolia*, var. *coccinea*; (B) had leaf markings of *O.* "*Fuchsii*" and a fairly trifid labellum, but the labellum had broad lateral lobes with crenate margin, and since no definite record for *O.* "*Fuchsii*" appears to exist for the Islands, the identification is doubtful; (C) were taken to be (B) × *O. purpurella*; (D) was a singleton most remarkable form taken to be (A) × (C), the whole basal half of the labellum being a rich blackish magenta, as if the *coccinea* colour had been superposed on the purple basic colour over an area equal to its smaller size. Since no *O. purpurella* was noted, however, it now seems possible that (C) may have been *O. occidentalis*, while (B) was (A) × (C). Further field observation is needed to disentangle these.

The second difficult series is that spread over marshy fields in N.U.: Clachan (Reumisgarry). Here may be found *O. elodes*, *O. latifolia*, var. *coccinea*, *O. occidentalis*, and *O. purpurella*. Hybrids were clearly abundant, especially *elodes* × *purpurella*, but others which seemed recognisable were hybrids of *latifolia*, var. *coccinea* with *O. elodes*, *O. purpurella*, and *O. occidentalis*; and hybrids of *O. occidentalis* with *O. elodes* and *O. purpurella*. These also require study again in the field." (W.)

669/14. ORCHIS MASCULA L.

N.U.: On a dry bank above the Goulaby burn, near Newton (coll. J.W.C.).

674/4. COELOGLOSSUM VIRIDE (L.) Hartm.

N.U.: Dunes, near Newton; Suenish; south of Clachan, near Reumisgarry. S.H.: Church ridge, Rodel. N.H.: Husinish.

"'*Habenaria viridis*, var. *bracteata* A. Gray' was recorded by Bennett on Shoolbred specimens from N.U.: Newton, but the species is extremely variable there and near Clachan (Reumisgarry). The individuals with larger more conspicuous bracts are not the true *C. bracteatum* (Willd.) Parl., which is a plant of Eastern North America reaching Eastern Asia and Japan. Prof. Fernald (1926: *Rhodora, 28*, 172) distinguishes these large-bracted European forms as var. *Vaillantii* (Ten.) Fernald, '*Hab. bracteata* of European authors, not *Orchis bracteata* Muhl.),' and Dr Druce's record [*B.E.C. 1928 Rep.*, 761 (1929)] of 'var. *Vaillantii*' from N.H.: Husinish, is no doubt meant to refer to the same form, for on the sandhills and slacks there we found the same range of variation as at Newton, plants tiny to large, flowers greener or browner (or reddish), spikes large or small, dense to lax, bracts smaller to larger and conspicuous. The middle lobe of the labellum is always present, and the lateral lobes vary somewhat in length and breadth. But there is nothing to match Tenore's original description, the chief point of which is that the labellum is dilated and trifid, as figured by Vaillant, not linear and tridentate. Prof. Fernald adds that he had not seen the original description: that being so he should not have made a comb. nov., for his misuse of the epithet, which should apply to Tenore's plant, creates difficulty. Whether our extreme plants should be called var. *macrobracteata* (Schur), which Fernald cites as synonym, is also doubtful, for that is described (Schur, *Enum. Transs.*, 645) as 10 to 15 inches high . . . spike dense, 2-3 inches, flowers yellowish-green, bracts leafy, three times as long as the flowers: our plants do not agree with this." (W.)

674/7. PLATANTHERA BIFOLIA (L.) Rchb.

N.U.: Near Ahmore. S.H.: Near Borve. N.H.: Meavaig (coll. J.W.C.); above Loch Langavat, near Husinish.

702/6. ALLIUM URSINUM L.

N.U.: Beinn Bhreac; stream bed, north side of Eaval.

706/1. SCILLA VERNA Huds.

L.: West of the lighthouse, Butt of Lewis.

714/1. NARTHECIUM OSSIFRAGUM Huds.

L.: Kintaravay.

718/4. JUNCUS EFFUSUS L., em. Koch.

Only observed once. N.H.: near Bunaveneadar. (W.)

718/4b. JUNCUS EFFUSUS L., em. Koch, var. COMPACTUS Lej. & Court. The widespread form: N.U.: Newton; by Loch Eik. L.: Stornoway. (W.)

718/6. JUNCUS BALTICUS Willd.
N.U.: South-west of Clachan, near Reumisgarry. L.: Lionel.

718/10. JUNCUS LAMPOCARPUS Davies.
N.H.: Above Loch Langavat, near Husinish. (W.)

718/12. JUNCUS BULBOSUS L.
N.U.: Loch an Armuinn (coll. J.W.C.); near Grenetote, towards Geireann.

718/15. JUNCUS GERARDI Lois.
S.H.: Borosdale, near Rodel. This was noted last year when very young as ? *J. tenuis* Willd. More mature specimens collected in 1937 show it to be a peculiar form of *J. Gerardi* Lois. It has not yet been possible to obtain further specimens of the Benbecula plant. L.: Salt marsh, near Callanish; Butt of Lewis; Carloway.
"Var. SALSUGINOSUS Regel ex Lindeb." N.U.: South of Clachan, near Reumisgarry. S.H.: Bare wet sand, Northton. See Arthur Bennett in *A.S.N.H.*, 1910, p. 234.

718/17. JUNCUS BUFONIUS L.
L.: Balallan; edge of salt marsh, near Callanish.

719/1. LUZULA SYLVATICA (Huds.) Gaud.
N.U.: Slopes of Eaval.

719/4. LUZULA MULTIFLORA (Retz.) Lej.
N.U.: Suenish, near Newton. N.H.: Bunaveneadar. L.: Loch Soval. (W.)

719/6. LUZULA CAMPESTRIS (L.) DC., em. Lej.
N.U.: Clachan dunes, near Trumisgarry. S.H.: Borosdale, near Rodel. L.: Carloway; near Callanish. (W.)

722/3. SPARGANIUM SIMPLEX Huds.
L.: Loch by school, 2 miles south of Carloway. (W., H.W.P. agrees.)

735/1. TRIGLOCHIN MARITIMUM L.
N.U.: South-west of Clachan, near Reumisgarry. S.H.: Bare wet sand, Northton. (W.)

735/2. TRIGLOCHIN PALUSTRE L.
S.H.: Borosdale, near Rodel. N.H.: Husinish. L.: Salt marsh, near Callanish; Loch Soval. (W.)

737/1. POTAMOGETON NATANS L.
N.U.: Loch Veiragvat and Loch a' Chaolais (coll. J.W.C.); Scolpaig.

737/2. POTAMOGETON POLYGONIFOLIUS Pourr.
N.U.: Stream from north side of Eaval; by stream above Newton towards Beinn Bhreac. (Also a peculiar long and narrow leaved form in a deep shaded pool.) L.: Loch Soval. (W.)

737/9. POTAMOGETON GRAMINEUS L.
N.U.: Scolpaig. (W., J.E.D. agrees.)

737/23. POTAMOGETON BERCHTOLDII Fieb. (P. PUSILLUS auct. non L.).
L.: Loch by the school, 2 miles south of Carloway. (J.E.D. and G. Taylor.) *P. pusillus* L. is included for v.-c. 110 in "Comital Flora," "Glasgow Catalogue," 1899, and "Supplement to Topographical Botany," 1906, but the only records for this species that I have so far traced are those made by Ar. Bennett in *Scot. Nat.*, 1891, p. 189: "(records by Mr W. S. Duncan) . . . Potamogeton pusillus, Scarp. *sp.*" and in *A.S.N.H.*, 1892, p. 62: N.H.: Scarp, W. S. Duncan. But Bennett's note a year later (*A.S.N.H.*, 1893, p. 101) seems to have escaped notice:—"110. Outer Hebrides. 1891 *Report*. Delete the following as on record, viz.: . . . Potamogeton pusillus." Duncan's specimen from Scarp dated "Autumn, 1890," sent to Bennett as "*P. obtusifolius* ?," placed by Bennett with *P. pusillus* (Bennett's No. 1274) is, however, in Herb. Bennett and Messrs Dandy and Taylor determine it as *P. Berchtoldii* Fieb.—i.e. *P. pusillus* auct.

737/28. POTAMOGETON PECTINATUS L.
N.U.: Dead Man's Loch (coll. J.W.C.). (J.E.D.)

737/30. POTAMOGETON FILIFORMIS Pers.
N.U.: Shallow loch east of Loch Scarie. (W., J.E.D. agrees.)

738/1. RUPPIA SPIRALIS L., ex. Dum.
N.U.: Loch an Duin, in considerable quantity (coll. J.W.C.: flower, W.: fruit). (W., J.E.D. agrees.)

740/1. ZOSTERA MARINA L.
N.U.: Loch an Duin (coll. J.W.C.).

745/3. ELEOCHARIS MULTICAULIS Sm.
N.U.: Loch Eik. N.H.: Scaladale.

746/4. SCIRPUS TABERNAEMONTANI Gm.
N.U.: Loch Veiragvat (coll. J.W.C.).

746/7. SCIRPUS CAESPITOSUS L.
N.U.: Burrival (coll. J.W.C.); north of Eaval.

746/8. SCIRPUS PAUCIFLORUS Lightf.
N.U.: near Newton, towards Beinn Bhreac. L.: Loch Soval.

746/13. SCIRPUS FLUITANS L.
N.U.: Near Grenetote, towards Geireann. S.H.: Loch near Rodel. L.: Loch Soval.

746/15. BLYSMUS RUFUS (Huds.) Link.
S.H.: Borosdale, near Rodel. L.: Salt marsh, near Callanish.

*747/1. ERIOPHORUM LATIFOLIUM Hoppe.
N.H.: Above Loch Langavat (coll. and det. M.S.C., W. agrees.)

747/2. ERIOPHORUM ANGUSTIFOLIUM Roth.
N.U.: Above Newton, towards Beinn Bhreac. N.H.: Above Loch Langavat; Tarbert (coll. F.D.); Bunaveneadar. (W.)

747/4. ERIOPHORUM VAGINATUM L.
N.H.: Above Loch Langavat; Scaladale. L.: Loch Soval.

748/2. RHYNCHOSPORA ALBA Vahl.
N.U.: Bog, north foot of Eaval. N.H.: Scaladale; above Loch Langavat. L.: Aird an Troim.

749/1. SCHOENUS NIGRICANS L.
N.U.: Loch na Morgha and near Burrival (coll. J.W.C.); by stream north side of Eaval. L.: Kintaravay.

753/7. CAREX ROSTRATA Stokes in With. [wrong authority given in last year's list].
N.U.: Loch na Creige. L.: Loch Soval; Kintaravay.

*753/8. CAREX LASIOCARPA Ehrh.
N.U.: Loch na Creige (coll. and det. M.S.C.); Loch na Morgha (coll. J.W.C., det. W.).

753/15. CAREX BINERVIS Sm.
N.U.: Slopes of Burrival; by Loch Eik. N.H.: Below Tomnaval; above Loch Langavat; Tarbert (coll. F.D.). "*Carex Sadleri*, which has been recorded from various localities in N.U., seems to be identical with *C. binervis* except in the shape of its perigynia, and is presumably merely a form of that species. The shape of the perigynia seems to vary between that normal for *C. binervis* and the extreme narrowness and length of those of *C. Sadleri*. Some specimens from Scaladale are intermediate in character." (W.)

753/19. CAREX HOSTIANA DC.
N.U.: Near Clachan, by Reumisgarry; main lower rocks, north side of Eaval. S.H.: Borosdale, near Rodel. N.H.: Above Loch Langavat; slopes below Tomnaval. (W.)

753/20. CAREX FLAVA L.
N.U.: Ahmore Strand; near Grenetote, towards Geireann. S.H.: Near Rodel; Borosdale, near Rodel. N.H.: Scaladale; above Loch Langavat; Husinish.

753/20c. CAREX FLAVA L., var. MINOR Towns.
N.U.: Burrival. L.: Butt of Lewis. (W.)

753/33. CAREX FLACCA Schreb.
N.U.: Beinn Bhreac. S.H.: Borosdale and near Rodel. (W.)

753/36. CAREX PANICEA L.
N.U.: Scolpaig. S.H.: Borosdale. N.H.: Above Loch Langavat. (W.)

753/38. CAREX LIMOSA L.
N.H.: Scaladale. L.: Aird an Troim.

753/49. CAREX GOODENOWII Gay.
Specimens showing considerable variation were collected in a number of localities in N.U., S. and N.H., and L.

753/49m. [=753/44c.] CAREX GOODENOWII Gay, var. HEBRIDENSIS (Ar. Benn.) Wilmott, in *Journ. Bot.*, *76*, pp. 137-141, 1938.
"The original locality, in which Duncan found the plant named

C. spiculosa, f. *hebridense*, by Bennett, is fully described in one of Duncan's letters, and a small area of turf agreeing with Duncan's description was searched. It bore a narrow-glumed form of *C. Goodenowii* which matched Duncan's form except that most of the glumes were obtuse or obtusish, and only a few at the base of the spike were acute as in Duncan's plant. At the time I thought that it would prove identical with Duncan's specimens in Herb. Bennett, but since there is this slight difference the area needs yet another visit before it can be stated whether the var. *hebridensis* still exists or has died out. I am, however, quite satisfied that the suggestion of any influence of *C. salina* Wahl. is entirely unfounded." (W.)

753/53. CAREX LEPORINA L.
S.H.: Borosdale, near Rodel; Leverburgh. N.H.: Carnach. L.: Roadside near Carloway, east of Loch an Duin; by the Standing Stones, Callanish; Loch Soval.

753/56. CAREX STELLULATA Good.
S.H.: Near Rodel. N.H.: Above Loch Langavat. L.: Loch Soval; by loch opposite school, 2 miles south of Carloway.

753/67. CAREX ARENARIA L.
N.U.: Outer dunes, near Newton. S.H.: Near Seilebost.

753/74. CAREX PULICARIS L.
N.U.: Suenish, near Newton; rocks, north side of Eaval. S.H.: Borosdale, near Rodel. N.H.: Above Loch Langavat. L.: Loch Soval.

753/74b. CAREX PULICARIS L., f. MONTANA Pugsl.
S.H.: Borosdale, near Rodel (coll. F.D.). (W., Mr Pugsley agrees.)

753/75. CAREX DIOICA L.
N.U.: Slopes of Burrival; stream bed, north side of Eaval; above Newton, towards Beinn Bhreac. N.H.: Above Loch Langavat.

766/1. ANTHOXANTHUM ODORATUM L.
N.H.: Bunaveneadar.

770/5. ALOPECURUS GENICULATUS L.
N.U.: Near Newton. L.: Lionel.

780/2f. AGROSTIS STOLONIFERA L., var. STOLONIFERA (L.) Koch.
S.H.: Bare wet sand, Northton. N.H.: Husinish. (W.R.P.)

780/3. AGROSTIS TENUIS Sibth.
N.H.: Carnach. The following were infected with *Tilletia decipiens* (*A. pumila* L.): N.U.: Near Grenetote, towards Geireann; near Lochmaddy. L.: Roadside near Carloway, opposite Loch an Duin. (W.R.P.)

780/6. AGROSTIS CANINA L.
N.U.: By Newton Lodge (coll. F.D.); in several localities near Eaval. S.H.: Borosdale, near Rodel. L.: near Carloway. (W.R.P.)

Var. ARIDA Schlecht.
N.U.: Roadside bank by Loch Eik. N.H.: Bunaveneadar. (W.R.P.)

787/1. AMMOPHILA ARENARIA (L.) Link.
N.H.: Husinish.

789/1. AIRA CARYOPHYLLEA L.
N.U.: Near Lochmaddy; sandy slope, Lingay Strand.

789/2. AIRA PRAECOX L.
N.U.: By Newton Lodge (coll. F.D.). S.H.: Rodel. L.: Carloway.

791/4. DESCHAMPSIA FLEXUOSA (L.) Trin.
N.U.: Alioter. S.H.: Borosdale, near Rodel. N.H.: Scaladale.

792/2. HOLCUS LANATUS L.
N.U.: Slopes of Eaval; roadside by Loch Eik; near Newton. N.H.: Husinish.
The two following are an albino form: N.U.: Trumisgarry; near Burrival (coll. J.W.C.).

794/2. AVENA PUBESCENS Huds.
N.U.: Suenish, near Newton. (W.)

795/1. ARRHENATHERUM ELATIUS (L.) M. & K.
N.U.: By Newton Lodge.

800/1. SIEGLINGIA DECUMBENS Bernh.
N.U.: Fixed dune, near Newton; sandy slope by Lingay Strand. L.: Near Callanish.

802/1. PHRAGMITES COMMUNIS Trin.
N.U.: Lochs Hungavat and Veiragvat (J.W.C.); Lochs Eik and Fada. (W.)

809/3. KOELERIA GRACILIS Pers., ssp. BRITANNICA Domin.
N.U.: Fixed dune, near Newton; dry bank, Scolpaig; Trumisgarry. S.H.: Borosdale, near Rodel. N.H.: Husinish; Carnach. L.: Lionel. "The upper part of the stem is pubescent in all, but in a few the stem is glabrous or glabrescent towards or near the base. The pubescence on the pale varies in length, mostly it is short and close (puberulous) but in others longer and spreading in the upper half or only nearer the apex. Yet all appear to belong under subsp. *britannica* rather than subsp. *typica* or *K. albescens* DC." (W.)

813/1. MOLINIA CAERULEA (L.) Moench.
N.U.: Scolpaig. L.: Lionel.

814/1. CATABROSA AQUATICA (L.) Beauv.
N.U.: Near Newton. (W.)

820/1. CATAPODIUM LOLIACEUM (Huds.) Link.
N.U.: Clachan dunes, near Newton.

824/2. POA PRATENSIS L.
N.U.: Near Newton Ferry. S.H.: Borosdale, near Rodel. (W.)

824/3. POA PRATENSIS L., var. SUBCAERULEA (Sm.).
N.U.: Clachan dunes and fixed dune near Newton. N.H.: Husinish. (W.)

824/6. POA TRIVIALIS L.
S.H.: Borosdale, near Rodel. N.H.: Carnach. (W.)

824/14. POA ANNUA L.
N.U.: Col between Beinn Bhreac and Beinn Mhor. "Light yellow green: making conspicuous flat circles on bare peat." (W.)

825/2. GLYCERIA FLUITANS (L.) R. Br.
N.U.: By Newton Lodge. S.H.: Nisabost. N.H.: Near Carnach. L.: Carloway; Balallan. (W.)

825/5. PUCCINELLIA MARITIMA (Huds.) Parl.
S.H.: Borosdale, near Rodel. L.: Salt marsh, near Callanish (det. J. E. Lousley).

826/7. FESTUCA RUBRA L., subsp. GENUINA, var. VULGARIS (Hack.) How.
N.U.: Beinn Bhreac (det. W. O. Howarth).

826/7e. FESTUCA RUBRA L., var. GLAUCESCENS (Heg. & Heer) How.
N.U.: Beinn Bhreac; outer dunes, near Newton. N.H.: Scaladale; Husinish (det. W. O. Howarth).

The specimens listed last year from N.U.: Newton; Crogary More have been similarily determined by Dr Howarth.

826/9. FESTUCA OVINA L.
N.H.: Carnach. (W.)

826/10b. FESTUCA VIVIPARA (L.) Sm.
N.U.: Rocks, north side of Eaval; edge of Ahmore Strand (coll. J.W.C.). S.H.: Borosdale, near Rodel. N.H.: Scaladale; above Loch Langavat; Carnach. (W.)

827/19. BROMUS MOLLIS L.
N.U.: Newton. N.H.: Near Carnach. (W.)

830/1. AGROPYRON JUNCEUM (L.) Beauv.
N.U.: Lingay Strand. N.H.: Husinish. (W.)

839. JUNIPERUS L.
"It is clear from the few specimens collected in N.U. and S.H. that the forms in the Islands need serious collection and study." (W.)

844/2. EQUISETUM ARVENSE L.
N.U.: Newton (coll. J.W.C.). (A.H.G.A.)

844/3. EQUISETUM SYLVATICUM L.
N.H.: Scaladale; near Ardvourlie. (A.H.G.A.)

844/5. EQUISETUM FLUVIATILE L.
N.U.: Scolpaig; south-west of Clachan, near Reumisgarry. S.H.: Nisibost. (A.H.G.A.)

844/6. EQUISETUM PALUSTRE L.
N.U.: South-west of Clachan, near Reumisgarry. L.: Salt marsh, near Callanish. (A.H.G.A.)

851/1. ASPLENIUM MARINUM L.
N.U.: West side of Burrival.

851/2. ASPLENIUM TRICHOMANES L.
S.H.: Borosdale, near Rodel (coll. F.D.). N.H.: Rocks below Tomnaval (coll. F.D.).

*851/3. ASPLENIUM VIRIDE Huds.
N.H.: Lower rocks, Tomnaval (coll. and det. F.D.).

851/5. ASPLENIUM ADIANTUM-NIGRUM L.
N.U.: West side of Burrival; slopes of Eaval. S.H.: Borosdale, near Rodel (coll. F.D.). L.: Carloway; near Breasclete.

853/1. ATHYRIUM FILIX-FOEMINA (L.) Roth.
N.U.: Slopes of Burrival; Beinn Bhreac. S.H.: Near Rodel. L.: By the river, Carloway. (A.H.G.A.)

856/4. DRYOPTERIS DILATATA (Hoffm.) A. Gray.
N.U.: West side of Burrival; lower main rocks, north side of Eaval; Beinn Bhreac. N.H.: Carnach. (A.H.G.A.)

856/5. DRYOPTERIS AEMULA (Ait.) O. Ktze.
N.U.: North foot, Eaval. (W.)

856/7. DRYOPTERIS OREOPTERIS (Ehrh.) Maxon.
N.U.: Beinn Bhreac (A.H.G.A.); north foot, Eaval. N.H.: Scree slope below Tomnaval.

856/9. DRYOPTERIS PHEGOPTERIS (L.) C. Chr.
N.U.: Lower main rocks, north side of Eaval. N.H.: Lower rocks, Tomnaval.

857/4. CYSTOPTERIS FRAGILIS (L.) Bernh.
N.H.: Lower rocks, Tomnaval. (A.H.G.A.)

858/1. POLYPODIUM VULGARE L.
N.U.: Beinn Bhreac; Alioter. S.H.: Borosdale, near Rodel.

863/2. HYMENOPHYLLUM PELTATUM Desv.
N.U.: Lower main rocks, north side of Eaval. N.H.: Tomnaval. (A.H.G.A.)

864/1. OSMUNDA REGALIS L.
N.U.: Hungavat; roadside between Clachan Burrival and Drimseidinish (both coll. J.W.C., who also saw plants at Loch an Tomain). L.: By the river, Carloway.

865/1. BOTRYCHIUM LUNARIA (L.) Sm.
N.U.: Suenish, and sandy slope Lingay Strand, near Newton; Clachan, near Reumisgarry; Scolpaig.

866/1. OPHIOGLOSSUM VULGATUM L.
N.U.: Sandy slope, Lingay Strand; Clachan dunes, near Reumisgarry.

870/7. LYCOPODIUM SELAGO L.
N.H.: Rocks below Tomnaval; Tarbert.

871/1. SELAGINELLA SELAGINOIDES (L.) Link.
S.H.: Rodel. N.H.: Slope below Tomnaval. L.: Butt of Lewis.

872/5. NITELLA TRANSLUCENS Ag.
L.: Loch by the school, 2 miles south of Carloway. (G. O. Allen.)

876/5. CHARA HISPIDA L.
N.U.: Loch a' Chaolais (coll. J.W.C.). (G. O. Allen.)

Records, previous to 1932, unconfirmed or not included in G. C. Druce's *Comital Flora*. (Only the earliest records so far traced are given.)

104/1. SPERGULA ARVENSIS L. em. Rchb.
Outer Hebrides, W. Macgillivray, 1830, ii, 94.

368/4. ANTHEMIS COTULA L.
N.U.: "Sandy meadows west side," Shoolbred, 1895, 242.

722/3. SPARGANIUM SIMPLEX Huds.
Outer Hebrides, Macgillivray, 1830, ii, 92.

738/1. RUPPIA SPIRALIS L., ex. Dum.
"*Ruppia maritima*" was recorded—as collected in 1841—by Balfour and Babington, 1842, *Ann. and Mag. Nat. Hist.*, viii, 541. The name may have been used only in a general sense as was done by Shoolbred (1895, 247). Since, however, the plant should have been in fruit when they were there (August) and Babington in 1843 (*Manual*, p. 326) separates *R. maritima* from *R. rostellata*, it is probable that any specimens which they collected will be found to be *R. spiralis* L., ex. Dum.

856/9. DRYOPTERIS PHEGOPTERIS (L.) C. Chr.
Harris and Scarp, Bennett (coll. W. S. Duncan), 1892, p. 63, as *Phegopteris polypodioides* Fée.

NOTES ON SOME ALDERNEY PLANTS.

J. D. Grose.

The chief work on the Botany of Alderney is E. D. Marquand's *Flora of Guernsey and the Lesser Channel Islands*, published in 1901. Marquand spent two summers on the island, and his list is remarkably complete and accurate. A *Supplement to the Flora* was edited by Mrs McCrae and published in the *Transactions of the Guernsey Society* in 1923. The *Supplement* is largely a collection of scattered records from various sources, and (as far as Alderney is concerned) localities are not given. From 1923 to 1936 I have been able to trace only five isolated records in the B.E.C. Reports, but there have been two valuable articles in the *Journal of Botany* (*71*, 106 (1933) and *75*, 299 (1937)) by Messrs A. B. and A. K. Jackson and H. K. Airy-Shaw. Several very interesting species were here recorded for the first time.

In June 1937 a week was spent at Alderney, and many of the rarer plants were seen in the localities given by Marquand. A few new records were made, but chiefly of plants which are common elsewhere, and, as such, may have been passed by visiting botanists without comment.

In the list below, all localities given, unless qualified, are new. A species has been deemed worthy of detailed stations only when so treated by Marquand. New records for the island are marked with an asterisk.

I am greatly indebted to Messrs P. M. Hall, C. E. Hubbard, and J. E. Lousley, who have examined and named a number of critical plants.

Ranunculus parviflorus L. Near Fort Tourgis.

R. hederaceus L. Trois Vaux Valley.

Matthiola incana (L.) R. Br. Platte Saline. Crabby Bay. Recorded by Miss Vachell (*B.E.C. 1929 Rep.*, 102 (1930)) without locality.

Alyssum maritimum Lam. Longy Road.

Erophila verna (L.) E. Meyer. Val du Sud.

Brassica incana (L.) F. Schultz and var. hirta (Bab.) Druce. Still at Braye Bay, but not common.

Coronopus didymus (L.) Sm. Butes Hill. Cats Bay. Essex Castle Hill. Newtown. Clonque Valley. Crabby Bay. Apparently it is an increasing species, as it is given by Marquand as rather rare.

Crambe maritima L. Several plants at Platte Saline; Marquand saw only one. Longy Bay.

Raphanus Raphanistrum L. Fort Houmet. Braye Bay.

Reseda lutea L. Hill near Terrace. Thought by Marquand to be extinct.

Helianthemum guttatum (L.) Mill. Still plentiful near Val du Sud, although it does not now extend for a quarter of a mile as given by Marquand.

SILENE CONICA L. Longy Bay. Near Fort Raz.

S. ANGLICA L. The pale rosy-pink form mentioned by Marquand occurs sparingly on the cliff at Les Becquets.

*S. GALLICA L., var. SYLVESTRIS (Schott.) Aschers. & Graebn. Near Fort Houmet. Les Becquets.

*LYCHNIS ALBA L. × DIOICA Mill. Near Hanging Rock.

POLYCARPON TETRAPHYLLUM L., var. *DIPHYLLUM DC. Near Hanging Rock. Corblets Bay. Corblets Point. Braye Bay. This is probably the common form in Alderney.

MALVA NEGLECTA Wallr. Essex Castle Hill. Hanging Rock Cliff. Thought by Marquand to be extinct.

HYPERICUM HUMIFUSUM L., var. *DECUMBENS Reichb. Near Fourquie. Corblets.

RADIOLA LINOIDES Roth. Near Fort Houmet. Near Hanging Rock. Fort Quenard. Apparently an increasing species, as there have been only two stations previously recorded. Plants from each locality were uniformly small.

GERANIUM ROTUNDIFOLIUM L. Quarry near La Tchue.

*G. PUSILLUM L. Braye Bay. Previously known only for Jersey of the Channel Islands.

ERODIUM MARITIMUM L'Hérit. Trois Vaux Bay. Telegraph Bay. Val du Sud. Cats Bay.

ONONIS RECLINATA L. Seen in several parts of the coast, but it is not nearly as plentiful as would be expected from the Flora.

*MELILOTUS ALTISSIMA Thuill. Butes Hill.

TRIFOLIUM INCARNATUM L. Above Hanging Rock.

T. STRIATUM L., var. ERECTUM Gaspar. Cats Bay.

T. GLOMERATUM L. Near Val du Sud. Cats Bay. Corblets.

T. SUFFOCATUM L. Cats Bay.

LOTUS CORNICULATUS L. A pale-coloured form grows at Corblets in which the standard margins are folded forwards and meet in a point at the top. The keel, also, protrudes beyond the wings, thus giving a " double-pointed " appearance which is most striking.

ORNITHOPUS PINNATUS (Mill.) Druce. Meadow above Hanging Rock. Near Fort Quenard. Present existence confirmed also at Mannez Quarry and at two localities near Val du Sud. A very hairy form occurred on the cliff at Val du Sud.

LATHYRUS PRATENSIS L. Still persists in its only known locality at Longy Bay.

BUPLEURUM OPACUM Lange. Near Fort Raz. Several other stations were confirmed.

CHAEREFOLIUM ANTHRISCUS (L.) Schinz & Thell. Near Val du Sud. Braye Bay.

*TUSSILAGO FARFARA L. Cachliere Pier.

PETASITES FRAGRANS Presl. Near Terrace. Mourias, St Annes.

PICRIS ECHIOIDES L. Butes Hill.

CREPIS CAPILLARIS (L.) Wallr., var. *GRISEOLA Thell. Val du Sud.

TRAGOPOGON MINOR Mill. White Gates.

LIMONIUM LYCHNIDIFOLIUM O. Kuntze, var. CORYMBOSUM C. E. Salmon. Marquand noted about a dozen plants at Fort Houmet, but in 1932 Messrs A. B. and A. K. Jackson counted about sixty. In 1937 only about twenty-five could be found.

*SYMPHYTUM PEREGRINUM Ledeb. Near La Tchue.

*VERBASCUM THAPSUS L. Essex Castle Hill.

LINARIA CYMBALARIA (L.) Mill. Now abundant all over the town of St Annes.

OROBANCHE AMETHYSTEA Thuill. Longy Bay. Platte Saline. In one case parasitic on *Glaucium*.

Marquand recorded "*Orobanche amethystea* Thuill." from two localities, and what is probably the same form was noticed at Longy Bay and Platte Saline. There is some doubt that *O. amethystea* is the correct name, but the plants agree well with Butcher and Strudwick's description and figure, and are distinct from normal *O. minor* in the following particulars:—Bracts more gradually tapering; corolla shorter and broader, less curved above, and with a larger lower lip; ovary broader, more abruptly narrowed below the style and slightly glandular; style shorter and stigmatic lobes more confluent; the whole plant is much more richly coloured with a reddish-purple shade, quite distinct from the bluish purple of *O. purpurea*.

O. PURPUREA Jacq. Very abundant in many places. It flowers almost before the leaves of the host, *Achillea Millefolium*, have appeared.

HERNIARIA GLABRA L. Still at Bibette Point, in very small quantity.

POLYGONUM AMPHIBIUM L. Platte Saline.

THESIUM HUMIFUSUM DC. Braye Bay.

ANACAMPTIS PYRAMIDALIS (L.) Rich. Platte Saline.

ALLIUM TRIQUETRUM L. In many new localities; apparently increasing rapidly.

CAREX PANICULATA L., var. *SIMPLEX Peterm. Clonque Valley.

*KOELERIA BRITANNICA (Domin). Braye Bay.

BROMUS RIGENS L. Still at Braye Bay, but not common.

B. HORDEACEUS L., var. THOMINEI Rouy. Cachaliere Pier. Fort Albert.

ASPLENIUM TRICHOMANES L. Near Rose Farm.

A. RUTA-MURARIA L. Longy Road. Wall near Terrace, one plant.

DRYOPTERIS FILIX-MAS (L.) Schott. Butes Hill.

CETERACH OFFICINARUM Lam. & DC. Wall near Terrace. This may be Marquand's single locality where he saw only three plants. There are several hundreds there now. Sparingly on wall near Rose Farm.

ISOETES HYSTRIX Durieu. This rare terrestrial Quillwort was found by Marquand in the year following the publication of his *Flora*. The station is given as "Cliffs immediately opposite the coast of France." That part of the island, however, which is nearest

the mainland is low-lying, and a prolonged search failed to locate the plant. The search was extended southwards, and eventually a few specimens were found on the cliff between Hanging Rock and La Tchue at nearly 200 feet altitude. The short turf very effectually hides the thread-like leaves which are the only indication of the presence of the plant. Unlike the Guernsey localities, the soil here is neither sandy nor damp.

CHARA VULGARIS L. Longy Pond. Given in the *Supplement* but without locality.

THE GENUS TILIA IN BRITAIN.

H. A. Hyde, M.A., F.L.S.

Preliminary study of this (in Britain) small genus has shown that a number of points connected with it require elucidation. These are referred to briefly below: any relevant information (whether accompanied by specimens, which should be very fully labelled, or not) will be very gratefully received by the writer.

1. Large-leaved Lime (*T. platyphyllos* Scopoli) is believed to occur as a native in rocky mountain woods in the following vice-counties:—W. Gloster (34), Monmouth (35), Hereford (36), Salop (40), Brecon (42), Radnor (43), Derby (57), N.W. Yorks (65). Confirmatory specimens from v.-cc. 35, 43 and 57 would be welcome, as also would evidence of the occurrence of this species as a native tree in any vice-county not mentioned.

2. Small-leaved Lime (*T. cordata* Miller) is believed to occur as a native tree in semi-natural woodland from Devon to Durham; it is commoner in the west than in the east. Confirmatory specimens from the eastern and southern counties and from any of the following are desired:—E. Gloster (33), Warwick (38), N.E. Yorks (62).

Occasional specimens of *T. cordata* bear leaves which are more or less three-lobed, and appear therefore to approach the var. *vitifolia* Schneider. It is not known to what extent the peculiarity is shared by all leaves on a given tree. Information relating to this point, together with specimens, is desired.

3. Common Lime (×*T. vulgaris* Hayne) has not yet been recorded with certainty as a native tree in Britain. The putative parents grow together at various stations (Gt. Doward, Symonds Yat, Lancaut, Craig Cilau). Specimens of ×*T. vulgaris* from any such situations would be welcome.

A second hybrid between the two native Limes, viz., *T. pallida* Wierzbicki, is in cultivation in Britain. It is distinguished from ×*T. vulgaris* " by the smaller leaves often not much larger than those of *T. cordata*, as broad as or broader than long, yellowish or bluish-green beneath; it is readily distinguishable from *T. cordata* by its prominent tertiary venation and has flowers and fruits like those of typical *T. vulgaris* " (Henry). Specimens of this form and information bearing on the question of its frequency relative to that of the " type " are desired.

RUBUS ECHINATUS LINDLEY.

WILLIAM WATSON.

The publication of Weihe and Nees' *Rubi Germanici* was completed in 1827. In 1829 Lindley attempted in his *Synopsis of the British Flora* to identify with Weihe and Nees' species some British fruticose brambles which he had been studying for several years.

In every case where Lindley identifies a British bramble with one of Weihe and Nees' species he gives Weihe and Nees' description, but rarely any other particulars. A specimen of the British bramble he had in view is in a few instances preserved in Lindley's herbarium, and Borrer's herbarium contains certain specimens which came from the garden of the Horticultural Society, from bushes which Lindley said represented the species of his *Synopsis*, ed. 1. From these specimens it is possible to judge the success of Lindley's identifications with the German brambles. It does not amount to much. Only once—in the case of *Rubus fusco-ater*—does the specimen of Hb. Lindley agree with the bramble of Weihe and Nees; and not once does the specimen from the garden agree with the bramble intended by those authors.

It must be kept in mind, therefore, that very little dependence can be placed on any *unsupported* statement of Lindley that one given bramble or specimen is identical with some other named bramble.

One new species appears in the *Synopsis*, ed. 1, namely *Rubus echinatus*. For this we have the description which—the species being new—Lindley had to write himself, and it is no doubt authentic. There is not a specimen of *R. echinatus* in Hb. Lindley; but in Hb. Babington there is one that once belonged to Leighton and was identified by Lindley in 1836 as *R. echinatus* Lindl. *Syn.*, ed. 1. There is also a specimen in Hb. Borrer which was sent by Leighton and is marked "*R. rudis* (*R. ech.*, ed. 1)—Prof. Lindley." These specimens agree with each other and with Lindley's description of *R. echinatus* in ed. 1. Specimens and description are *R. hystrix* Weihe & Nees. I know of no other specimen determined by Lindley as *R. echinatus*.

There is in Hb. Borrer a specimen from the Horticultural Society's garden, labelled by Borrer as *R. echinatus*, but it is a different species. Borrer has written a note that it is the bramble that Lindley called *R. rudis* Weihe & Nees; and it is a fact that it is identical with a specimen in Hb. Lindley that Lindley has determined as *R. rudis*. This specimen of Borrer's labelled "*R. echinatus*" has sent all modern British authors astray: they have regarded the specimen as authentic and ignored Lindley's description and the specimens determined by him for Leighton.

Lindley's description of *R. echinatus* ed. 1 is ". . . Leaflets . . . roundish cordate . . . green . . . beneath. Panicle spreading . . . leafy at the base . . ." This is right for *R. hystrix*, wrong for Lindley's "*R. rudis*," as that has leaves white beneath, obovate leaflets with an en-

tire base, and a long, narrow panicle, which is leafy throughout. The specimen from the garden is the latter bramble, and is therefore not authentic *R. echinatus*.

Babington, it is true, speaks of the bush in the garden of the Horticultural Society as authentic (*British Rubi*, 209), but his only warrant for doing so appears to be that Lindley referred Borrer to the living bushes in the garden, in 1829, as representing the species in Lindley's *Synopsis*, and that in the preface to the *Synopsis* Lindley says the new species he had added were all growing in the garden of the Horticultural Society, where, he says, he had studied them for several years. This is not quite conclusive, as Lindley does not say that he had *described* his species from the bushes in the garden—in the case of *R. echinatus* he cannot have done so, as plant and description are not reconcilable—and according to Babington (*British Rubi*, 4, footnote) he actually denied that the bush of *R. diversifolius* in the garden was authentic. This is hard to understand, as the bush in the garden was *R. vestitus*. *R. diversifolius* in Hb. Lindley is *R. vestitus*, and the description of *R. diversifolius* in *Syn.*, ed. 1, is *R. vestitus* too. None of these would be authentic, however, for *R. diversifolius* of *Syn.*, ed. 2, which is *R. myriacanthus* Focke, and this may have been what Lindley meant by his denial.

Clearer instances where the bush in the garden cannot have been authentic are to be found where the species of the *Synopsis* is represented both by a specimen from the bush in the garden, and by a specimen in Lindley's herbarium. *R. leucostachys* from the garden was *R. vestitus*, *R. leucostachys* in Hb. Lindley is *R. leucostachys* Smith, the description in the *Synopsis* is *R. leucostachys* Smith. The bush in the garden was therefore not authentic. (Incidentally the *R. leucostachys* of Lindley's ed. 2 is *R. Lindleyanus* Ed. Lees, so in this case also Lindley changed the application of a name in ed. 1 to a fresh plant in ed. 2). Take another example: *R. fusco-ater* in Hb. Lindley is true *R. fusco-ater* Weihe & Nees, but the *R. fusco-ater* from the garden is *R. dasyphyllus* Rogers. That is to say, the bush in the garden again was not authentic. It is evident, therefore, that it would not be safe to assume, where corroboration is lacking, that any specimen from the garden was authentic.

Now it happens that there is an indication from a fresh quarter that the garden plant was not the true *R. echinatus* Lindl. By mistake Babington published a description of a specimen of Lindley's "*R. rudis*" in *Man.*, ed. 1 (1843) as *R. echinatus* Lindl. Babington's specimen is in Hb. Brit. Linn. It came from Leighton, who gathered it in 1837 at Haughmond Abbey, Salop. In *Syn. Br. Rubi*, 23 (1846), Babington himself acknowledges the error, "An incorrectly named and supposed authentic specimen caused me formerly to consider this as *R. echinatus* (Lindl.), which I have now ascertained to belong to *R. fusco-ater* of Weihe." At page 26, *l.c.*, the true *R. echinatus* Lindl. is described under the name of *R. fusco-ater*, g. *echinatus*. A specimen from Haugh-

mond Abbey is quoted: I have seen this and it is *R. hystrix* Weihe & Nees.

Lindley's subsequent treatment of "*R. rudis*" and *R. echinatus* in the second edition of his *Synopsis* (1835), combining them as one species, "*R. rudis*," seems to have been due to his declared determination, on general grounds, to reduce the number of his species. He has brought the 21 fruticose species of ed. 1 down to 12, but has included two new ones from Weihe and Nees' monograph. There can be no doubt that *R. echinatus* is distinct from his "*R. rudis*." He correctly distinguished them for Leighton, and they are distinguished still by modern authors, as *R. hystrix* Weihe & Nees (Hystrices) and *R. discerptus* P. J. Muell. (Radulae) respectively.

Boulay and Sudre have noticed that *R. echinatus* Lindl. is not the same as Lindley's "*R. rudis*." When Focke in *Syn. Rub. Germ.* (1877) brought it to notice that the English "*R. rudis*" was not the *R. rudis* of Weihe & Nees, and that a different name was therefore required for Lindley's bramble, he does not seem to have referred to Lindley's description of *R. echinatus* (1829) although he cites it. He seems merely to have taken Babington's statement (*Br. Rubi*, 189) that his "*R. rudis*" was *R. echinatus* of his ed. 1. He also cannot have observed the contradictory statement on page 201, *l.c.*, that *R. echinatus* Lindl., ed. 1, was *R. Koehleri*, a *verus* Bab. The contradiction is explained on page 209, *l.c.*, where Babington states that if *R. echinatus* Lindl. is determined by the specimens named by Lindley it is a form of *R. Koehleri*, a *verus*, but if by the authentic plant in the Horticultural Society's garden it is the *R. rudis* of Weihe and of Lindley. (Babington gives *R. fusco-ater*, g *echinatus* Bab. as a synonym of *R. Koehleri*, a *verus*). As has been shown, it is quite impossible that the bush in the garden can have been authentic.

It is extraordinary that Linton and Rogers in *Journ. Bot.*, 1905, 203, should have claimed Babington's description of *R. echinatus* in *Man.*, ed. 1 (1843), as a full and unmistakable description of Lindley's *echinatus*. That description on examination will be found to be mainly copied from Lindley, but with additions clearly supplied from "*R. rudis*," with the result that it describes neither "*R. rudis*" nor *R. echinatus*. Also, as has been seen, Babington afterwards found that the specimen from which he wrote the description was not the true *R. echinatus*. Rogers and Linton acknowledge that Lindley's description seems to them "not a good description." The explanation, of course, was that the bramble which they and Focke and others knew as *R. echinatus* was different from Lindley's bramble.

To summarise briefly: *Rubus echinatus* Lindley *Syn.*, ed. 1 (1829), is the same as *Rubus hystrix* Weihe & Nees (1825), and as the latter name has the priority *Rubus echinatus* cannot be used. The correct name for the plant to which botanists have transferred the name *R. echinatus* is *Rubus discerptus* P. J. Muell. (1859).

RUBUS ROTUNDIFOLIUS (BAB.) BLOX. APUD KIRBY.

WILLIAM WATSON.

In *Ann. Nat. Hist.*, *2*, 40 (1848), under the name *Rubus glandulosus*, e. *rotundifolius*, Babington described specimens of a bramble sent to him by Bloxam, who had obtained them from a small plantation of firs on the Appleby road near Twycross, Leicestershire. Bloxam raised the bramble to specific rank in an account of the brambles of Leicestershire which he contributed to Kirby's *Fl. Leic.*, ed. 2, 39 (1850).

The original specimens are in Herb. Babington at the British Museum of Natural History, South Kensington, and from them a lectotype has been chosen by Messrs Barton & Wilmott. I have seen these specimens, and I think there can be no doubt that they are the same as *R. Drejeri* G. Jensen in *Fl. Dan.*, t. 3023 (1883).

All English authors after Babington, and all Continental authors, have used the name *R. Drejeri*, but this must now give place to the earlier name *R. rotundifolius*.

The *Rubus hirtus*, var. *rotundifolius*, of Rogers's *Handbook*, 88 (1900) is different from Bloxam's bramble.

Rogers suggests in the *Handbook*, 66, that the type specimens of *R. Newbouldii* Bab., collected at Loxley by Newbould, are *R. Drejeri*, and later he confirmed that determination.

If this opinion were correct *R. Newbouldii* would have to be regarded as a synonym of *R. rotundifolius*. I have examined the Babington type specimens and I find that whilst the stem-piece is *R. rotundifolius*, the panicle belongs to *R. radula*, subsp. *echinatoides* Rog. That the specimens were mixed from the outset is proved by Babington's observation in describing them originally in *Ann. Nat. Hist.*, *19*, 87 (1847) that the panicle was "exactly like that of typical *R. rudis*." By "*R. rudis*" at that time Babington meant the bramble which Focke later called "*R. echinatus*," and from resemblances to that bramble *echinatoides* took its name. The panicle of *R. rotundifolius* bears no resemblance to *R. radula*, sub-sp. *echinatoides*. As *R. Newbouldii* Bab. in *Journ. Bot.*, 1887, 20, is equally founded on these mixed type specimens, it cannot stand and cannot be quoted as a synonym of *R. rotundifolius*.

MATERIAL FOR A STUDY OF TAXONOMIC PROBLEMS IN TARAXACUM.

W. B. Turrill.

The dandelions are an important element in the existing flora of the British Isles as its constitution has been modified, qualitatively and quantitatively, by man. That they owe their great abundance in individuals to man is obvious from their common occurrence as weeds and ruderals or in habitats much changed by man. Needless to say, the dandelion figures prominently in folklore and in herbalist medicine and all parts of the plant have been or are put to human use. Relative to the size of the plant as a whole the flower-heads at full anthesis are large and conspicuous. As has been said: " were it not so familiar, [it] would probably be thought attractive " (1).

As is well known, and more fully discussed below, many, and probably most, of the dandelions of northern and western Europe are apomictic, i.e., they set viable seed without fertilisation. From the taxonomic standpoint the known or supposed apomicts in *Taraxacum* have not been so intensively studied, in the British flora, as have those in *Hieracium*. At the present time knowledge concerning them is both fragmentary, and, in many ways, uncertain—and this apart from theoretical considerations of taxonomic status. Bentham and Hooker (2) retain one species with " four principal forms " in the British Isles. No essential changes, apart from nomenclatural ones, are made in the last edition (ed. 7) by Rendle (3). Wilmott (4) has an account which is difficult to follow, but apparently recognizes one major species with about half-a-dozen microspecies. Druce (5) lists 95 names, presumably as specific. Since 1928 a number of other so-called species have been described from the British Isles (39-42, 51). Very briefly, the position is that over a hundred biotypes of *Taraxacum* have been recorded from the British Isles under what are nomenclaturally specific epithets. There is no general published account of these, no uniform contrasting set of descriptions, and no key. How far the names, descriptions, and identifications are valid with reference to British material, apart from the taxonomic status of apomicts, is often uncertain. How far the list given by Druce, even if it be accepted at its face value, really represents a fairly complete sampling of British Taraxaca is unknown. In addition to these practical points there is the very difficult problem of deciding how the biotypes should be taxonomically treated in order to give a classification of greatest general use and most in accord with accepted taxonomic principles.

Before any of the above problems can be solved it is necessary to give full consideration to all known facts which have a direct or indirect bearing on the genus *Taraxacum* itself or upon the wider problems of apomixis and classification of units at or below the Linneon level. The objects of this paper are to bring together the more important litera-

ture, to summarize, all too shortly, what are considered relevant facts, to outline research work now in progress, and to ask for help in continuing and extending this work. Certain practical conclusions are enumerated at the end of the paper.

THE GENUS TARAXACUM.

It is not proposed here to give a full account of *Taraxacum* as a genus, but in order to obtain a fair perspective from which to view more controversial and unsettled problems the following historical and taxonomic data are presented in a summary form.

The name *Taraxacum* was used by Linnaeus (6) in 1735 as a generic name under the hierarchical groups *Syngenesia Monogamia β Semiflosculosi*. In 1753 (7) he used the name *Leontodon* to include *L. Taraxacum* and five other species. *Leontodon* (sensu Linn. *Sp. Pl.*) is now segregated and, by the International Rules, *Taraxacum* Wiggers, 1780 (8) is to be maintained as the generic name of the dandelions. This ruling is convenient in doing away with any argument as to dating the name from Haller (9), who did not use the Linnean binary nomenclature, although later in date than Linn. *Sp. Pl.*

Good generic descriptions are given by Bentham and Hooker (10) and by Handel-Mazzetti (11). The genus is well characterised by the following morphological features: perennial herbs with latex; with perpendicular simple or branched root; old leaf-bases more or less persistent; leaves in a rosette, entire or variously lobed or incised; scapes solitary or several, arising from the crown or the divisions of the crown, simple, usually without scales or leaves; capitulum erect, many-flowered; involucre double, an inner series of phyllaries of equal length in two whorls, an outer series spirally arranged and shorter than the inner; receptacle subplane, naked, areolated; flowers all with androecium and gynoecium superficially fully developed, liguliform; anther lobes acuminate at the base; style bifid; bristles of the pappus denticulate (not plumose); cypselas cylindric or thickly fusiform, longitudinally sulcate, the ribs most often, at least in the upper part, muricate with extended tubercles, usually with a well marked beak, rarely erostrate, more or less contracted at the base.

Morphologically the most closely related genera in the British flora are *Hypochoeris* and *Leontodon*, both of which have the pappus bristles plumose and the cypselas not muricate. *Hypochoeris* also has receptacular membranous scales. *Hieracium* is distinguished generically from *Taraxacum* by the truncated apex to the cypselas. *Crepis*, a genus rather polymorphic in habit and in cypsela characters, is distinguished from *Taraxacum* by the smooth or scarcely rugose ribs of the cypselas.

INTRA-GENERIC TAXONOMY.

The monograph of *Taraxacum* by Handel-Mazzetti (11) and the Nachträge (12) form an indispensable basis for the study of the genus as a whole. Sixty-three species are recognised and these are classified into

ten sections (12). The basis of recognition of species is a reasonable intermediate one between that of extreme lumping and of extreme splitting. The artificial key to the species works well (with a few exceptions) and well-prepared herbarium material (with flowers and fruits) can usually be determined with its aid without undue difficulty. Handel-Mazzetti does not name, or accept as species, the numerous biotypes of *T. officinale* (*T. vulgare*) and of several other of his species. There is no doubt that for many purposes Handel-Mazzetti's classification is, with minor modifications, quite sufficient. While the Scandinavian biotypes of *Taraxacum* have been submitted to intensive studies and can possibly be classified with some degree of finality, it will take many years of research, of a whole-time nature, before the biotypes occurring in the British Isles are discovered, examined, tested, described, and classified with reasonable completeness. Handel-Mazzetti's standard of "species" and scheme of classification are therefore the ones which can best be tentatively adopted by those British botanists who are not making a special study of apomictic genera.

The following " species " are recorded from the British Isles under Handel-Mazzetti's scheme :—

Sect. VII. Borealia.
Subsect. 2. Gymnophylla.
Ser. a. Vulgaria.
42. *T. palustre* (Lyons) Lam. et DC.
43. *T. balticum* Dahlst.
44. *T. officinale* Web.

Sect. IX. Erythrocarpa.
58. *T. laevigatum* (Willd.) DC.
59. *T. obliquum* (Fries) Dahlst.

The following key to the species indicates useful characters for preliminary determination :—

A. Cypselas pale or obscurely brown, grey, or blackish.
B. Outer phyllaries not much broader than the inner and scarcely half shorter, for the most part at least narrowly lanceolate or linear and more than three times longer than broad ..... *T. officinale*
B.* Outer phyllaries, at least for the most part, rather broadly or rather narrowly ovate and rarely up to three times longer than broad.
C. Achenes ± gradually attenuated into a conical cusp with rather small tubercles in the upper part or even nearly smooth. Beak rather slender and usually slightly longer than the cypsela.
D. Leaves succulent, narrow, regularly remotely pinnate nearly or quite up to the middle nerve, lobes linear, entire, spreading. External phyllaries in the marginal part very broadly membranaceous, with a narrow decolorated margin ..... *T. balticum*
D.* Leaves entire or denticulate or more rarely repand sinuate. External phyllaries with a broad decolorated membranaceous margin ..... *T. palustre*

C.* Achenes suddenly or abruptly contracted into a long or short cylindrical cusp, covered above with medium or long tubercles. Beak usually slender and much longer than the cypsela ..... ***T. obliquum***

A.* Cypselas generally intensely red-purple ..... *T. laevigatum*

APOMIXIS.

The cycle of normal sexual reproduction in the Spermatophyta involves two complementary processes: fertilization, i.e., the fusion of a male and female gamete, and reduction, i.e., the halving of the chromosome number of the somatic (ordinary vegetative body) nuclei. The interval (as judged by the number of cell divisions) between fertilization and reduction is long and involves the whole of the life-history apart from the pollen grains and embryo sacs. The interval between reduction and fertilization is correspondingly short. The chromosomes, which in the main constitute the nucleus, are in definite sets, every functional nucleus having at least one complete set. Many complications of chromosome number, structure, and behaviour are now known to cytologists and the terminology in use is not altogether satisfactory. It is essential, in order fully to understand the taxonomic problems of *Taraxacum*, that the following should be made clear: in any individual plant the number of chromosomes in the gamete is the *haploid* number, designated n; the number of chromosomes in the zygote resulting from normal fertilisation is the *diploid* or $2n$ number, and this, of course, is the usual number in all the vegetative nuclei up to reduction; a chromosome set is conveniently designated x; polyploidy is a multiplication of chromosome numbers or sets; confusion can best be avoided by using symbols—n, 2n, 3n, 4n, etc., or x, 2x, 3x, 4x, etc., according to whether the polyploid evaluation is based on the actual haploid number of an individual or on the basic chromosome set. The terms diploid (2n, 2x), triploid (3n, 3x), tetraploid (4n, 4x), etc., have been used in two senses.

In many plants ordinary sexual reproduction (*amphimixis* of Winkler) has been replaced or, more often, supplemented by other methods of multiplication. Winkler (13) gave the term *apomixis* to these and recognised the following three groups of kinds: vegetative propagation (including the adventitious formation of embryos from nucellar cells), apogamy (the origin of an embryo sporophyte from the vegetative cells of the gametophyte, i.e., from a cell or cells other than the female gamete or egg), and parthenogenesis (the origin of a sporophyte from the female gamete without fertilization). It is important to note that either parthenogenesis or apogamy may be carried through with one (n) set of chromosomes or with more than one. In flowering plants diploid apogamy or diploid parthenogenesis is commoner than haploid. That is to say, the embryo develops without fertilization from a cell which structurally belongs to the gametophyte but has an unreduced number of chromosomes. It should further be realized that in seed-bearing plants apogamy and parthenogenesis can, and often do, result in the production of seeds with full viability and morphologically indistinguishable from amphimictically produced seeds. It is impossible to determine

apomixis without experiment or cytological examination of the essential parts of the life-history.

Winkler's simple scheme has been enlarged and modified, with certain changes in terminology and definition, by more recent authors. The reader is referred to Darlington (14, ch. XI) for a fuller modern account.

APOMIXIS AND CYTOLOGY IN TARAXACUM.

Schwere (15) studied the development of the embryo and fruit in "*Taraxacum officinale.*" He did not recognise apomixis as such, although it is probable from his account that he actually observed it. He says he long sought without result to find a stage in his preparations showing union of male and female gametes, though, he claims, he saw in some sections the end of a pollen tube in fertilised embryo sacs. His figure of this is not convincing and, it may be suggested, the supposed end of a pollen tube really represents a degenerating second synergid. Further, his record of fertilization (Befruchtung) of a synergid is really an example of apogamous development of one of the two synergids, proceeding, as illustrated in his figure, with parthenogenetic development of the egg, that is apogamy and parthenogenesis are occurring in one and the same embryo-sac.

The first clear demonstration of apomixis in *Taraxacum* which has been traced is that by Raunkiaer (16) for Danish dandelions. Using the same "castration" methods as employed at about the same period by Raunkiaer and Ostenfeld (17) for *Hieracium* and other Cichoriae, Raunkiaer showed that viable seeds (one seed inside each inferior indehiscent fruit or cypsela) are set even after the anthers and stigmata have been removed before anthesis by cutting through the capitulum in bud at a sufficiently low level. Raunkiaer experimented with a sufficient number of biotypes to reach the conclusion that probably all the Danish Taraxaca are apomictic.

Murbeck (18) studied the cytology of castrated heads of two stocks, which he named *T. vulgare* (Lam.) Raunk. and *T. speciosum* Raunk. He recorded the large size of the egg, embyro formation without fertilization from the egg in more than 90 per cent. of the florets, and that, in uncastrated heads, embryo formation, at least in the late autumn, can commence in florets before they open. *T. vulgare* (Lam.) Raunk. produces abundant, though for the greater part "bad" pollen grains; *T. speciosum* Raunk. has empty anthers.

Juel (19, 20) for "*Taraxacum officinale*" found that in young ovules the embryo sac mother cell divides only once, *i.e.*, without full tetrad formation. The basal daughter cell develops into an embryo sac without any reduction in the chromosome number of its nucleus. The chromosome number was determined as most often 24-26. The pollen mother cells (in the material used) gave rather regular tetrad divisions with 12-13 as the reduced chromosome number. Juel finally accepted $n=13$, $2n=26$ as the most probable numbers.

Research at this stage clearly showed that many north-western European Taraxaca were apomictic and the question arose as to whether sexual reproduction had entirely disappeared from the genus. Investigations by Rosenberg (21), Ikeno (22), and Osawa (23) answered the question in the negative. Rosenberg found definite tetrad formation in the embryo sac of *T. confertum* with many stages in the reduction of the chromosomes to n=8. A pollen cell with 8 chromosomes was also seen, while 16 chromosomes were seen in somatic divisions. Actual fertilization was not observed. Ikeno (following unpublished results of Tanaka) castrated heads of *T. albidum* Dahlst. and *T. platycarpum* Dahlst., two morphologically distinct biotypes occurring in Tokio. The former produced abundant and the latter no viable fruits after the treatment. Additional controlled pollination experiments were also made. It was concluded that *T. albidum* was apomictic and *T. platycarpum* amphimictic. Osawa confirmed Ikeno's experimental results with *T. albidum* and *T. platycarpum*. Cytological examination showed n=8 and 2n=16 for *T. platycarpum*. There is normal tetrad production in both pollen grain and embryo sac formation. The chalazal megaspore of a row of four becomes the embryo sac. In *T. albidum* irregularities at the formation of the pollen lead to disintegration or absence of viability of the grains. The embryo sac mother cell undergoes no reduction division and produces only two megaspores, of which the one towards the chalaza becomes the embryo sac. The chromosome number was determined as between 36 and 40. The egg developed parthenogenetically.

Sears (24, 33) and Stork (25) report a series of experiments, observations, and cytological investigations which, on the whole, confirm the work of earlier workers and with them indicate that the majority of Taraxaca are apomictic.

A series of papers giving an account of recent cytological researches has been published by Åke Gustafsson (26-32). These researches very considerably extend our knowledge of the cytological details and apomictic behaviour in *Taraxacum* and it is desirable to summarize very briefly some of the more important facts and conclusions. Castration experiments with biotypes belonging to the groups Vulgaria, Erythrosperma, Obliqua, Spectabilia and Ceratophora gave entirely positive results (26) and showed that sexual biotypes must occur very infrequently, if at all, in the populations studied. The basic chromosome number is clearly shown to be x=8. The group Vulgaria is triploid (2n=24); Erythrosperma is triploid and occasionally tetraploid; Palustria is tetraploid; Obliqua is triploid; Spectabilia is tetraploid and occasionally pentaploid; Ceratophora is triploid and tetraploid; Arctica is probably hexaploid. *T. minimum* (? *megalorrhizon* Hand.-Mazz.), *T. serotinum*, and *T. bessarabicum* were found to be diploid. The polyploidy is found to be allopolyploidy, *i.e.*, presumably having originated in connection with primary hybridization.

In a biotype of "*T. officinale*" pollen sacs were observed with increased chromosome numbers (from 24 to 76) in the pollen mother cells

(27). The increase comes about through repeated divisions of chromosomes without dissolution of the nuclear membrane. Only gemini were observed and loss of genes is postulated as the cause of suppression of pairing and of degeneration of the male apparatus. Satellites are recorded in pollen mother cells (28). In apomictic biotypes (apomicts) formation of the embryo sac (after one division of the embryo sac mother cell) is much more regular than the formation of pollen grains and the male organs appear to have lost genes controlling their normal development and the superfluous reduction division has often ceased or taken on a mitotic character (29). Apomicts morphologically distinguishable as biotypes occur with different frequencies in different groups. They are most numerous in Vulgaria. The details of their geographical distribution (mainly studied for Scandinavia) reveal many matters of interest and suggest that the Taraxaca biotypes furnish excellent material for studies connected with past and present climates, phytogeographical boundaries, and ecological units (30), as well as for the cytological phenomena connected with parthenogenesis (31). Finally, the cytology of a polymorphic "microspecies," of the Vulgaria group, named *T. obtusilobum* Dahlst., is shown to be diploid (2n=16) and to form a self-sterile population which survives in nature only by means of cross-pollination. Crosses, giving fertile hybrids, were made between *T. obtusilobum* and other biotypes and a probably spontaneous hybrid is also described (32).

PHENOTYPIC PLASTICITY OF GENOTYPES IN TARAXACUM.

The taxonomist nearly always classifies phenotypes. Plants as living organisms are, however, dynamic, changing their characters, within certain ranges, with age and with the environmental conditions to which they are or have been, or more rarely to which their parents have been, subjected. The taxonomist, therefore, attempts, often with great success, to describe, use, or emphasize those characters which are relatively constant, *i.e.*, those least affected by natural changes in the environment and which are regularly expressed by, usually mature, organisms of the same genotype. Extensive and intensive experience undoubtedly enables the trained taxonomist to evaluate characters from this standpoint with a precision which has often seemed uncanny to workers in other branches of botany. In certain groups of plants, however, this method is recognized to be unscientific, particularly in such cryptogamic groups as the bacteria and fungi. Two methods can replace it. Either the age and environmental life conditions of the material described and classified can be stated or, the ideal, the full life-history under all possible varying conditions can be described. Neither is an easy task and the latter can only be approximately completed.

Species and genera vary greatly in their degree of plasticity under varying natural conditions. This has been clearly shown in the Transplant Experiments of the British Ecological Society at Potterne, Wiltshire. *Taraxacum* must be placed among the more plastic genera and this character is undoubtedly one of the numerous difficulties the taxonomist

has in attempting to identify and classify either the " species " of the standard of Handel-Mazzetti or the biotypes of the standard of Dahlstedt. This matter has been discussed by earlier writers. Sears (33) summarizes the observations and experiments of earlier authors and adds valuable data to them. Griffith (34) also deals with periodicity in leaf-form. The following account is mainly based on unpublished observations and experiments which are still in progress at Kew. I have to thank Miss W. Curtis, B.Sc., for allowing me to refer to research she is doing on Kew material.

Taraxacum has, like all other plants, certain advantages and certain disadvantages as experimental material. It is easy to transplant at any time of the year, it can be quickly multiplied by crown cloning, seeds germinate quickly, and a fair percentage can be germinated within a week of ripening. All the species and biotypes so far tested, with only a few exceptions, grow well at Kew, though some survive longer than others. New roots are readily and quickly produced. Since all the British biotypes so far tested produce seed apomictically their seed offspring are (in the absence of somatic mutations) the genetical equivalent of a clone. On the other hand the absence, in all so far studied British Taraxaca, of sexual reproduction prevents any genetical research by selfing and crossing. The rosette hemicryptophytic habit, with the terminal " perennial " bud or buds at ground level, increases the technical difficulties of manipulating the bud and young leaves. At Kew the stock plants are grown in the Experimental Ground in rows under conditions of soil and microclimate as uniform as it is possible to make them under garden (as distinct from laboratory) conditions. Experiments under various controlled conditions are being carried out but these are contrasted with and are supplementary to the investigations on uniformly treated biotypes. A large collection of herbarium specimens has been preserved as a permanent record and is being added to every year.

One fact has emerged with great clearness. There is no doubt whatever of the morphological distinctness of numerous biotypes. These have a genetic basis as is shown by the uniformity of plants in rows from single heads of seeds and the obvious differences between rows. Further, but of supreme importance, these differences change with age—absolute and seasonal. In studying plasticity of any one genotype three sets of factors influencing morphological expression have to be kept in mind: 1, different environmental conditions (moisture supply, temperature, light, soil, etc.); 2, differences of season; 3, differences of age of the material. For the last it is also necessary to distinguish age from the seedling and age from rejuvenated crowns.

All parts of the plant, and especially the leaves, show plasticity. The long roots commence as simple tap-roots but soon branch laterally and, with increasing age of the plant, branch multicipitally. The degree of multicipital branching varies also with the biotype and, to a certain extent at least, with the soil. Some old plants (5 to 6 years old) can be

dug up as physiological units, others of the same age will separate into several to numerous parts when removed carefully from the soil. In all transplant experiments the "individual" is considered as that seedling or ramet growing physiologically independent on its own root system.

The stem, terminating in the bud, consists of the growing point and presumably the top part of the "crown." There is no clear demarcation between root and stem and investigations on the development of the "crown" from the seedling have not yet been completed.

The leaves form the greater part of the vegetative body visible in growing plants *in situ*. The differences in size, outline, shape, lobes, teeth, colour, and indumentum of these organs from genotype to genotype of uniform age and cultivation is very great indeed. The difficulty the taxonomist has to face is that these differences are themselves dynamic and plastic. In many stocks senescence, at least for a time, increases degree of lobing or dissection in a seedling plant, ramet, or even attached crown and, often, independent of actual leaf size. In other stocks absolute age, from seedling, decreases the amount of leaf-lobing. Leaves themselves influence the shape of younger leaves and quite different shapes can be obtained in some stocks at any growing season by removing older leaves. Preliminary experiments suggest the controlling influence of hormones. Griffiths (34) has suggested that periodic changes in leaf-form may be due to changes in the pressure of water-supply. An experiment at Kew with one stock only gave negative results, but is not considered conclusive. With seedling plants light has been shown (with two stocks) to cause marked changes in leaf lobing. Plants grown in full open daylight have much more dissected leaves than plants (of the same stock, same age, watered equally, and in the same kind of soil) grown in the shade. Experiments to test the influence of different chemical and physical conditions of the soil on leaf-shape are not yet sufficiently advanced for the results to be given.

Stout or slender peduncles are characteristic of certain biotypes grown under uniform conditions, but length is highly plastic. Occasional abnormalities occur both in the wild and in cultivation. The peduncle may bear one or more leaves or structures intermediate between foliage leaves and phyllaries. Fasciation, even to an extreme degree, is to be found in a few plants (one out of 500 to 1000) in most years. The shape of the capitulum as a whole and its size (maximum, minimum, mean, and standard deviation, as based on diameter measured for a sufficiently large and fair sample) give important characters.

The phyllaries are frequently used as giving taxonomic criteria of high value. The plasticity of these organs requires further study.

Flower characters are important but certain of them require more statistical treatment than they have so far had. Experience at Kew suggests that flower colour is often taxonomically reliable but must be judged from living material at full anthesis. "White," pale yellow, deep yellow, and certain markings come true from seed and distin-

guish certain biotypes. The number, length, and shape of the florets also show differences as between the genotypes. The presence or absence of pollen and especially the occurrence and percentage of "good" pollen has a certain value, as shown by the cytological researches summarized above. On the other hand, the degree of pollen production certainly fluctuates in some genotypes.

The cypselas are given considerable importance by all taxonomists who have worked on *Taraxacum*. Size, shape, colour, cusp, beak, spine and tubercle outgrowths, ribs, pappus length, and colour have all to be considered. As studied at Kew cypsela characters, for any one stock, show less fluctuation than do vegetative characters. Certain groups, especially some non-British ones, are clearly differentiated by cypsela characters. At the same time two difficulties have to be recognized. Cypsela characters are not constantly associated with other characters and they may be of little use in separating biotypes belonging to the same group. Thus Handel-Mazzetti (11, p. 116) places *T. obliquum* (Fries) Dahlst. in the group Erythrocarpa because of its great similarity in most characters to *T. laevigatum*, but it has "achaenia pallide griseo-brunnea!" A similar difficulty has been met with at Kew in studying certain biotypes from Thrace. Lindberg (35) states that about 200 "Arten" of *Taraxacum* are now known from Finnland and he figures two or three fruits of 331 stocks. Even allowing for the fact that the figures are in black and white outline only and do not show features of colour or surface it is evident that the differences between, combined with fluctuations within, the stocks make determination from cypselas alone within the (by far the largest) group Vulgaria impossible.

Lastly, we must consider briefly general habit and size. Again, the same general features hold. Plants of the same stock, of the same age, with the same treatment, show remarkable uniformity and often marked differences from genotype to genotype. Such genotypic differences are particularly conspicuous in seedling plants in their first and second years. The size of the plants, the orientation of the leaves (flat, spreading, suberect, erect), and the persistence of the leaves is constant for the genotype though varying with age of the plants and with the season of the year.

The general result of preliminary studies is that numerous biotypes, microspecies, or whatever they may be called, are real genotypic entities morphologically different one from another. Unless, however, the highly plastic nature of the characters, particularly of the foliage, be taken fully into account taxonomic descriptions, classification, and nomenclature lead to hopeless confusion. There is a further technical difficulty of describing adequately so highly and peculiarly lobed or otherwise divided a leaf as is found in many of the biotypes. Undoubtedly the biotypes of *Taraxacum* are extremely numerous and probably run well into three figures for the British Isles. For some purposes it is not necessary to distinguish them, for others it is. The fact remains that the methods of description—often of one or a few specimens, some-

times from dried material only—make it impossible to determine, with certainty and from the descriptions only, many of the biotypes given, for example, in such a list as Druce's, or from the descriptions published in the B.E.C. Reports by Dahlstedt (36 to 42).

THE BIOTYPES.

We have seen that in *Taraxacum* there are many morphologically different groups that come true from seed (unless mutations occur). It is a high probability that the large majority of British Taraxaca are apomictic. No British *Taraxacum* has yet been found to be amphimictic at Kew, and no published record has been found of a proved British amphimict in the genus. On the other hand, certain foreign Taraxaca have been experimentally shown to be sexually reproduced (amphimictic). While, therefore, it may sometimes be convenient to refer to those British Taraxaca which have been experimentally proved to be multiplied apomictically as apomicts, it has been considered advisable to use the more non-committal term " biotypes " for the morphologically different groups. In any theoretical discussion of the status of these biotypes it is, of course, of the greatest importance to remember that they are (at least, for the most part) apomicts.

Over 100 of these biotypes have been recorded or listed as occurring in the British Isles. The value to be attached to the names given (as in Druce's List) is at present doubtful and it is not the purpose of this paper to attempt to deal with the details of biotype nomenclature. It has, however, been thought useful to enumerate the main characters used by Dahlstedt, who has been mainly responsible for the names (as applied to British plants) in the B.E.C. Reports and in Druce's List, in describing (as species) the biotypes of *Taraxacum*. There is also given a key to the sections, modified from one of Dahlstedt's publications.

The following characters are those particularly used by Dahlstedt in distinguishing British biotypes from one another:—

Leaves: shape; flat or involute; entire, dentate, or lobed; shape of terminal lobe, laciniations, and teeth; green or grey-green; spotted or not; midrib and petiole coloured or not; hairy or glabrous.

Pericline (calathium) and involucre: large, medium, or small; shape and size of bud.

Phyllaries: shape and colour; with or without horn or callose development; with or without white margin; outer adpressed, spreading, or reflexed.

Corollas: colour (especially light or deep yellow); marginal ligulate florets with or without a coloured line.

Anthers: with or without pollen.

Styles: dull-coloured or clear yellow.

Cypselas: broadest at, above, or below middle; colour; degree of spine or tubercle development.

Pappus: length, colour.

KEY TO THE SECTIONS OF BRITISH TARAXACA, ADOPTED FROM DAHLSTEDT, 1921.

A. Achenes red ..... Erythrosperma
AA. Achenes dark green—fuliginose or grey-, greenish-, or dull straw-coloured to more or less chestnut-brown.
  B. Inner phyllaries on the outside below the apex long or at least conspicuously horned, outer long horned or shortly horned-callose ..... Obliqua
  BB. All phyllaries neither horned nor callose or the inner rarely (and a few of the outer very rarely) callose.
    C. Outer phyllaries broad, more or less ovate, adpressed, more or less marginate. Cypselas large; cusp long, cylindrical; beak short. Leaves narrow, entire or shortly dentate or with narrowly spreading, linear, distant lobes ... Palustria
    CC. Outer phyllaries ranging widely in width and direction (adpressed, spreading, recurved, or retroflexed). Leaves broad, variously lobed or incised.
      D. Cypselas large with conical cusp, commonly short, 4-6 mm. long; beak 1.75-2.75 (rarely 3) times longer than the cypsela ..... Spectabilia
      DD. Cypselas small or mediocre, with a usually short cusp, 3.5-4 mm. long; beak 2.5-3 mm. longer than the cypsela ..... Vulgaria

ECOLOGICAL AND PHYTOGEOGRAPHICAL EVALUATION.

It is important to remember that in the British flora Taraxaca occur in two main kinds of habitat: 1, as weeds of disturbed ground and as ruderals in the broadest sense of the term, and 2, in natural or semi-natural habitats, often in closed communities. In the first are found many of the biotypes of the Vulgaria section, in the other most of the recorded biotypes of the other sections known from the British Isles, and also some of the Vulgaria section. The distinction between the two kinds of habitat is, of course, not always sharp, but can generally be recognized.

Field-work in connection with the studies at Kew has not yet been sufficiently extensive or intensive for more than tentative conclusions to be drawn from it. There is no doubt that *Taraxacum* populations are, on the whole, different in different parts of the country. Thus collections from Aberdeenshire gave apomicts (grown from seed at Kew) very different from any so far found in the south of England. There is also a decided ecological difference between some, at least, of the sections. On the other hand, several to many biotypes of the Vulgaria section often grow together in the same field or on the same small area of waste ground. Many of the Vulgaria biotypes are neither phytogeographically nor ecologically differentiated from one another. In this respect they resemble what are usually termed varieties or are left unmentioned and unnamed as character combinations within a polymorphic sexual species. What is likely to be a matter of considerable interest, both in the actual accumulation of data and in results, is to determine exactly the geographical and ecological distribution of the apomicts separately and then to define their overlapping.

ORIGIN OF THE BIOTYPES.

The available evidence, especially the cytological, suggests that sexuality was formerly of general occurrence in the genus, that hybridization combined with polyploidy gave rise to a number of phenotypes, and that subsequent mutation has been, and perhaps still is, the origin of many of the numerous biotypes now known especially from N.W. Europe. The majority of described biotypes belong to the Vulgaria section, and nearly all investigated members of this section are triploid ($2n=3x=24$). It is unlikely that all these biotypes arose separately as the result of hybridization or of abnormal chromosome behaviour. It is probable, though not fully proved, that somatic (and especially perhaps zygotic) mutations occur now and again and give rise to new biotypes, which, retaining apomixis, are already stable, in the sense of coming true from seed. Such mutations have been recorded for other apomictic genera, including *Hieracium* (see 14, pp. 474-5) and *Rosa* (43).

It is appropriate here to recall that Weiss (44) recorded a " quilled " dandelion from a field near Manchester. The name *Taraxacum officinale*, var. *cucullatum*, was given to this biotype, which was proved by castration to be apomictic and whose characters came true in seedlings. Weiss points out that " this peculiar mutation has been recorded several times from the Continent." He also suggests that " the occurrence of a similar mutation in different countries (Tyrol, Switzerland, Britain) and arising from at least two distinct species of a genus is a matter of some interest, and has some bearing on the origin of " corresponding " species of plants and animals in different parts of the world."

No mutations in apomictic Taraxaca have yet been definitely obtained in the Kew experiments. Up to the present, over a period of 8 years, only some 4000 plants have been grown and studied in this series from over 100 stocks. This number is almost negligible in relation to the enormous seed output of which a single plant is capable. Roberts (45) gives " an average possibility of 23,436 seeds per plant growing under what may be termed nearly maximum conditions, when in full bloom," for one season only.

One other matter should be mentioned here. Experiment has shown beyond doubt that many *Taraxacum* biotypes are facultatively apomictic. Cytological evidence supports the further conclusion that many of them (especially in the section Vulgaria) are obligatorily apomictic. There is, however, the possibility that some biotypes are occasionally amphimictic, at least partially. That is, fertilization may possibly occur in a few florets here and there. It is hoped to carry out some experiments at Kew which may throw some light on this problem. In nature, insects frequently visit the open heads in considerable numbers. Lists of insect visitors are given by Schwere (15) and, with numerous bibliographical references, by Knuth (46). Casual or facultative apomixis is probably of much commoner occurrence than is known in many genera and the reverse; the casual occurrence of amphimixis in mainly apomictic biotypes is not unlikely if an egg with haploid chromo-

some number were occasionally formed and its floret pollinated with viable pollen, perhaps from another stock. Again, the enormous number of florets produced, whether estimated per plant or per acre of dandelion infested ground, gives a fair statistical chance of the unusual actually happening at fairly frequent intervals. Biotypes produced by mutation or by hybridization have, of course, to pass the sieve of natural selection before they become established.

A careful study of plants derived from seeds of heads flowering at unusual times might lead to the observation of mutation actually occurring in *Taraxacum*. Extreme conditions (as temperature) is known to increase mutation rate in some organisms. Taraxaca do not, in the writer's experience, generally flourish well in pots in heated greenhouses, and potted plants are easiest to handle for experimental purposes. However, flowering occurs sometimes out of the ordinary in the open ground. Thus, many seedlings do not flower the first year, but some do. This is partly a biotype character, partly an individual fluctuation. Some plants flower twice, in the spring and again in the autumn. Early and late seeds need testing separately in the search for mutation, as do seeds from very young and from very old plants.

POPULATION STUDIES.

The method of collecting dandelions adopted by some botanists leaves much to be desired. The selection of " typical " plants and the ignoring of all that do not fit into a more or less preconceived notion of distinctness gives a false impression of what actually occurs in nature. Further such statements as " I can match a dozen of Dahlstedt's species on my lawn," when unsupported by full evidence, reflect adversely on the speaker or writer rather than on Dahlstedt. Sufficient preliminary observations and experiments have now been made at Kew to show the desirability of detailed examinations of populations of *Taraxacum* combined with as much cultural research as space and time allow. Herbarium methods are essential but by themselves quite insufficient for solving the problems of British Taraxaca, even from a taxonomic standpoint alone. The difficulties of field work are very great owing to the plasticity, with age and micro-habitat, of every biotype. By a combination of methods they can be gradually overcome.

Preliminary studies make it clear that populations in natural or semi-natural habitats are much more uniform (biotypically) than disturbed, waste, or ruderal areas. A sand-dune area, a chalk-grassland, or a limestone ridge has, within the limits of the writer's experience, a much less diversified dandelion population than many a much smaller area of broken field, waste ground, or newly made up railway embankment. Sukatschew (47) has shown how a biotype from the Crimea failed at Leningrad and how three different biotypes from the same lawn at Leningrad behaved very differently in dense and sparse, mixed and pure cultures. In the south of England biotypes of the section Erythrosperma often occur in closed chalk or limestone grassland uniformly

over considerable areas. Arable land reverting to rough pasture or a derelict building plot will usually yield several biotypes of the Vulgaria section.

FUTURE RESEARCH.

In a flora so well known in general outline as that of the British Isles future research must be a concentration on special problems on more intensive lines and by other methods than are at present popular. It is probable that any genus with a fairly wide distribution has much of interest to yield to such intensive research, especially if it can be carried out by the co-operation of persons trained in different branches of botany but on the same material. The taxonomist, the cytologist, the histologist, and the ecologist have much to gain by such co-operation. Such research will not only throw additional light on the constitution, origins, and history of the British Flora but it will also yield other results of wide biological importance. While no superior claim is made in this respect for *Taraxacum*, it is hoped that it has been made clear that the genus offers excellent material, in some important ways different from that provided by most other genera, for concentrated investigation, much of which can be carried out without undue expense.

It is suggested that research should include the following:—

1. A careful investigation of wild populations on a statistical basis. Account should be taken not only of the biotypes present and of the proportional and actual numbers of their individuals but also of their thickness on the ground and their age and habitat plasticity. The populations chosen for investigation should at first be small and clearly delimited but areas should gradually be increased in size.
2. More extensive field studies undertaken with the aim of tracing the geographical and ecological ranges of biotypes. The morphologically better differentiated biotypes should be investigated first.
3. Character-combinations and character distribution should be carefully recorded with all relevant details.
4. Evidence for mutations, sexuality, and hybridization should be sought.
5. Cultural experiments by growing rows of plants from seeds from single heads should be carried out to the limit of available space and time. Records should be kept, by means of notes, photographs, and series of fully annotated herbarium specimens, especially of age and seasonal plasticity. At Kew, for seed-production, the flowering and fruiting heads have to be protected from sparrows. These birds will attack and eat out the immature fruits from ripening heads and will crack open and extract the seed from ripe cypselas in a very neat manner.
6. Castration experiments should be made on all biotypes in the cultures. In making these certain precautions have been found necessary. A sharp razor-blade and a straight cut across the unopened

fairly young capitulum at a sufficiently low level will remove anthers and stigmata without damaging the ovary. After this operation the cut heads must be protected from desiccation by covering the plant with a bell-jar or flower-pot and sometimes protection from ants and slugs is necessary.

In all experimental work the utmost care in the numbering of plants and rows is necessary. It is also essential to keep a close watch for " rogues " and to remove them and any doubtful plants as soon as they are noticed.

THE TAXONOMIC STATUS AND NOMENCLATURE OF THE BIOTYPES.

The most diverse opinions have been expressed, and put into practice, regarding the status of *Taraxacum* biotypes. If they be treated as species, subspecies, or varieties the International Rules of Nomenclature apply to their naming. There are, however, real difficulties in accepting the usual, and for most genera and many purposes the fairly practical, taxonomic hierarchy of species and intraspecific categories. From the standpoint of genetic isolation the biotypes are species; from the standpoint of character-combinations, morphological differences and similarities, and ecology, the biotypes, within any one section and within any one distributional area at least, are varieties of one or a few species. There is little doubt that if they were sexually reproduced they would be considered as varieties (of one or a few species) or merely regarded as various segregating character-combinations. The widespread and regular occurrence of apomixis puts them into a category distinct from " species " and " variety." Most systematists acknowledge that species and varieties are not categories of uniform taxonomic (or any other) value, but many do try to make them as uniform as possible for any one line of research. Hence it seems really desirable, in order to clear the orthodox taxonomic categories in a slight degree, to exclude the known or reasonably probable apomicts. On the other hand, they cannot be ignored by the taxonomist studying a flora so well known as that of the British Isles.

The International Rules of Nomenclature state that every plant must belong to a species, unless it be a hybrid between two species or a chimaera. Unfortunately it is not clear whether by " hybrid " is meant an F_1 only or whether segregates and backcrosses are included. On one interpretation there are probably very few " species " indeed in the British Flora!

Turesson (48) has suggested that the term *agamospecies* should be given to " an apomict-population the constituents of which, for morphological, cytological or other reasons, are to be considered as having common origin. (Illustrated by *Alchemilla vulgaris*, *Antennaria alpina*, etc.)." Again (49), it is stated " According to Turesson, however, *Potentilla argentea* is to be considered as an asexual species, an agamospecies, within which it is possible to delimit a number of *formae apomictae*."

This scheme is theoretically, and for some apomictic groups probably practically, a considerable advance on any previously suggested. The difficulty of applying it to British Taraxaca, with our present state of ignorance, is in defining the limits of the agamospecies into which the biotypes (formae apomictae) should be grouped. This difficulty may well be resolved with increasing knowledge, and tentatively, as a preliminary working scheme, the recognised sections might well be considered as agamospecies. A less important objection is to the use of the term "formae." Some authors have used the term "formae" for phenotypes owing their distinguishing characters to the action of environmental factors on one genotype. The Taraxaca biotypes are different genotypes.

Du Rietz (50, p. 362) distinguishes "four main types of species." Two of these concern us here. The *simple asexual species* includes the individual *Taraxacum* biotypes. The *compound asexual species*, or "species consisting of several, practically indistinguishable, strictly asexual biotypes." To this type belong "many of the more widely distributed apomictic species of *Taraxacum*." This scheme postulates two taxonomic units, both designated "species" within the genus *Taraxacum*. It is not quite clear whether a "compound asexual species" can include several to many "simple asexual species," *i.e.*, a species is also an intraspecific unit (which is terminologically absurd), or whether there are two grades of biotypes within the genus—1, distinguishable; 2, practically indistinguishable. For British Taraxaca it seems a much simpler and more practical scheme for obtaining data in an unbiased manner to use only the term biotype, or the term apomict where the biotype has been experimentally proved to be apomictic. For convenience the biotypes can be grouped into sections or (more or less presumed) agamospecies.

It is, then, suggested that a scheme of the following kind be *tentatively* adopted for the collection of data:—

Section Vulgaria.
(Agamospecies) *Taraxacum officinale.*
Biotypus *adiantifrons.*
,, *alatum.*
,, *alienum*, etc.

Section Erythrosperma.
(Agamospecies) *Taraxacum laevigatum.*
Biotypus *brachyglossum.*
,, *decipiens*, etc.

(Assuming the names and identifications of Druce's List, for the biotypes, are correct, as some of them may be).

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GLOSSARY OF TERMS.

Allopolyploid: Having some multiple of unlike chromosome sets; whence allopolyploidy.

Amphimixis: Reproduction by a normal sexual process, *i.e.*, by the fusion of a male gamete with a female gamete to produce a zygote.

Apogamy:	The development of some cell of the gametophyte (in Angiosperms within the embryo-sac) other than the female gamete (egg) into an embryo.
Apomict:	An individual produced by a process other than normal sexual reproduction.
Apomixis:	Production of individuals (including mere multiplication and reproduction) by a process other than that of normal sexual reproduction.
Aposporγ:	The elimination of spore production in the life history (also involving elimination or reduction of chromosome numbers).
Biotype:	A group of organisms of identical genetic constitution.
Chimaera:	An individual from the standpoint of physiological behaviour which, however, is composed of tissues of more than one genetical constitution.
Chromosomes:	The units of structure appearing at division of the nucleus.
Cytology:	The study of the detailed structure and behaviour of cells.
Diploid:	Having two sets of chromosomes.
Gamete:	A specialised cell functioning immediately in fertilization; whence gametic.
Genotype:	The genetic constitution of an organism.
Haploid:	Having only one set of chromosomes.
Hemicryptophyte:	A plant with perennating buds at or just below ground level.
Hexaploid:	Having six chromosome sets.
Megaspore:	(For *Taraxacum*), a young embryo-sac or a potential embryo-sac.
Parthenogenesis:	The development of an embryo from a female gamete (egg) without fertilization.
Pentaploid:	Having five chromosome sets.
Phenotype:	The definition of an organism as represented by its visible or demonstrable characters.
Polyploid:	Having some multiple of chromosome sets; whence polyploidy.
Soma:	The body, as distinct from the gametes or reproductive cells; whence somatic.
Synergid:	One of the two cells of the gametophyte closely associated in the embryo-sac with the female gamete.
Tetraploid:	Having four chromosome sets.
Triploid:	Having three chromosome sets.
Zygote:	The immediate product of fusion of a male and female gamete; the young embryo; whence zygotic.

THE VARIABILITY OF ELM FOLIAGE AND THE COLLECTION OF ELM MATERIAL FOR HERBARIA.

R. Melville, F.L.S.

The British elms have always been a source of difficulty to botanists, partly on account of the variability of the foliage even in a single individual and partly because of the ease with which the trees hybridise and produce fertile progeny. The classification of such hybrid swarms provides a difficult problem for the taxonomist and one which it is not proposed to discuss here. In making a critical survey of our native elms the question of the variability of the foliage was one that called for careful study. The method of collecting material of elms outlined below was devised to minimise the variability and facilitate the comparison of related forms.

The necessity for comparing foliage from the same type of shoot when studying elms has not been realised sufficiently in the past. Foliage of the normal branches of an adult tree differs considerably from that of epicormic shoots, proleptic shoots, and sucker shoots of the same individual. It may be as well, at this stage, to define the terms just used.

Epicormic shoots are vigorous shoots arising from the trunk and occasionally from the larger branches. They develop from dormant buds and possibly from adventitious buds, and are especially noticeable on trees that have had their lower branches lopped. Epicormic shoots are of common occurrence on elm trunks, giving rise to "the brushwood sheaf round the elm-tree bole," as Browning aptly describes them. The leaves on such shoots are more variable in size and in shape than those of normal shoots and always appear more hairy. This depends on the greater length of the simple hairs and the replacement of some or all of the glandular hairs found on the leaves of normal shoots by simple hairs. In successive years the foliage of epicormic shoots gradually changes and becomes more and more like that of normal shoots, but epicormic shoots ten to fifteen years old are often not quite normal from this point of view. This fact is important since in many cases only the foliage of such old epicormic shoots is within reach of the collector. It is essential, therefore, that if such shoots are collected the fact should be stated.

Proleptic shoots, sometimes called "Lammas shoots," are secondary growths prolonging the normal adult branches of a tree and developing after the normal growth in length for the year has ceased. The leaves of these shoots differ from normal shoots in shape and roughness. They may be compared only with similar shoots of other trees and in some cases may give a hint of the parentage of hybrid forms.

Sucker shoots arise below ground level and often on roots at some distance from the parent trunk. As with epicormic shoots, the simple hairs on the leaves and also on the branchlets are longer and more

numerous than on normal branchlets and their leaves, and the glandular hairs are less numerous. The size of leaves on suckers varies enormously from two or three times that of normal shoots on vigorous examples to very much smaller on shaded and starved branchlets. In shape the leaves are often subequal at the base and generally quite different from those of normal shoots. Owing to the wide range of form in sucker leaves of individual trees and the great similarity of suckers from several species, such shoots are not of much value in classification. Nevertheless, many elm specimens of 100 years or more ago in our national herbaria consist of a sucker shoot only and that often a starved branch with small leaves. Specimens of the latter kind are often labelled "*Ulmus minor*."

With the epicormic, proleptic, and sucker shoots disposed of, there remain the normal adult shoots to consider. These exhibit a fair degree of variability, though less than in the other types. How can this variability be reduced to a minimum? To answer this question we must dissect our normal shoots.

The normal shoots of a tree, in the above sense, include all the adult branchlets forming the crown of the tree. If one of the branches is examined it is found to end in a more or less elongated terminal leafy shoot. Along the branch are lateral shoots of varying sizes ending similarly in elongated leafy shoots. These longer laterals bear small lateral shoots that may be called "short shoots," having usually about four to six leaves. A little consideration will show that the "short shoots" bear the bulk of the foliage of a tree, and on examination it will be found that variability is least in shoots of this kind. The conclusion may be drawn, therefore, that the short shoots will be the most valuable for taxonomic study, and in the writer's experience this is so. The terminal shoots are more variable and correspondingly less valuable.

To make the point clear, reference may be made to the excellent figures of elms in Butcher and Strudwick's *Further Illustrations of British Plants*. Here under "*U. campestris* L." are two typical short shoots of the English Elm, *U. procera* Salisb., though the artist appears to have omitted the distal leaves. These represent the normal foliage of the tree and the type that strikes the eye. The plates of *U. nitens* Moench and *U. stricta* Lindl. each show terminal shoots and do not represent the bulk of the foliage. They can be compared with one another, but not with the short shoots shown for *U. procera*.

From a consideration of the above argument, it is evident that to represent an elm satisfactorily in the herbarium a fully developed normal shoot, bearing a terminal shoot and one or more short shoots, is needed to show the mode of branching and other features. In addition, several detached short shoots should be included in the collection to represent adequately the typical foliage. This is the minimum. The other types of shoot mentioned can be added if desired, and of course flowers and fruits are necessary to complete the collection.

The genus *Ulmus* is one of several allotted to the writer for the preparation of descriptions for the new *British Flora*. The elms are not well represented in our national herbaria, and it is necessary to make collections of elms in all parts of the country to supplement the rather scanty material of this critical genus. The co-operation of members of the B.E.C. in collecting material on the lines indicated above would be a great help in bringing the work to a satisfactory conclusion. With each collection should be given the exact locality and notes on the habit of the tree, or, if possible, a photograph. A snapshot taken from a suitable viewpoint with a cheap camera is quite sufficient to show the habit. The type of soil and the geological formation are further points of interest.

In the case of unusual forms and hybrids, collections including a minimum of ten detached short shoots with all the leaves full-grown are especially desirable. These are needed to obtain the measurements necessary for determining the mean leaf shapes by the method described in *Annals of Botany*, N.S. I, No. 4 (1937), 673-80. For this purpose, the distal and subdistal leaves of the short shoots should be entire and pressed flat so that the outline of the leaves may be drawn accurately.

The writer will be glad to receive collections of either type, which should be addressed to him at the Royal Botanic Gardens, Kew.

CYPERUS LONGUS L. IN WILTSHIRE.

B. Gullick, B.Sc.

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This plant appears to have been recorded at one site only in the county of Wilts, where the possibility of its being native may be open to some doubt, and where it now seems to be extinct. This place is Boyton, near Codford, in South Wilts.

In *Wilts. A.M.*, *14*, 80 (September 1873), Dr T. B. Flower stated that it was " first discovered by the late A. B. Lambert, Esq., and Professor Don, in 1829, growing in great luxuriance and profusion, but of late years this elegant species has considerably decreased in quantity, through the rapacity of collectors." To this is appended, as a footnote, a brief biography of A. B. Lambert, Esq. He was born in 1761, and attached himself early in life to botanical pursuits and joined the Linnean Society at its foundation. On succeeding to his paternal estate (Boyton Manor) he was enabled to indulge his taste for botany more freely, and laboured with great ardour and success to increase his herbarium, which at length acquired the character of being one of the most valuable and important private collections in existence, and of which Professor Don acted as Curator for many years. It included the largest carpological collection perhaps ever made by a private botanist.

It is this last remark which raises suspicions. Mr Lambert in 1829 had reached the age of 68. In the *New Botanist's Guide* by H. C. Watson, Vol. I, 1835, page 46, is " *Cyperus longus*. I hear that it has been discovered growing abundantly near Mr Lambert's (Boyton) in Wilts. W. C. Trevelyan, MSS."; and in Vol. II, 1837, page 566, it is stated that " in 1829 Mr Peete found about a quarter of an acre of *Cyperus longus* within a quarter of a mile of Boyton House." It seems incredible that a man who, in early life, was interested in botanical pursuits could have overlooked such a rarity within a quarter of a mile of his own home, every year until he reached the age of 68. On the other hand, the carpological collection may have contained a surplus of certain seeds, and the place of deposit of unwanted matter at that date is not known.

In the *Flora of Wilts*, by T. A. Preston, 1888, 324, the entry includes " Rogers, *Exchange Club Report*, 1873, p. 26; still there 1884, Hussey." The note in the *Exchange Club Report* cannot be checked, so it seems that a wrong reference is given. It appears that this entry in the *Flora* is the last published record of the occurrence of this plant in Wilts.

About ten years ago an effort was made to ascertain if it was still growing at Boyton, and the following information was collected from Mrs Steward by the Hon. Mrs Campbell of Wilton. Some years ago a botanist (who is now believed to have been Mr T. H. Green, of Bath) called on the Rector of Boyton, then Canon Steward, for information

about the *Cyperus longus*, but it was not at that time known there, nor could it be found by the botanist. Subsequently, Canon Steward took a piece of meadow into the Rectory garden, and made a little pond, and in the following year a plant which Mrs Steward thought was the *Cyperus* came up spontaneously on the edge of the pond, but as they did not know the name of the botanist they could not inform him.

In 1928, the Rev. E. Graham, then Rector, said that he was told of the *Cyperus* in the pond before he came, but that he had never seen it, nor could it be ascertained that anyone else had seen it recently, so it was concluded that *Cyperus longus* was then extinct in Wilts. However, on 14th September, 1934, the writer made personal search and found the pond close to and nearly opposite the main entrance to Boyton Manor. At one end was a small clump of *Cyperus longus*, flowering, but short and the spikes very small and pale in comparison with specimens from elsewhere. It was growing with bamboos, reedmaces, etc. In that year it was seen by the Hon. Mrs Campbell and others. The adjoining meadows and stream sides were searched, but no *Cyperus* could be found, so it was considered possible that it might have been planted in the pond. This, however, does not appear to be the case.

Boyton Manor House is situated at the foot of the downs, close to the river Wylye. In the grounds is a small lake from which a stream drains through the water meadows before joining the river. There was no sign of *Cyperus* in the lake. In the immediate vicinity on the north are water meadows, not likely to have been disturbed by camps during the War, as were the fields around Codford.

In 1936 the Rev. P. H. B. Bridson, then Rector, related that the story as told him was that in Canon Steward's time, about 1920, an American botanist called and asked to see the *Cyperus*, saying that it was near the Church. They tramped around looking for it in vain, and at last Canon Steward suggested that they should give it up and have tea. They came through the lower Rectory garden and the botanist said, " Why, there it is, growing in the pond." Canon Steward had recently made the pond, and thought that it was a weed coming up. Mr Bridson could not ascertain that it had been known elsewhere in the village.

Unfortunately no *Cyperus* was seen flowering in the pond in 1935, nor in 1936, but the reedmaces had increased and had perhaps crowded it out. Thus it seems that *Cyperus longus* is again extinct in Wilts, yet there may still be dormant seeds which will germinate in due course.

There is a specimen in Dr Druce's Herbarium labelled Boyton, Wilts, without date or collector's name, but Dr Druce had added " Hb. Ansell, 1844." In the British Museum (Natural History) are two specimens from Boyton, one collected by F. I. White, 1838 (Soc. Bot. Edin.), and one from the Herbarium of Edward Forster, without date but received by the Museum in 1849. In the Herbarium at Kew are four sheets—one communicated by F. I. White—Coll., Sept. 1838; one in Herb. Borrer collected Oct. 1833, with label " in a small meadow where some

farm buildings stood, which were burnt down about thirty years ago"; one collected by W. A. Leighton, 1830; and one communicated by G. S. Henslow, no date (ex Herb. Ball).

There is no specimen in the Salisbury Museum Herbarium, but in that of the W.A.S. at Devizes is one labelled "Boyton Meadow, Oct. 1873." W. Moyle Rogers"; and another good sheet, "Boyton, W. Hussey," not dated, but probably 1884, cf. *Flora*. Doubtless many other Herbaria contain specimens, and it would be interesting to know whether any are dated after 1884.

THE CHAROPHYTA IN WALES.

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The earliest records for Charophyta in Wales appear to be those in the *Botanist's Guide* by Turner and Dillwyn, published in 1805, where *Nitella flexilis* is recorded under the name of *Chara flexilis* for the counties of Anglesey, Denbigh, and Glamorgan, and *Chara hispida* for the counties of Anglesey, Flint, and Glamorgan. Some of these early records for *Nitella flexilis* Ag. may refer to *Nitella opaca* Ag., whilst records for *Chara hispida* may be referable to one or other of the related species recognised at a later date. A specimen of *Nitella opaca* Ag., collected by Hugh Davies in Anglesey in 1795 and labelled "*Chara flexilis*," is in the British Museum Herbarium. Hugh Davies in his *Welsh Botanology* published in 1813 adds a third species for Anglesey, *Chara vulgaris* L., with a variety "Var. 2, Delicate Stonewort," probably *Chara fragilis* Desv. Few further additions were made until towards the end of the 19th century, when the late J. E. Griffith added several species from Anglesey. Since then numerous other botanists have from time to time added to our knowledge of the Welsh Charophyta.

Excluding probable errors fifteen species of Charophyta are recorded from Wales. The following table gives the number of species for each county. Doubtful or unconfirmed records are placed in brackets.

Monmouth 2 (1).	Radnor 2 (1).	Cardigan 3.	Caernarvon 6 (1).
Glamorgan 8 (1).	Carmarthen 5.	Montgomery 1.	Denbigh 2 (3).
Brecon 2 (1).	Pembroke 8 (1).	Merioneth 2 (1).	Flint 3 (1).
			Anglesey 14.

The occurrence of fourteen of the fifteen known Welsh Charophyta in Anglesey is doubtless due to the large number of lakes and pools, most of which are particularly suitable for the growth of these plants. Of the five rarer species, *Nitella tenuissima* (Desv.) Kuetz., *Chara rudis* (Br.) Leonh., and *C. aculeolata* Kuetz. are confined to Anglesey. *C. desmacantha* Gr. & B.-W. is found only in Anglesey and Pembrokeshire, and *Nitella hyalina* (DC.) Ag. is confined to Llyn Idwal in Caernarvonshire.

County records additional to those given in the *Comital Flora* are indicated by an asterisk.

Thanks are due to Messrs G. O. Allen, J. F. G. Chapple, A. A. Dallman, A. Wilson and N. Woodhead for records, and to the staff of the Botanical Department of the Natural History Museum, S. Kensington, for facilities to consult the National Herbarium.

872/2. NITELLA OPACA Ag.

Locally common in pools, lakes and streams.

Glamorgan: Clyne Common, W.R.L., *Journ. Bot.*, 1886, 377. Llandough near Cowbridge and Welsh St Donats, H.J.R., *Journ. Bot., Suppl.*, 1907, 73. Reynoldston, H.J.R., *Journ. Bot.*, 1909, 411. Neath, P.S.J., 1932, *Hb. N.M.W.*

Radnor: Presteigne, D., *B.E.C. 1923 Rep.*, 225 (1924).

Carmarthen: Llanelly, D.H., *B.E.C. 1912 Rep.*, 221 (1913).

Cardigan: Aberystwyth, W.H.L.

Montgomery: J.E.V., 1880, *Journ. Bot.*, 1884, 5.

Merioneth: Stream near the shore, Duffryn, G.R.B.-W., 1896, *Hb. Druce.*

Caernarvon: Llyn-an-afon, C.B., 1884, *Hb. N.M.W.* Llyn Idwal, J.E.G., 1884, J.E.L., 1931, *Hb. N.M.W.* Llyn Padarn, C.B., 1888, *Hb. N.M.W.* Cwm-y-glo, Lyn Glasfryn, and Nant Ffrancon, under Maes Caradog, J.E.G., *Fl. Angl. and Caern.*

Anglesey: Between Llyn Llwydiarth and Cors-y-Wiber, H.D., 1795, *Hb. Mus. Brit.* Llyn Frogwy, Llyn Dinam and Cors Bodeilio, J.E.G., *Fl. Angl. and Caern.*

The counties of Monmouth, Brecon, Pembroke and Denbigh are also given in the *Comital Flora*. I have been unable to trace the source of these records and suspect that they were inserted in error.

872/3. NITELLA FLEXILIS Ag.

Rare. Lakes and pools.

Glamorgan: (Crymlyn Bog, J.W., *Turner and Dillwyn, Bot. Guide*, I, 298). Mynydd-y-Glew, E.V., 1926, *Hb. N.M.W.* Kenfig Pool, E.V., 1927, *Hb. N.M.W.*

Carmarthen: Carmarthen, D.H., 1922, *Hb. Druce.* [Add to *C.F.*: see *B.E.C. 1923 Rep.*, 225 (1924), for previous record.—ED.]

**Caernarvon*: Llyn Gader and Llyn Glasfryn, J.E.G., *Fl. Angl. and Caern.*

Denbigh: (Llyn Aled, Llansannon, J.W.G., *Turner and Dillwyn, Bot. Guide*, I, 167. Mill stream, Aled Valley, near Llansannon, *Hb. Wood*).

Anglesey: (Ditches in Sybylltir demesne, H.D., *Welsh Bot.*). Bodgylched, J.E.G., 1885, *Hb. N.M.W.* Llyn Bodforth, J.E.G., *Journ. Bot.*, 1887, 146. Llyn Frogwy, J.E.G., *Fl. Angl. and Caern.*

Early records of *N. flexilis* are doubtful owing to confusion with *N. opaca*.

872/5. NITELLA TRANSLUCENS (Pers.) Ag.

Rare. Lakes and ponds.

**Pembroke*: Templeton, J.E.A., 1933, *Hb. N.M.W.*, 1934, *Hb. Mus. Brit.*

**Denbigh*: Chirk Castle Pond, N.W., 1936, *Hb. U.C. Bangor.* A poor, immature specimen, but apparently *Nitella translucens*.

Anglesey: Llyn Penrhyn, Llyn Treflas, and near Valley, J.E.G., *Fl. Angl. and Caern.*

872/8. NITELLA TENUISSIMA (Desv.) Kuetz.

Rare. Pools in peaty places.

Anglesey: Cors Bodeilio, 1882, near Lligwy, 1885, and Cors Ddraenog, 1885, J.E.G., *Hb. N.M.W.* Llanffinnan, C.B., 1884, *Hb. N.M.W.* Llyn-wyth-eidion, J.E.G., *Fl. Angl. and Caern.*

872/10. NITELLA HYALINA (DC.) Ag.

Very rare. Lakes.

**Caernarvon*: Llyn Idwal, N.D.S., 1913, det. G. O. Allen.

873/3. TOLYPELLA GLOMERATA (Desv.) Leonh.

Rare. Pools and lakes.

Glamorgan: Crymlyn Burrows, W.R.L., 1886, *Hb. Mus. Brit.*

**Carmarthen*: Laugharne, E.F.N., 1937.

Anglesey: Llyn Coron, *Hb. Borrer.* Near Penmon, R.W.P., 1892, *Hb. Mus. Brit.* Newborough Common, J.F.G.C., 1937, *Hb. N.M.W.*

Var. ERYTHROCARPA G. & B.-W.

Anglesey: Llyn Coron, J.E.G., 1893, *Hb. N.M.W.*

876/3. CHARA VULGARIS L.

Frequent. Pools, lakes and ditches.

Monmouth: Llanwern, S.H., *Fl. Mon.* Sandy Way, near Chepstow, 1892, Magor, 1894, and Roggiett, 1894, W.A.S., *Hb. N.M.W.* Near Rumney, A.E.W., 1922, *Hb. N.M.W.* Dixton Newton Parish, near Monmouth, W.W., 1891. *Hb. Mus. Brit.* Near Rossfield Farm and St Arvans, W.A.S., *Fl. Chepstow.*

Glamorgan: Crymlyn Burrows, W.R.L., *Journ. Bot.*, 1886, 377. Port Talbot and Porthcawl, H.J.R., *Journ. Bot. Suppl.*, 1907, 73. Sutton, H.J.R., *Journ. Bot.*, 1909, 411. Llandough, near Cardiff, 1920, and Roath Park, Cardiff, 1922, A.E.W., *Hb. N.M.W.* Cogan Marshes, E.V., *Glam. County Hist.*

Brecon: Llangorse Lake, A.E.W., 1925, *Hb. N.M.W.*

Carmarthen: Pembrey, D.H., *B.E.C. 1912 Rep.*, 221 (1913).

Pembroke: Tenby, J.E.A., 1928, *Hb. N.M.W.*

Cardigan: Borth, E.S., 1881, *Hb. N.M.W.*

Caernarvon: Near Llandudno, C.B., 1889, *Hb. N.M.W.*

Flint: In the "drowned" clay holes at Cefn-du brick works, near Rhyl, W.H., 1910. Tydn-y-gwynt, Rhyd-y-mwyn, C.W., 1916, *Hb. N.M.W.*

Anglesey: Llyn Coron, J.E.G., 1893, *Hb. N.M.W.*

The counties of Radnor, Merioneth and Denbigh are also given in the *Comital Flora*. I have no definite record for these counties: confirmation is therefore desired.

b. var. LONGIBRACTEATA Kuetz.

Monmouth: Itton, W.A.S., 1905, *Hb. N.M.W.*

Glamorgan: Porthcawl, H.J.R., *Journ. Bot. Suppl.*, 1907, 73.

Cardigan: Aberystwyth, E.S., 1881, *Hb. N.M.W.* Borth, E.S., 1881, *Hb. Druce.*

Flint: Pools on the marsh below Burton, A.A.D., *Journ. Bot.*, 1908, 227.

Anglesey: Llyn Coron and between Valley and Cleifiog Farm, J.E.G., *Fl. Angl. and Caern.*

c. var. PAPILLATA Wallr.

Glamorgan: Porthcawl, H.J.R., *Journ. Bot. Suppl.*, 1907, 73.

Anglesey: Between Pentraeth and Llangefni, C.B., 1884, *Hb. Mus. Brit.* Llyn Coron, G.C.D., *B.E.C. 1918 Rep.*, 412 (1919).

876/4. CHARA RUDIS (Br.) Leonh.

Rare. Pools.

Anglesey: Cors Bodeilio, J.E.G., 1882, *Hb. N.M.W.* Llyn-wyth-eidion, J.E.G., *Journ. Bot.*, 1895, 291. Pool by Llyn Maelog, I.M.R., 1925, *Hb. N.M.W.* Cors Goch, J.F.G.C., 1937, *Hb. Druce.*

876/5. CHARA HISPIDA L.

Rare. Pools.

Glamorgan: (Crymlyn Bog, J.W., *Turner and Dillwyn, Bot. Guide*, I, 298).

Pembroke: Bosherston Pools, H.A.H., 1925, *Hb. N.M.W.*, J.F.G.C., 1937. Stackpole, C., *B.E.C. 1930 Rep.*, 379 (1931).

**Flint*: About Rhyd Marsh, J.W.G., Turner and Dillwyn, *Bot. Guide*, I, 291. In the "drowned" clay holes at Cefn-du brick works near Rhyl, W.H., 1910.

Anglesey: (Near Llyn Maelog Hotel and Llyn Dinam, J.E.G., *Fl. Angl. and Caern.*). Newborough Common, J.F.G.C., 1937. Rhosneigr, H.G.

J. E. Griffith's records may refer to *C. rudis*, which has been collected in recent years near Llyn Maelog.

876/7. CHARA CONTRARIA Kuetz.

Rare. Pools and lakes.

Glamorgan: Oxwich, H. & J.G., and Kenfig Pool, H.J.R., *Journ. Bot. Suppl.*, 1907, 73.

Anglesey: Llyn Coron, J.E.G., 1881, *Hb. N.M.W.* Llyn Dinam, J.E.G., *Fl. Angl. and Caern.* Holyhead, J.E.G., 1884, *Hb. Mus. Brit.* Newborough Warren, T., 1932, *Hb. Druce.*

876/11. CHARA ACULEOLATA Kuetz.

Rare. Pools and streams.

**Pembroke*: Lillypool, Bosherston, J.F.G.C., 1937.

Anglesey: Cors Bodeilio, J.E.G., 1883, A.W., 1930, *Hb. N.M.W.* Llynwyth-eidion, 1885, J.E.G., *Hb. N.M.W.* Between Pentraeth and Llangefni, C.B., 1884, *Hb. Mus. Brit.* Newborough Common and Cors Goch, J.F.G.C., 1937.

876/12. CHARA ASPERA Willd.

Locally common. Pools and lakes.

Glamorgan: Oxwich, H.J.R., *Journ. Bot. Suppl.*, 1907, 73. Kenfig Pool, E.V., 1925, *Hb. N.M.W.* Cardiff, *Hb. Mus. Brit.*

Carmarthen: Gwendraeth Canal, J.M., 1846, *Hb. R.I.S.W.* [Add to *C.F.*: see *J.B.*, 71 (1907), for previous record.—ED.]

**Pembroke*: Pwll Trefeiddan, between St Davids and Rhosson, W.R.L., 1900, J.G., 1914, *Hb. Mus. Brit.*

Cardigan: Borth, E.S., 1881, *Hb. N.M.W.*

Caernarvon: J.G. & G.R.B.-W., *Brit. Charophyta*, II, 52.

Anglesey: Llyn Coron, 1881, Cors Bodeilio, 1882, Llyn Bod-gylched, 1885, J.E.G., *Hb. N.M.W.*

b. var. SUBINERMIS Kuetz.

Cardigan: Borth, E.S., 1881, *Hb. N.M.W.*

Anglesey: Llyn Hendref and Llyn Coron, J.E.G., *Fl. Angl. and Caern.*

c. var. LACUSTRIS H. & J. G.

Glamorgan: Kenfig Pool, E.V., *Glam. County Hist.*

d. var. CAPILLATA A. Br.

Anglesey: Llyn Coron and Llyn Hendref, J.E.G., *Fl. Angl. and Caern.* Near Holyhead, W.W., 1828, *Journ. Bot.*, 1880, 130.

876/13. CHARA DESMACANTHA Gr. & B.-W.

Rare. Pools.

Pembroke: Groves and Bullock-Webster, *Brit. Charophyta*, II, 55.

Anglesey: Cors Goch, J.F.G.C., 1937.

876/16. CHARA FRAGILIS Desv.

Locally frequent. Pools and slow-flowing streams.

**Monmouth*: Trefil, A.E.W., 1924, *Hb. N.M.W.*

Glamorgan: Pilton Green, Crymlyn Burrows, Port Talbot, Porthcawl and Roath, H.J.R., *Journ. Bot. Suppl.*, 1907, 73. Oxwich, E.V., *Glam. County Hist.*

**Pembroke*: Head of Penally Bog, H.T., 1867, *Hb. Mus. Brit.* Pool on Newgale sands, H.N.R., 1882, *Hb. Mus. Brit.*

Caernarvon: Llandudno and Great Ormes Head, J.E.G., *Fl. Angl. and Caern.* Near Porth Neigwl, J.L.W., *Fl. Angl. and Caern.*

Anglesey: Cors Bodeilio, J.E.G., 1883, *Hb. Mus. Brit.* Afon Maelog, J.E.G., *Fl. Angl. and Caern.*

Hugh Davies's record for *Chara vulgaris* var. 2 from Trewilmot is probably referable to *C. fragilis*.

b. var. HEDWIGII (Bruz.) Kuetz.

Anglesey: Afon Llangefni, J.E.G., 1889, *Hb. N.M.W.* In the *Flora of Anglesey and Caernarvon* as var. *fulcrata* Gant.

876/17. CHARA DELICATULA Ag.

Locally common. Lakes, pools and ponds.

Glamorgan: Welsh St Donats and Merthyr Tydfil, H.J.R., *Journ. Bot. Suppl.*, 1907, 73. Mynydd-y-Glew, A.E.W., 1921, *Hb. N.M.W.* Riddelsdell's record for Welsh St Donats presumably refers to the Mynydd-y-Glew locality.

**Brecon*: Pool at the base of the Brecon Beacons, J.F., *Journ. Bot.*, 1886, 22.

Pembroke: Crumwere, R.T., *B.E.C. 1924 Rep.*, 605 (1925). Lillypool, Bosherston, J.F.G.C., 1937.

Merioneth: Near Dolgelly, J.G., *Journ. Bot.*, 1881, 353. As "*C. fragilis* approaching var. *barbata*."

**Denbigh*: Small pond below "Whalley's Folly" between Trevor and Llangollen, "approaching the var. *barbata*" H. & J.G., W.W., *Journ. Bot.*, 1890, 189.

Anglesey: Cors Bodeilio, 1882, Llyn-wyth-eidion, and Llyn Coron, 1893, J.E.G., *Hb. N.M.W.* Cors Hendref, J.E.G., *Fl. Angl. and Caern.*

b. var. BARBATA (Gant.) Gr. & B.-W.

Radnor: Radnor, A.L., 1881, *Journ. Bot.*, 1883, 20.

Pembroke: Groves and Bullock-Webster, *Brit. Charophyta*, II, 68.

**Flint*: Cwm, J.A.W., 1901, *Hb. N.M.W.*

Anglesey: Cors Bodeilio, J.E.G., 1882, *Hb. N.M.W.*, J.F.G.C., 1937. Llyn Coron, J.E.G., *Fl. Angl. and Caern.*

(*Chara fragilis* and *Chara delicatula* were inadvertently omitted from the *Comital Flora*, but the records above marked with an asterisk are additional to the list of records prepared by Dr Druce for publication.)

The following doubtful records have been omitted:—

NITELLA GRACILIS (Sm.) Ag. "Llyn Idwal, W. Wilson," Hooker, *English Flora*, V, p. 246, 1833. This was probably *Nitella hyalina* (DC.) Ag. found there by N. D. Simpson in 1912.

CHARA TOMENTOSA L. "On a bog nearly opposite the house of Alyn Bank, near Mold, Flintshire, Mr Griffiths." Withering *Arrangement of British Plants*, ed. 7, II, p. 2, 1830.

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Griffith, J. E. *The Flora of Anglesey and Caernarvonshire.* Bangor. n.d. [1895].

Groves, J., and Bullock-Webster, G. R. *The British Charophyta.* London, 1920-1924.

Hamilton, S. *The Flora of Monmouthshire.* Newport, 1909.

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Journal of Botany. 1880-81, 1883-84, 1886-87, 1890, 1907-09.

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Riddelsdell, H. J. "A Flora of Glamorganshire," *Journal of Botany,* xlv. Supplement, 1907.

Shoolbred, W. A. *The Flora of Chepstow.* London, 1920.

Turner, D., and Dillwyn, L. W. *The Botanist's Guide.* London, 1805.

Withering, W. *An Arrangement of British Plants,* ed. 7, II. London, 1830.

REFERENCES: HERBARIA.

Hb. Druce. The Herbarium of the late G. C. Druce, Oxford.

Hb. Mus. Brit. The Herbarium of the British Museum (Nat. Hist.), South Kensington.

Hb. N.M.W. Welsh National Herbarium, National Museum of Wales, Cardiff.

Hb. R.I.S.W. The Herbarium of the Royal Institution of South Wales, Swansea.

Hb. U.C. Bangor. The Herbarium of the University College, Bangor.

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W.W.=W. Whitwell.
W.Wi.=W. Wilson.

REVIEWS.

CLARKE, W. G. In Breckland Wilds. Second Edition revised and rewritten by R. Rainbird Clarke, B.A. Pp. vi + 200 with 19 photographic illustrations and pictorial map. Cambridge: W. Heffer & Sons, Ltd., 1937; 12/6 net.

The richness of the flora of the Breckland district of the Norfolk-Suffolk border has long been familiar to British botanists, and no apology is needed for bringing a general topographical work including archaeology as well as all branches of Natural History of the district to their notice. The chapter on the flora contains an outline of the ecology and plants of the district and is more accurate than is usual in such works. The author wisely finds it unnecessary to postulate any ancient association with marine conditions to explain the presence of plants characteristic of the coast, and he rightly stresses the great importance of the calcium carbonate content in the soil as influencing local variations in the richness of the flora. The remainder of the work dealing with the geology and ornithology, the past history of Breckland cultivation, modern afforestation, and the navigation of the rivers contains much material of importance for a proper understanding of the flora of the area. The appendices include a very full Bibliography and a list of "Special Breck Plants." *In Breckland Wilds* should be in the library of every naturalist interested in this fascinating area.

J. E. LOUSLEY.

DRABBLE, HILDA. Plant Ecology. Pp. 142 with 12 plates (24 photographs). London: Edward Arnold & Co., 1937; 7/6 net.

In recent years great strides have been made in the scientific study of plants in their natural homes so that, while a brief chapter in a general botanical text book was sufficient thirty years ago, something better is now both welcome and necessary. The author of this little book has summarised in a very readable form much of the work of the past thirty years.

The first part, which is devoted to a general summary of physical and biological factors which react on a plant, occupies a third of the book.

The other part is devoted to a description of various plant communities, and excellent summaries though some of these are, one cannot help feeling that there is often a general lack of contact between the author and the localities described. This is very noticeable in the chapters on Mountains, Fen, and Marshes There is, for example, a strange mix-up of the mountain plant communities of Wales, Yorkshire, and Scotland that should have been kept quite separate. The account of the formation of fen, salt marsh, and estuary are hardly accurate. The mud which is deposited in an estuary does not come from the river bed but from the surrounding land. There is also no mention of plants in running water and one would have thought that

the inaccurate statement that water plants absorb dissolved salts through stems and leaves would not have found a place in an up-to-date book. The group of rootless plants which float near the surface because the water is too deep for them to be rooted, scarcely fits in with the known distribution of duck-weed and frog-bit.

The most unsatisfactory part of the book, however, is the marked inconsistency in citing the names of the plants. Sometimes only common names are used—they may even be wrong ones, as winter-cress for *Pyrola*—sometimes the latin name or merely the generic name and sometimes both English and Latin appear. *Vaccinium Myrtillus* is called Blaeberry in one chapter and Bilberry in another. This is a great pity as it is difficult enough to persuade the beginner to appreciate the value of the scientific binomial and this kind of citation does not help.

Although errors must creep into the most carefully prepared book, this one has too many to be overlooked. The worst is *Salicornia* for *Suaeda*, but many others occur and the small list of errata at the front could well be expanded to a page. There is no doubt, however, that with all its defects this book will stimulate field observation and for that alone it is very welcome.

R. W. Butcher.

Holmes, E. J., and Gibbs, R. D. A Modern Biology. Pp. 272 with 163 figs. Cambridge: at the University Press, 1937; 3/6 net.

There has been, within recent years, an increasing tendency in teaching to emphasize the resemblance between the interactions of plants and animals rather than to teach botany and zoology as separate and unrelated subjects. Further, much of the older, often rather scrappy and unsatisfactory, presentation of biological data and problems under the title of "Nature Study" is being replaced by basically sounder methods dignified by the term "biology." In many ways these changes are signs of desirable progress, but there are certain dangers to be avoided and disadvantages which may become apparent if the change involves throwing over what was desirable in the older methods. One danger is that zoologists may demand and obtain the lion's share of the subject, which would then become zoology with a small botanical appendix. Again, some of the old Nature Study did encourage real acquaintance with plants and animals as organisms of man's environment. Much modern biological teaching becomes limited to the reading of text-books and laboratory work. That students (even children) should learn to use books and should be submitted to the exact discipline of the laboratory is granted; that training should be limited or almost limited to pre-arranged experiments and to what others have abstracted is quite unsound.

The new direction in teaching, largely guided by syllabuses and examination papers, has resulted in the appearance of new text-books for teachers and students. The one noticed here has many valuable features. Its format is agreeable, it is well illustrated, it keeps a fair

balance between plants and animals, and shows the close relationship of biology to human affairs. One would have liked more diagrams in perspective. Students in a laboratory rarely have binocular microscopes available for their use and often their microscopic work is limited to the drawing of sections or of objects viewed as two-dimensional. Such a diagram as that, on p. 26, of half a *Spirogyra* cell is far more suggestive than that on the opposite page showing stages of conjugation. Within its limits of subjects the book usefully amalgamates structure and function, both for animals and plants. At the end of each chapter are numerous suggestions for practical work. Most of these suggestions are excellent. It is, however, probable that the student would need much more help and guidance than is given in the text to carry out a reasonable number of the experiments satisfactorily without spending far more time than is allowed in school time-tables.

A few of the comparisons made between plants and animals may lead to erroneous conclusions unless certain fundamental differences are explained by the teacher. This applies especially to such comparisons as that of the " skeletons " and of water balance in animals and plants.

The authors state that their chief difficulty has been in knowing what material to include and what to exclude. On this subject both teachers and reviewers are likely to hold a wide range of opinions. Very little is said about germination, and relatively little about flower, fruit, and seed structure. These are matters not only of great biological interest in themselves but also fundamental to a proper understanding of the problems of evolution and heredity. The most serious gap appears to be the absence of even references to ecology and classification. Certainly neither is given in the index. Properly introduced to students, either of these divisions of biology can be used as a nucleus around which most of the rest of biology can be built.

These criticisms indicate the limits, and rather serious limits, of this text-book. As a laboratory or class-room manual, when supplemented by able teaching, it should prove extremely valuable, so long as real field studies are also undertaken.

W. B. TURRILL.

JAMES, W. O., and CLAPHAM, A. R. The Biology of Flowers. Pp. vi + 116 with 70 figs. Oxford: Clarendon Press, 1935; 8/6.

In this book flowers are described in relation to their main function, that of providing a mechanism for the production of the seeds by which flowering plants reproduce themselves.

The first five chapters deal with flowers in general; their association in the inflorescence: their parts, including the structure of stamens, the development of pollen and ovules, also the developmental relations of the parts in relation to the ultimate form of the flower: pollination—the general relations between the method of pollination and the flower as regards structure, colour, nectaries, self- and cross-fertilization: fruits—their types and dispersal.

Next follows a short chapter dealing with the best methods of examining, dissecting and drawing flowers, introducing the main body of the work, in which 31 flowers are described in detail, with large clear drawings and floral diagrams. No systematic classification is attempted, but a sufficiently wide range of types is selected to illustrate the great variety of structure, pollination mechanism and general biological relations through which the function of seed production is fulfilled. A tabular summary, glossary of terms, and short bibliography complete the book.

With the possible exception of the oak catkin the drawings are excellent, and anyone who, after personally examining some of the types here dealt with, uses the same methods for the study of other flowers, will have a good guide to a fascinating and unlimited field. The production is of the excellence associated with the Clarendon Press.

A. J. WILMOTT.

WILSON, ALBERT, F.L.S., F.R.Met.Soc. The Flora of Westmorland. Pp. viii + 413, with 38 photographic plates and 1 map. Arbroath: T. Buncle & Co. Ltd., 1938; 25/- (to be obtained from the author: A. Wilson, Tir-y-Coed, Ro Wen, Conway).

It is rather remarkable, in view of the attractive nature of the country and the richness of its vegetation, that no complete work on the Westmorland Flora should previously have appeared. J. G. Baker's *Flora of the Lake District*, published over 50 years ago, included the western portion of the county but the greater part lay beyond the boundaries of that work. This gap in the series of county Floras has now been admirably filled by Mr Wilson, whose work not only brings together all the records for flowering plants and vascular cryptogams but also deals equally fully with the hepatics, mosses and lichens.

Few counties are as fortunate as Westmorland in suffering so little destruction to their floras through industry and town expansion. The greater part of the county consists of pasture and moorland and presents a great diversity of surface both as to elevation and geological nature. The western fells of the Lake District are composed of hard slates, grits and flags of Ordovician and Silurian age, whilst the Pennine hills are made up of Carboniferous grits and limestones. Considerable areas of limestone pavement and scars in the south and east central part of the county still carry more or less aboriginal scrub and woodland. Only in its maritime associations is the vegetation necessarily limited, the coastal area consisting of a very restricted belt of muddy salt marsh and shingle about the Kent estuary.

In the introductory chapters a descriptive account is given of the topography and botany of the six river basins into which the county is divided for recording purposes. A sketch of the climate reveals very wide variations in rainfall from 30 in. at Temple Sowerby to 130 in. in the Langdale valley. Although purely an agricultural county the deleterious effects of smoke from Lancashire and the West Riding

on bryophytes and, more particularly, lichens, is noticeable in the southern part of the county. A further section is devoted to an analysis of the flora and comparison with those of neighbouring counties. Here the richness of the Westmorland flora is well shown. The total number of vascular plants recorded (excluding aliens, casuals and adventives) is 959, whilst the North Riding, with an area nearly three times as large, has 1005 species. The exclusion of species belonging to the class of colonists reduces the difference to no more than half a dozen. It is somewhat surprising to find that, though Germanic and Atlantic types are very weakly represented (as would be expected), yet the former outnumber the latter by 30%. (This relationship does not hold for the bryophytes.) The numerous peaks ranging from 2000-3000 ft. bring in a considerable number of alpine and sub-alpine species, which include such rarities as *Cerastium alpinum*, *Potentilla Sibbaldii*, *Saxifraga nivalis*, *Epilobium alpinum*, *Saussurea alpina*, *Myosotis alpestris*, *Bartsia alpina*, *Salix Lapponum*, *Luzula spicata*, *Carex atrata* and *Poa alpina*. Other notable species which occur in the county include *Ranunculus reptans*, *Subularia*, *Helianthemum canum*, *Linum anglicum*, *Potentilla fruticosa*, *Saxifraga Hirculus*, *Meum*, *Senecio integrifolius*, *Vaccinium uliginosum*, *Gentiana verna*, *Veronica hybrida*, *Ajuga pyramidalis* (which the present writer has twice diligently sought for on Ill Bell without success), *Allium Schoenoprasum*, *Juncus filiformis*, *Carex magellanica*, *C. ornithopoda*, *Adiantum*, *Asplenium germanicum* and *septentrionale*, *Cystopteris montana*, *Lastraea rigida* and *Woodsia ilvensis*.

The usual data as to distribution, grade of citizenship and altitudinal ranges are given but first records are not given consistently for all species. These data are omitted for many common species and for comparatively recent additions to the county list. Species occurring in North Lancashire but not recorded in Westmorland are included as bracketed entries; a useful feature, as thereby the Flora includes all the species occurring in vice-county 69. As regards the treatment of the "critical" genera, it is evident that some of these have received comparatively little attention. Especially is this the case for the Pansies and Roses, the Rose records occupying no more space than those for the Ladies Mantles. *Rubus* and *Hieracium* have received more attention with 37 and 50 species respectively. The Marsh Orchid records should have been overhauled in view of recent changes in nomenclature. All the *O. incarnata* stations refer to *O. latifolia* and surely *O. praetermissa* is not "locally plentiful" and *O. purpurella* "rare." Many of the records under *O. praetermissa* are stated to be for the variety *pulchella* Druce, but that variety has been abandoned as being little more than *O. purpurella* with unspotted leaves. One feels doubtful if the remaining records for Druce's species are trustworthy.

The nomenclature follows in the main that of the *London Catalogue* and has therefore all the imperfections of that work. *Erythraea* is used for *Centaurium*, *Cnicus* for *Cirsium* and specific names are never attributed to more than one author. It is not clear why, in a few in-

stances, such as *Umbilicus pendulinus* and *Hammarbya paludosa*, the *London Catalogue* has been departed from in the interests of correctness when many other errors of citation are retained.

These are, however, but minor criticisms of a work the value and charm of which far outweigh its defects. The book is enriched by 37 photographs of typical scenery and plants. These are nearly all the work of the author's son and their uniform excellence adds greatly to the pleasure experienced in turning over the pages of the Flora. Where all are so good it is difficult to select examples for special mention, but the illustrations of *Bartsia alpina* at Orton and *Myosotis alpestris* on Little Fell could not possibly have been bettered; and the views of the old bridge at Kirkby Lonsdale, High Cup Gill, Cauldron Snout, the Langdale Pikes and Dove Crag are but a few of the beautiful scenic illustrations. There is in addition a portrait of the author at work in his study. This we should have liked to see as a frontispiece but with an excess of modesty it is relegated to the region of the index and omitted from the list of illustrations.

The format and printing of the Flora are alike excellent and the book is provided with a separate folding coloured map of the county. We hope that this work will have the ready sale which it deserves and we congratulate the author upon the completion of a volume which is a valuable addition to the works on regional botany.

W. A. SLEDGE.

WOLLEY-DOD, Lieut.-Colonel A. H. (Editor). Flora of Sussex. Pp. lxxiii + 571 with 6 photographic plates and 2 maps. Hastings: Kenneth Saville, 1937; 15/-.

At the close of the year 1937 the *Flora of Sussex* was published and sent out to subscribers after ten years of preparation.

Sussex is a county of great natural beauty with a seaboard of nearly ninety miles facing the English Channel. This shore of shingle beach, mud-flat, chalk-cliff and sand-dune, together with a great diversity of geological formations inland, provides the substratum for a rich and varied flora. The high ground of Ashdown Forest even shelters a few plants usually associated with sub-alpine regions. This is especially so in regard to mosses and liverworts. Hitherto, among the county Floras of England, Sussex has been represented by a modest little volume by the late Rev. F. H. Arnold of Westbourne. This was published in 1887, a second edition following twenty years later, but this work could not be compared with the Floras of Hampshire, Kent, and the more recent *Flora of Surrey*. It was scarcely more than a catalogue of localities, and even so many known to Arnold were not included, as has been found by the Editor and others working on the new Flora. Critical notes on the plants, their variations, partiality for various soils and habitats, etc., were not included.

Thus it was that many botanists interested in the Sussex flora, some residents in the county or its neighbours, felt that such a county as

Sussex should have a county Flora equal to those of the surrounding counties. Moreover, as many leading British field botanists had done much work in the county, particularly the Rev. E. S. Marshall and C. E. Salmon, there was a wealth of additional knowledge awaiting collation.

In 1927 the South Eastern Union of Scientific Societies held their Annual Congress at Hastings and in his Presidential Address the late Dr A. B. Rendle suggested that the local Natural History Societies might work towards the preparation of a new Flora. The Botanical Section of the Union took the matter up forthwith and local Societies and botanists interested in Sussex plants were circularized and invited to help. In 1930, after much preliminary work had been done by Mr F. O. Whitaker, the Hon. Secretary of the Botanical Section, the Committee invited Lt.-Col. A. H. Wolley-Dod, who is resident in East Sussex, to undertake the editing of the Flora. This he has done with the co-operation and assistance of many authorities on critical genera, nomenclature and general problems. Publication was held up for nearly two years for financial reasons but these were overcome. The delay so occasioned enabled much additional work bearing on the plants of Sussex to be incorporated, though a few items have been overlooked.

The Flora runs to 571 pages in addition to an introduction of 73 pages which is not wholly the Editor's. As in many other county Floras the mosses, liverworts, lichens, fungi, etc., are not included, though it is intimated that an account of these may appear later. The topographical notes for the county generally and the botanical divisions make excellent and instructive reading. One is glad to see that the Rev. A. A. Evans has collaborated with the Editor in this subject. The list of hills over 700 ft. might have included the hill above Newbridge and Hartfield which is well over 700 ft. by King's Standing and separated from Crowborough Beacon by a deep valley.

A thorough account of the geology follows by Henry B. Milner, M.A., D.I.C., F.G.S., but after this one is very disappointed in the geological sketch-map inserted at page xxiv. Doubtless a coloured map would have been expensive but the Flora merits more than this black and white outline. It is far from easy to read and understand even by one familiar with the subject. The map (fitted in a strong cover) showing Botanical divisions which are based on river drainage as in Arnold's Flora, is also unsatisfactory. Botanists recording plants found near the boundary of a division would be better advised to rely on the 1 inch =1 mile ordnance maps in conjunction with the descriptions of the boundaries given in the introduction. This is no easy task as they do not always follow a watershed.

The chief feature of Sussex scenery is the chalk range of the South Downs, which, extending as it does from the Hampshire border to Eastbourne, crosses five of the seven botanical divisions, those of the East Rother and Medway being without a natural chalk flora. In England this flora may be said to be at its fullest in Sussex, several

plants such as *Asperula cynanchica* L., *Senecio integrifolius* (L.) Clairv. and *Phyteuma orbiculare* L. being more frequent in Sussex than in any other English county. Notable absentees from Sussex are *Anemone Pulsatilla* L. and *Astragalus danicus* Retz., but these are absent from the bordering counties also. Owing to the expansion of the towns on the coast and their tendency to join one with another we are losing many stations for interesting plants, just as Surrey and Kent are suffering from the growth of London's suburbs. The records of some of the ferns and clubmosses have in recent years become very few and intermittent in Surrey, Kent, and to a less extent in Sussex. This may be partly due to natural causes, as many northern species are dying out in southern counties.

Nearly 14 pages of "Sussex Botanologia" supply details of the work done in Sussex from the time of the Herbals down to the present day. Surely "Sir" Joseph Woods (p. xli) is an error? The number of species admitted in the Flora is 1413, but in the summary given in the comparison of the flora with adjoining counties 1412 is the number quoted. This number is not strictly accurate for it is noticed that several Salices and two Potamogeton hybrids, besides such plants as *Carex axillaris* Good. and *Polypogon lutosus* (Poiret) Hitchcock are listed as species. This upsets the balance as these plants are correctly dealt with in other floras. This summary, a feature sadly lacking in the *Flora of Surrey*, demonstrates that the surrounding counties compare very favourably with Sussex in the number of species credited to each, even when allowance is made for Surrey lacking a sea shore and thus a maritime flora. Just a few coastal species occur very sparingly on the tidal bank of the Thames in Surrey.

Two and a half pages are occupied with details of plants of special interest in the flora of Sussex. Several statements here, however, call for comment. *Ulex Gallii* Planch. is definitely known as a Surrey plant in the Hindhead district. I should not like to say that *Lathyrus maritimus* L. was ever common on the Sussex coast. *Ludwigia palustris* (L.) Ell. certainly still grows in south-west Hampshire in more than one station. Some field botanists consider that *Eryngium campestre* L. is nowhere native in Britain, while the evidence for accepting *Cirsium eriophorum* (L.) Scop. as a Sussex plant appears to be very flimsy. It is in England quite rare on chalk, usually being found on oolite and other forms of limestone. Possibly *Carduus nutans* L. or *Onopordon Acanthium* L. was really seen, or even *Silybum Marianum* Gaertn., which incidentally is stated to be native contrary to general views. It is very doubtful if *Scrophularia alata* Gilib. occurs to-day in Surrey: it is strangely rare in south-eastern England. There is an ancient record for *Orchis Simia* Lam. based on a drawing by Francis Bauer in the British Museum, but it surely never grew at Petworth which is on a sand ridge, but on the downs to the south. Sussex seems to be losing such plants as *Damasonium Alisma* Mill. and *Pulicaria vulgaris* Gaertn., the neighbouring counties sharing the misfortune. *Carex dioica* L. is

not yet extinct in Surrey or Hampshire. The *Flora of Surrey* does not say so and it was near Bisley a few years ago. Druce's record for this sedge in Rayner's Supplement to Townsend's *Flora of Hampshire* has apparently been missed, while I saw it abundantly near Liphook in 1937.

A useful feature is the list of casual aliens that have been recorded in Sussex. A considerable number of aliens which are entitled to be classed as colonists or established aliens are included amongst the numbered native species in the body of the flora. The status of many of these is not an easy task to assess but there are cases in the flora with which many field botanists familiar with the flora of south-eastern England would take exception. *Berberis vulgaris* L. is said to be sometimes native while *Chelidonium majus* L. is wholly accepted as such. The species of *Papaver* are all described as colonists while those of *Fumaria* are all classed as native. If *Diplotaxis tenuifolia* (L.) DC. be accepted as native why not *D. muralis* (L.) DC. and its variety, *caulescens* Kittel, which is certainly indigenous? Surely *Trifolium resupinatum* L. (numbered) and *T. agrarium* L. (unnumbered) are of equal status. *Inula Helenium* L. is rather surprisingly given native status although *Campanula latifolia* L. is dismissed as an alien. The latter's occurrence as a native in southern England should be investigated as many of the records for it are old. The treatment of *Asparagus* seems confused as surely *A. maritimus* Mill. (the Cornish plant) does not occur in Hampshire or eastwards. *Ornithogalum pyrenaicum* L., though long known at Fishbourne (200 years) deserves a ? before "native" in view of the nature of the locality. It is generally considered that *Bromus interruptus* Druce is rather spasmodic in its appearance, at least it is so in Surrey, so it is to be doubted if it is any more permanent in Sussex. *Elymus arenarius* L. at West Wittering may have come from Hayling Island where it is native rather than westwards round Selsey Bill from Pagham.

The Plan of the Flora gives an explanation of how the species are dealt with and of the arrangement of localities, the procedure being no different from other county floras. Here and there a single station for a plant has been credited to each of two adjacent divisions, chiefly because recorders are not always explicit in describing localities. The Editor might have weeded out some of this duplication but it is a difficult task, especially so in the region about the mouth of the River Arun. There are no new species, varieties or forms described in the Flora, but many species are now first recorded for one or other of the two botanical vice-counties into which Sussex is divided. The new Flora will be an aid in correcting and bringing up-to-date " Topographical Botany " and Druce's " Comital Flora."

Many readers will turn to the various critical genera to see how they have been treated. The Editor has had, and acknowledges, expert help with many of them from our leading specialists but inevitably there are a few points one can comment on. In *Viola* I have had my notice drawn to the placing of *subcarnea* Parl. as a form and *dumetorum* R. & F. as

a variety of *V. odorata* L. though both are colour forms of equal significance. *V. calcarea* Greg. is maintained as a separate species though said to be now regarded as doubtfully distinct from *R.* (*sic*) *Foudrasi* Jord. Here occurs one of the few typographical errors found in the Flora. *Sagina Reuteri* Lange is surely very doubtful as a Sussex plant. The *Rubus* list appears to contain many records, some of which are errors, or unconfirmed identifications—just, one might say, a collection of records, right and wrong. The *Hieracium* list does not seem to be so long as one would expect, due no doubt to the reasons expressed in the paragraph preceding the account of the genus. The interesting notes on *Gentiana baltica* and *G. campestris* should have been followed by the adoption of the name *G. anglica* Pugsl. for *G. lingulata* Ag., var. *praecox* Towns. The account of *Mentha* would appear to show Sussex as a county rich in mints, but it has been the experience of several friends and myself that mints are much scarcer generally in Sussex than in Surrey or Hampshire.

Sussex has always been known as a county where the Orchidaceae are well represented. It is to be hoped that the plants will be left alone in their habitats now that information about some of them becomes common knowledge. One does not want the Flora to stimulate interest in orchids and other showy but scarce plants to the extent of an orgy of " collecting " which generally serves no other purpose than to exterminate the plants, when indulged in by uninformed people. The Hampshire record of *Cephalanthera rubra* L. was an error and maybe the Kentish one was too. Surely *C. longifolia* (Huds.) Fritsch never occurred in such a station as Chiltington Bog, quite unsuitable an habitat for this lover of beech woods. *Epipactis leptochila* Godfery has been recorded by P. M. Hall from both north and south Hampshire. *Orchis O'Kellyi* Druce is made a variety of *O. elodes* Gris. incorrectly and evidently inadvertently as there is no mention of " comb. nov." On page 430 *O. incarnata* L. is retained without any reference to Pugsley's interpretation of *O. latifolia* L., although reference is made to *O. pardalina* Pugsl. Also under *O. incarnata* L. appears the hybrid *latifolia* × *praetermissa* showing that it was intended to change *O. incarnata* L. to *O. latifolia* L. but overlooked. This will confuse some people not *au fait* with recent research in this genus. Mr Lousley tells me that *Gymnadenia albida* (L.) Rich. was not *seen* in 1932 in St Leonard's Forest, but that was when the record was sent in. It is a pleasure to see a full account of the Carices, so poorly dealt with in the *Flora of Surrey*. In comparison with its occurrence in Surrey *C. pulicaris* L. seems to be frequent in Sussex. I wonder how many of its stations (none listed!) would produce it to-day? Many stations are given for *C. Leersii* F. Schultz placed as a variety of *C. contigua* Hoppe, which makes one wonder why it is so rarely seen in Surrey. The references to *C. tomentosa* L. should stimulate search for it; the Arun or Adur valleys are likely. It is a pleasure to see that many records made by C. E. Salmon are a feature of the *Carex* list.

At the end of the Flora where they are apt to be overlooked there are six excellent photographs of characteristic Sussex plants, but nowhere in the book can I find mention that they are by E. J. Bedford of Lewes, well known for his flower portraiture.

There are but few misprints in the Flora, mostly recorders' initials wrongly given, e.g., E.W. for E.W.S., E.C.M. for E.C.W., etc. One or two place names suffer, such as Nepp for Knepp. Under *Rumex maritimus* L. Patching Pond is placed correctly in division II, but in division I under the next species. *Sparganium neglectum* Beeby (p. 454) is said to be recorded from all divisions save I, but a list of localities in that division immediately follows. On page 496 *Leersia* is said to be known in North Hants, but this should read South Hants. What is the *west* coast of Kent mentioned on page 516?

The book is well and clearly printed and bound in a strong but plain cover, which opens flat to one's satisfaction. If attention has been drawn above to a number of errors, these are but minor blemishes and merely serve to emphasize the general high standard of the Flora. Much praise and gratitude are due to the Editor for the time and energy he has expended upon the Flora from all those who love Sussex by the sea. The Flora can proudly take its rightful place on our bookshelves in company with those of the counties that march with Sussex.

E. C. WALLACE.

ABSTRACTS FROM LITERATURE.

Compiled by the Hon. Editor with the collaboration of the following helpers:—Miss M. S. Campbell, R. A. Blakelock, Dr E. G. S. Brown, A. A. Bullock, J. S. L. Gilmour, A. K. Jackson, Dr R. Melville, and A. J. Wilmott.

GENERAL.

(A) MORPHOLOGY.

THE ANGIOSPERMOUS FLOWER.—Appl (1937) gives the Ranunculaceae an Ophioglossales ancestry, the flower arising by shortening of the flower axis similar to the origin of the Euphorbiaceous flower by shortening and reduction of the Gnetum flower. Rosales are considered of independent fern origin, and Myrtales of Bennettitinean origin. The Helobiae are considered to have no phylogenetic connection with the Ranunculaceae.

Schaffner (1937) treats the angiospermous flower as being strictly the same system as the strobilus of horsetails, clubmosses, cycads and conifers. The evolution of unisexual flowers is regarded merely as an expression of sex-determination in space and time in the development of the shoot. Nine fundamental morphological flower types are postulated, and these are diagrammatically illustrated from actual plants.

EMBRYO SACS.—Several British genera are mentioned in a study by Maheshwari (1937) of the various types of angiosperm embryo sacs, which are classified (good diagrams).

CAUSES OF MONSTROUS FLOWERS.—Floral abnormalities caused by the attack of mites of the genus *Eriophyes* on *Geranium sanguineum* L., *Cardamine hirsuta* L. and *Polygala serpyllacea* Weihe are described in detail by Moyse (1937).

(B) ANATOMY.

WATER-SUPPLY OF THE PLANT.—A few British species are mentioned by Salisbury (1937) in his discussion of the water-supply of a plant.

(C) CYTOLOGY.

It is shown by Sax and Sax (1937) that stomata frequency can be used as an index of polyploidy, the number per unit area being reduced in a tetraploid as compared with a diploid, by a fraction of the order of 50%. The evidence adduced is not claimed as conclusive.

(D) BIOLOGY.

PARASITISM.—While preparing sections to show penetration of the haustoria of Dodder (*Cuscuta trifolii* Bab.) into the stem of clover, Ellis (1937) observed that, where stems of the Dodder overlapped, the haustoria commonly penetrated the stem of the Dodder itself without passing into the stem of the clover. A similar phenomenon has been observed in *Lathraea Squamaria* L.

PSEUDOCOPULATION IN THE ORCHIDACEAE.—The term " pseudocopulation " is used by Ames (1937) to describe the method of pollination which has been observed in some species of Orchids to the flowers of which the males of certain species of insects are sexually attracted. This paper gives a useful résumé of the well-known observations of Pouyanne and Godfery on *Ophrys* and those of Mrs Edith Coleman on the Australian genus *Cryptostylis*. The author, basing his argument upon the supposition that *Ophrys* and *Cryptostylis* are very primitive genera, develops the theory that pseudocopulation is also a primitive character. Apart from other considerations his argument would appear to be entirely vitiated by the wording of the following sentence (the italics are mine—P.M.H.):—" Allowing for differences of opinion, and in this case they are *delightfully negligible*, the positions assigned to Ophrys and Cryptostylis indicate that pseudocopulation, *no matter what future studies and discoveries may reveal with regard to its presence*, is a peculiarity of the lowest groups of the Orchid family, and therefore may be considered an ancient and long established association." The absence of fossil Orchidaceae, which might have produced evidence in support of this theory, is lamented. The author also refers to the discovery of " moral turpitude among the insects " !

The extreme specialization, which is a feature of these associations, might rather be regarded as an indication of a high position in the evolutionary scale. Such an assumption is in accordance with the theory developed by Godfery in his " Monograph of British Orchidaceae," that in the Basitonae at least evolution takes the form of the improvement and increased specialization of the rostellum. *Ophrys* with two separate bursicules protecting the viscidia is a mostly highly specialized genus. Ames' theory is based on the assumption that *Ophrys* is the most primitive genus of the Basitonae, because several authors place it first in their taxonomic arrangement. I have to thank Mr V. S. Summerhayes for the pertinent observation that the presence of the two bursicules is a character which " keys out " well and so leads many authors to place it first in their arrangements.—P. M. HALL.

SIZE OF PLANTS.—The size of plants is determined by three factors: the initial size of the primordium (" capital "), the frequency of cell-division (" rate of interest "), and the period over which the rate of interest is maintained, i.e. up to the onset of senescence. Each of these three factors is in turn governed by heredity and environment. Heredity controls size chiefly through determining the initial size of the primordium, while environment affects size by increasing or decreasing the rate of growth.—Ashby (1937).

(E) ECOLOGY.

TRANSPLANT EXPERIMENTS.—Fourth report on these experiments. See Marsden-Jones and Turrill (1937 B).

GRASSLAND: *Meadows*.—In a comparative study of alluvial meadows bordering the Thames near Oxford, Baker (1937) contrasts floristically a grazed meadow with others consistently cut for hay.

Hill Grazings.—Fenton (1937) discusses the results of experimental work on the influence of sheep on the vegetation of hill grazings in Scotland.

HEATH.—The results of proximate chemical analyses of a heather-peat profile are given by Waksman (1937).

RUDERAL PLANTS.—Bates (1937) discusses the factors affecting the distribution and arrangement of wayside and hedgerow species. The biotic factor is largely responsible for a definite wayside and hedgerow type of vegetation arranged mainly in zones.

DEAD-NETTLE AND STINGING-NETTLE ASSOCIATION.—Further observations into the alleged stimulation of *Lamium album* L. by the presence of *Urtica dioica* L. are described by Poulton (1937).

BRECKLAND.—The second of a series of papers on the ecology of Breckland deals with the influence of the vegetation on the origin and development of blow-outs.—Watt (1937).

(F) NOMENCLATURE.

LINNAEAN SYNONYMY.—Careful study by Savage (1937 A) of a copy of the 14th edition of the " Systema Vegetabilium " (1784) in Linnaeus' library has shown that the annotations therein represent Sir J. E. Smith's record of the Linnaean herbarium as it came into his hands from Sweden. As a result of this investigation it is possible to recover the critical opinion of Banks, Dryander, and Smith upon the Linnaean plants, and light is also thrown on the disposition of the herbarium of the younger Linnaeus. His plants are now in three different herbaria. Some of his own type-specimens are in the Linnaean herbarium: others of his plants are in Smith's herbarium. Linnaeus' second collection (the " *herbarium parvum* "), now preserved at Stockholm, contains 83 specimens (listed by Savage) from the Linnaean herbarium, given by Smith to Banks, who sent them to the younger Linnaeus. Smith's enumeration of the Linnaean herbarium also shows that it has been so well cared for that no type-specimens are missing.

ASTERISKS IN LINNAEUS' " SPECIES PLANTARUM."—Certain citations in the " Species Plantarum " are marked by an asterisk. The explanation of this is that where Linnaeus found it necessary to give a description (as distinguished from a diagnosis or mere list of synonyms) in his earlier works (such as " Flora Zeylanica," " Hortus Cliffortianus " and " Hortus Upsaliensis "), he usually indicated this by marking the citation in " Species Plantarum " with an asterisk. Citations of descriptions by Guettard, Gronovius, C. Bauhin, and Tournefort are similarly marked.—Sprague and Exell (1937).

WILLDENOW'S " HORTUS BEROLINENSIS."—This 2-volume folio work was published at Berlin in fascicles between 1803 and 1816. There has been much uncertainty with regard to the contents and dates of publication of the fascicles. It has now been possible to remove this uncertainty and the contents and dates of the fascicles, as well as the authorities for the decisions taken, are tabulated by Stearn (1937).

(G) MISCELLANEOUS.

Methods of preserving plant material in natural colour are discussed by Scully (1937). Formulae are given which the author has used with fair success.

(H) PHYTOGEOGRAPHY.

HISTORY OF EUROPEAN FLORA: *Cultivation by Early Man.*—In Mecklenburg certain species seem to be connected with the ancient earthworks and settlements of the Wends, and Bauch (1937) considers that it should be inferred that they were then sown in garden fashion, and should be regarded as relicts of former cultivation. The species discussed are too numerous to be mentioned here, most being ornamental or medicinal.

GEOGRAPHICAL ELEMENTS IN BRITISH FLORA.—Matthews (1937) emphasizes the more important geographical connections existing between the flora of the British Isles and that of the Continent. About 640 British species are classified according to their main areas of distribution on the Continent. The species are tabulated under 11 different elements and the distribution of the individual species both within and outside the British Isles is given.

" ATLANTIC " PLANTS.—An account of the occurrence of " Atlantic " species at Spessart (Lower Franconia) is given by Ade (1937). The list includes *Digitalis purpurea, Sarothamnus scoparius,* and several other of our common species, and others more local with us, such as *Microcala filiformis, Corrigiola littoralis,* and others. The topography of the area leaves it affected by winds of Atlantic origin, producing a good rainfall and often almost snow-free winters.

Many British species are dealt with by Jones (1937) in his ecological study of the vegetation of Grimsey, Iceland.

A list of plants, with localities, from N. Manitoba, Hudson Bay and Labrador (Gardner, 1937) includes many common to the British flora and a few adventives from Europe.

ADVENTIVES: *Garden Weeds.*—The sources of origin and persistence of " weeds " in a garden are discussed by Hull (1937 B).

Ballast-heaps.—A list of plants growing on the N. bank of the Tyne thought to have been introduced by the deposit of sand-ballast from foreign sailing-ships is given by Temperley (1937 B).

Pit-heaps.—A list of the plants colonising a pit-heap is given by Heslop Harrison (1937 C).

Aliens in the New Zealand Flora.—A number of British species are among those, whose provenance, method of entry into New Zealand, and dispersal are discussed by Allan (1937). Species introduced at approximately the same time vary very considerably in their rate of spread.

(I) TOPOGRAPHICAL.

BRITISH ISLES: GENERAL.—*Local Floras.*—Redgrove (1937) deprecates the omission of precise information regarding the localities of rare or local plants and makes some additions to the list of Local Floras compiled by Druce in *B.E.C. 1932 Rep.* (1933).

Colloquial Plant-names: *Cumberland.*—An interesting list of about 150 names is given by Murray (1937). *Northumberland.*—Hull (1937 A) gives a list of Northumbrian names, " recollections of the seventies and eighties of last century." *America.*—Several British plants are included in a short list of colloquial American names by Hastings (1937).

N. SOMERSET AND W. GLOSTER: BRISTOL DISTRICT.—Extensions of range and additions to the flora of the Bristol district during the years 1932-36 are recorded by Sandwith (1936 and 1937). Many of the more interesting have already been recorded in past Reports of this Society, and several of the 1936 Records are included in " Plant Records " above.

WILTSHIRE.—Occurrences of noteworthy plants in North and South Wilts during the years 1933-37 are listed by Grose (1937) and Gullick (1937) respectively. Several of these have already been noted in this Society's reports; others will be found in " Plant Records " above.

DORSETSHIRE.—The objects of a Botanical Survey of the county of Dorset and the methods employed are described by Good (1937). The primary aim of the survey is the production of a large number of species-maps. Each map will show the distribution of a single species within the same area. Comparison of these maps will provide material for a full account of the present vegetation of the county and for a complete study in the plant ecology, in addition to furnishing evidence as to factors controlling the range of distribution of species.

SUSSEX.—*The Flora of Sussex* (W.-Dod; 1937) is reviewed elsewhere in this Report. Many corrections to *C.F.* are necessitated, which are dealt with in " Plant Records " above.

YORKSHIRE: *Craven in Wharfedale.*—The account by the late F. A. Lees of the vegetation of this district " with its adjacencies in Aire and Ribble " is being published posthumously in the *North Western Naturalist* as a Supplement (Lees, 1937). After the publication of his *Flora of West Yorkshire* in 1888, Lees worked assiduously at a Supplement which was intended at the same time to embrace the flora of the whole county. This was completed at the end of 1911 but, failing to receive the backing of the Yorkshire Naturalists' Union, Lees used his Supplement as the basis for a Flora of Craven, which was completed between July 1913 and December 1916. On Lees' death in 1921 the MS. was deposited in the Leeds Reference Library but by permission of his widow has now been transcribed for publication in the *N.W. Naturalist* by the Editor, Mr A. A. Dallman. The three instalments (pp. 1-40) published in 1937 cover Ranunculaceae to Compositae (*Carlina*).

NORTHUMBERLAND AND DURHAM.—The topography of Baker and Tate's *New Flora of Northumberland and Durham* (1868) has been carefully checked by Temperley (1937 A). Although Baker and Tate stated that their groups of drainage districts corresponded with Watson's vice-counties, this was not absolutely correct in the case of the two vice-counties of Northumberland. In a few cases the necessary corrections affect vice-comital records: these are referred to in " Plant Records " above. There are in addition several corrections of typographical errors.

SUTHERLANDSHIRE: *Island of Handa.*—A list of the flowering plants and pteridophytes of this small uninhabited island is given by J. W. and H. Heslop Harrison (1937). The list includes several plants of interest, of which three are new to v.-c. 108 and are referred to in " Plant Records " above.

CHANNEL ISLANDS: ALDERNEY.—A list of plants of interest noted during two visits in 1933 and 1934 by Jackson, Jackson, and Airy-Shaw (1937) includes a number of new records for the Island; these have been included in " Plant Records " above.

SYSTEMATIC.

6. RANUNCULUS L. The chromoplasts of several species are described by Beauverie (1937).

6/33. RANUNCULUS FICARIA L. The origin of the tubercles in the axils of the foliage leaves as well as the subterranean tubers has been studied by Metcalfe (1938). Both categories of tuber consist when mature of swollen, starch-containing roots, bearing one or more buds. Additional buds arise adventitiously from this root tissue and the manner in which large complex masses of subterranean tubers or compound aerial tubercles are formed is described in detail. Marsden-Jones' previous description of forms of *R. Ficaria* with aerial tubercles as a genetically distinct variety under the name *bulbifera* is also discussed.

Cross-pollination by insects is indispensable for the full production of viable seed. In the absence of insect visitors selfing takes place, which results either in complete sterility or the production of only a small proportion of viable seed. Marsden-Jones (1937) describes the results of thirty-five observations, covering twenty-six and a quarter hours, between March 15th and May 29th, 1931. Forty-eight species of insects (Coleoptera, Hymenoptera, Lepidoptera, and Diptera) were observed visiting. Weather conditions play an important part.

16/1. PAEONIA MASCULA Mill. The colour of the Steep Holm Peony is a bluish purple, very distinct from the rich red of garden peonies and from the colour of *P. corallina* Retz., as figured in *E.B.*, 1513, ed. 3, pl. 1. It appears that the colour in the plate was altered on account of a remark of J. E. Smith's. Further a stamen drawn enlarged in the plate shows the filament much longer than the anther and the same feature appears in specimens distributed from Steep Holm.—Little (1937).

22/1. MECONOPSIS CAMBRICA (L.) Vig. Chromosomes n=14.—Sugiura (1937).

24/1. ROEMERIA VIOLACEA Med. Chromosomes n=6.—Sugiura (1937).

25/1. CHELIDONIUM MAJUS L. The strophiole of the seeds is of superficial origin and may be likened to a compound hair.—Crété (1937).

The development of the embryo is described by Souèges (1937), who does not confirm Hegelmaier's observations which suggested relationship with Ranunculaceae and Cruciferae: the development is very similar to that in *Papaver Rhoeas* L.

32/10. FUMARIA OFFICINALIS L. Chromosomes (Schleswig-Holstein: Kiel-Wyk) confirmed as n=14 by Wulff (1937: 263).

6. CRUCIFERAE B. Juss. The germination in the tribe *Brassiceae* is described (with figures) by Vassilczenko (1937 B), and its phylogenetic importance discussed. [Russian only.]

37. ARABIS L. The plant which has previously passed in N. America as *A. hirsuta* (L.) Scop. is described as a distinct species, *A. pycnocarpa*, by Hopkins (1937), who gives an account of the N. American species.

49/6. SISYMBRIUM OFFICINALE (L.) Scop. Chromosomes (Schleswig-Holstein: Altona-Sülldorf) n=7.—Wulff (1937: 263).

60/1. CORONOPUS DIDYMUS (L.) Sm. Harper (1937) comments on the external resemblance of this plant to the American Composite, *Gymnostylis*, with which it sometimes grows.

80/4. RAPHANUS SATIVUS L. Hybrids with the Abyssinian mustard (*Brassica carinata*) and their F_2 progeny (all raised in England) have again been studied cytologically by Richharia (1937): in both F_1 and F_2 generations they are said to be "extremely sterile."

85/2. RESEDA LUTEA L. Chromosomes 2n=48.—Eigsti (1936).

88/33. VIOLA LUTEA Huds. Chromosomes (Lindau Alpengarten) n=19-20 (but the v. *elegans*, sub-v. *multicaulis*, from Westphalia had n=26).—Griesinger (1937).

90/2. FRANKENIA PULVERULENTA L. Chromosomes n=10.—Sugiura (1937).

96. SILENE L. SILENE MARITIMA and S. VULGARIS. (1) A mountain plant was received from Wales, which, while agreeing in most characters with *S. maritima*, possessed aberrant characters suggesting either previous contamination with *S. vulgaris* or representing more ancient phenotypic combinations than are now found in coastal *S. maritima*. This plant was selfed and crossed with typical *S. maritima* and *S. vulgaris*. Analyses of various characters and organs and their genetical behaviour are given. (2) Two stocks of *S. vulgaris* from Bulgaria were investigated. The two Bulgarian plants showed little segregation on selfing. On crossing one of them with *S. maritima* from Dorset partial sterility was shown in F_1 and F_2. Considerable segregation occurred in F_2. A predominating influence of the ovule parent was shown for stem length. The results suggest that three or more gene pairs were involved in leaf shape. Segregation occurred for other characters. The plants bred true for armadillo seeds even in the interspecific cross and its offspring. It was further suggested that there are three factor pairs, two dominants of which are essen-

tial, for the production of anthocyanin colour. (3) A wild population of *S. vulgaris* from Somerset was studied in the field and genetically, showing that *S. vulgaris* on a sea cliff can remain as true to its recognized specific characters as an inland population if no *S. maritima* is present. When *S. vulgaris* and *S. maritima* occur together intermediate plants, which show complicated segregations, may be found. (4) The results are given of crossing an Austrian plant with British *S. vulgaris* and *S. maritima*. The Austrian plant was a representative of the high mountain Central European plants which are classifiable as *S. vulgaris* in some characters and recall *S. maritima* in others. Considerable sterility was shown in some crosses and selfings, especially with *S. vulgaris*. On the whole there was no greater complexity of segregation than with British material alone. Even coloured petals appear in some wild British *S. vulgaris*. Most characters behaved genetically as was expected from previous investigations.—Marsden-Jones and Turrill (1937).

96/1. SILENE MARITIMA With. Chromosomes (S. Sweden) n=12.—Griesinger (1937).

96/2. SILENE CUCUBALUS With. ["*S. inflata* Sm."] Chromosomes (S. Tirol: and of subsp. *alpina* (Thomas) also) n=12.—Griesinger (1937).

96/9. SILENE OTITES (L.) Wib. Chromosomes (Tirol: 3 localities) n=12.—Griesinger (1937).

97/4. LYCHNIS DIOICA L. Pistillate plants are higher in dry weight, in the rosette and flowering stages, and are higher in pH, fresh weight and oxydase activity in the flowering stage only. Staminate plants are higher in ash, phosphorus, nitrogen and total sugars in rosette and flowering stages. A table of results by other workers on a number of different dioecious plants, and a useful bibliography of work on sex-differentiation are given.—Stanfield (1937).

97(2). VISCARIA. Chromosomes of both *V. alpina* (L.) Don and *V. vulgaris* Roehl (Garden) n=12.—Griesinger (1937).

102/5. ARENARIA SERPYLLIFOLIA L. Chromosomes (Tirol: many gatherings) n= 20: in one gathering and its offspring n=10 (as in the var. *Marschlinsii* Koch, two plants and their offspring).—Griesinger (1937).

103/1. SAGINA NODOSA (L.) Fenzl. Chromosomes (Schleswig-Holstein: Sylt) 2n=20-24.—Wulff (1937: 262).

103/11. SAGINA PROCUMBENS L. Chromosomes (Schleswig-Holstein) 2n=22.—Wulff (1937: 262).

112/14. HYPERICUM PERFORATUM L. This species is a serious pest ("Klamath weed") in parts of northern California. It is found that tap water retards germination in comparison with distilled water, the retardation being due to the contained calcium (and not to alkalinity in general), which may alter the permeability of the seed coat to water.—Borthwick (1936).

18. MALVACEAE Adans. The arrangement and structure of the extra-floral nectaries is discussed by Janda (1937): *Lavatera arborea*, *Althaea officinalis*, *Malva sylvestris* and *M. rotundifolia* are listed as " K " (with small glandular heads or *Keulen*-hairs) and " St " (with stellate hairs and other covering hairs).

132/1. OXALIS ACETOSELLA L. The occurrence of this species as an epiphyte in the Llangwm district of Denbighshire is recorded by Dallman (1937 B). A number of plants were growing at about 4 feet above the ground in a dense mass of the moss *Eurhynchium myosuroides* Schp. The conditions of the locality were very humid and shady.

132/3. OXALIS STRICTA L. Chromosomes (Schleswig-Holstein: Kiel) n= 12.—Wulff (1937: 262), who notes that for *Oxalis corniculata* L. the number is only given as 11-12.

137/1. EVONYMUS EUROPAEUS L. Chromosomes (Schleswig-Holstein): " tetraploid (n=32)."—Wulff (1937: 264).

138/1. RHAMNUS FRANGULA L. Chromosomes (Schleswig-Holstein) n= 13.—Wulff (1937: 264, as *Frangula alnus* Mill.).

154/2. MELILOTUS ALBA L. The vascular anatomy of the seedling is described by McMurry & Fisk (1936) as similar in method of transition to that described in *M. arvensis*, *Medicago*, *Trigonella*, *Ononis* and *Trifolium*.

189/25. COMARUM PALUSTRE L. Chromosomes (Schleswig-Holstein) 2n= 14.—Wulff (1937: 263).

194. ROSA L. First results of " crossing experiments " between sexual and apomictic roses are described by Gustafsson (1937 A, English summary): all offspring resembled the mother parent, i.e., no crossing occurred. Two aberrant plants are regarded as mutations.

194/23. ROSA SPINOSISSIMA L. A plant of this species, transferred to a garden in 1918, flowered freely for several years but produced no fruits. Later another set of plants of the same species from a different locality was planted nearby with the result that both series fruit freely. This confirms the view that sexual roses are self-sterile.—Heslop Harrison (1937 A).

211/6. SEDUM ACRE L. Chromosomes (Schleswig-Holstein: Kiel) n= 24.—Wulff (1937: 263), who notes that Toyohuku (1936: *Japan. Journ. Genetics*, *11*, 316-317) found n=8 on material from England.

213/1. DROSERA ANGLICA Huds. The capture of a Dragon-fly, *Agrion minium*, and a Northern Brown Butterfly is recorded by Heslop Harrison (1937 B).

213/3. DROSERA ROTUNDIFOLIA L. The capture of a Dragon-fly, *Agrion minium*, and a Large Heath Butterfly is recorded by Hull (1937 C).

The insect catch of this species on a moor in Germany (Grenzmark) has been analysed in detail by Münchberg (1937). The ecological (habitat) relations of the various species are given.

[I would put on record my observation (in 1913) of a Small White (or Green-veined White: I did not note which) Butterfly held fast on this species in Surrey (Oxshott Black Pond)—A.J.W.]

Vegetative propagation from leaves is described by Moulaert (1937). Regeneration takes place by the formation of a bud at the base of a tentacle on the upper side of the leaf, the ordinary epidermal cells becoming meristematic. Adventitious roots may be formed from this same meristem, or may develop from a meristem of ordinary parenchyma cells in the leaf at the base of the new bud and traverse the thickness of the leaf to emerge on the lower surface.

223. OENOTHERA L. A full account of the forms of this genus naturalised in N. Germany is given by Renner (1937). A synopsis of the species and varieties is added (p. 219) and the various hybrids are named.

285/2. CORNUS SUECICA L. The distribution of this species in the Hole of Horcum, Saltersgate, N.E. Yorks, has been the subject of detailed investigation by Flintoff and Britten (1937). In this locality it is stated that the species flourishes best in association with *Pteris*, the flowering period (third week in May to first week in July) preceding the maximum development of *Pteris*. It is considered that the *Cornus* is of comparatively recent origin in this locality, being spread by birds (especially Ring Ousels) feeding on the drupes. An excellent photograph of this species in flower accompanies this paper.

The pollination of this species has been studied by Dallman (1937 D), who publishes a list of 12 species of Coleoptera, Diptera and Hymenoptera observed visiting it. There is no record of previous British observations on this species.

306/1. DIPSACUS SYLVESTRIS L. This was recorded as an adventive by K. Brandegee in *Zoe*, *2*, 383 (1892) as a naturalized plant of San Francisco, growing "behind and above Presidio proper." The plant still flourishes at this place, whence it has not spread, but another locality is given and it is suggested that the plant may have been confused with *D. fullonum* L. and is perhaps more common than has been realized.—Howell (1937 B).

324/3. FILAGO GERMANICA (L.) Huds. Chromosomes (Bot. Gard., Kiel) 2n=28.—Wulff (1937: 265).

328/1. GNAPHALIUM LUTEO-ALBUM L. This adventive in Great Britain is becoming an aggressive weed in California, where it has been undetected hitherto, owing to its resemblance to a slender form of *G. chilense* Spreng.—Howell (1937 A).

334/2. PULICARIA VULGARIS Gaertn. Chromosomes (Bot. Gard., Kiel) 2n=18.—Wulff (1937: 265), although *P. dysenterica* has n=10.

368. ANTHEMIS L. Chromosomes of both *A. arvensis* L. and *A. Cotula* L. (Bot. Gard., Kiel) are 2n=18.—Wulff (1937: 265).

371/2. MATRICARIA CHAMOMILLA L. This species is mentioned by Turrill (1937) among those used in the Balkan Peninsula in place of tea. The " tea " is probably most often made for medicinal purposes but the infusion is scarcely bitter and is very pleasing to drink.

371/3. MATRICARIA DISCOIDEA DC. Chromosomes (Schleswig-Holstein) n=9.—Wulff (1937: 265).

372/3. COTULA CORONOPIFOLIA L. Chromosomes 2n=20.—Wulff (1937: 265).

383/5. SENECIO JACOBAEA L. Green (1937) observes that the fruits of the ray florets with deciduous pappus are retained within the involucral cup, after the dispersal of the fruits with pappus. It is suggested that the ray fruits are responsible for the colonization of suitable ground in the immediate vicinity of the plant.

393/3. ARCTIUM MINUS (Hill) Bernh. Chromosomes (Bot. Gard., Kiel) 2n=32.—Wulff (1937: 265).

396. CIRSIUM Mill. Chromosomes of *C. acaule* (L.) Weber and *C. heterophyllum* (L.) Hill (Schleswig-Holstein) have both 2n=34.—Wulff (1937: 265).

405/1. CENTAUREA JACEA L. Chromosomes (Bot. Gard., Kiel) 2n=44.—Wulff (1937: 266).

415/1. PICRIS ECHIOIDES L. A list of six species of Diptera captured when visiting this species is given by Dallman (1937 C). There are no previous records of British observations on the pollination of this species and the only visitor previously noticed (by Sprengel) is the Honey Bee.

416/5. CREPIS CAPILLARIS (L.) Wallr. Chromosomes: " there is no evidence of somatic pairing in metaphasic figures "—Matsuura (1937: 218). Two marked dividing periods and two resting periods during a day's growth were observed by H. Ono (1937).

422/3. THRINCIA HIRTA Roth. Chromosomes (Bot. Gard., Kiel) 2n=10, one pair with conspicuous trabants.—Wulff (1937: 266).

423. TARAXACUM Zinn. The occurrence of a sexual population within the apomictic *Taraxacum vulgare* group is described by Gustafsson (1937 B).

427/1. SONCHUS PALUSTER L. Chromosomes (Bot. Gard., Kiel) 2n=18.—Wulff (1937: 267).

427/2. SONCHUS ARVENSIS L. Chromosomes (Schleswig-Holstein: dunes at Amrum) n=32.—Wulff (1937: 267).

435/1. CAMPANULA GLOMERATA L. Chromosomes (Tirol) n=15.—Griesinger (1937).

435/7. CAMPANULA RAPUNCULUS L. Chromosomes: n=51.—Sugiura (1937: 425).

445/1. CALLUNA VULGARIS (L.) Hull. Germination is found to occur in sterilised earth, but the growth is rapidly arrested and the shoot reddens: this is considered to be due to the changed physical (possibly also chemical) state of the soil which becomes compact,

and not due to absence of mycorrhiza. In sterile culture solution normal growth for twenty-two months has been obtained without any sign of mycorrhiza.—Molliard (1937).

458/2. ARMERIA MARITIMA Willd. Chromosomes (garden: 2 sources) n=9, as in *A.* "*arctica*, *A. alpina*, etc."—Griesinger (1937).

459/1. HOTTONIA PALUSTRIS L. The epidermis of both subaerial and submerged forms is described by Lavier-George (1937): the species can live as well out of water as submerged.

465/1. TRIENTALIS EUROPAEA L. Chromosomes (Schleswig-Holstein) n= circa 80: Wulff (1937: 264), who notes that this extraordinarily high number may have significance, since the plant has a northern distribution and develops very slowly, producing fruit only several years after germination, in spite of its small size.

467/2. ANAGALLIS ARVENSIS L. Chromosomes (Schleswig-Holstein) n= 20.—Wulff (1937: 264).

471/1. FRAXINUS EXCELSIOR L. The occurrence in Germany of white or variegated seedlings is described by Funk (1937). The cotyledons are usually green (very rarely white speckled or striped) and subsequent leaf pairs vary to complete lack of chlorophyll, or there may be transitions in later pairs to green leaves. They originate only from certain individual (? heterozygous) trees.

486/1. POLEMONIUM COERULEUM L. Chromosomes (Bot. Gard., Hamburg and Berlin) n=9, as also in the var. *himalayanum* Bak., and in the arctic *P. humile*.—Griesinger (1937).

506/6. MYOSOTIS ALPESTRIS Schmidt. Chromosomes (Tirol: 3 localities) n=12.—Griesinger (1937).

506/7. MYOSOTIS SYLVATICA (Ehrh.) Hoffm. Chromosomes (Tirol: two plants, as "subsp. *silvatica* Ehrh.") n=9 in one, 16 in the other. —Griesinger (1937).

511/4. CALYSTEGIA SOLDANELLA Br. Seeds moistened with a solution containing a small quantity of salt were found to germinate equally well as with tap water, but showed a marked falling off with a larger amount of salt: the growth of the seedlings also diminished with increase in salt and stopped altogether when 3/4 and 1/1 artificial sea water were used.—Tsuda (1937).

517/2. SOLANUM NIGRUM L. Two forms occur in Formosa, one with chromosomes 2n=12, another with larger reproductive organs, thicker leaves and chromosomes n=36 (autohexaploid ?): the pollen of the latter is large: triploid and dodecaploid forms are mentioned.—Nakamura (1935: ex *Jap. J.B.*, *9*, Abstracts, p. 16).

524/1. HYOSCYAMUS NIGER L. Chromosomes (Budapest Drug station) n=17. (*H. albus* has n=34).—Griesinger (1937).

543/8. VERONICA ANAGALLIS-AQUATICA L. The effect of aerial and aquatic environments on the form, flowering and anatomy, and of transference from each environment to the other on flowering, are studied by Gertrude (1937). The different forms obtained are illustrated by photographs.

543/19. VERONICA AGRESTIS L. Chromosomes (Schleswig-Holstein) n=14.—Wulff (1937: 265).

543/41. VERONICA FILIFORMIS Sm. has been confused with *V. Tournefortii* Gmel. Even Smith himself confused the two plants in his herbarium. It differs from *V. Tournefortii* in the more slender stems, the leaves only 5-10 mm. broad, the sub-orbicular capsule with its long style and seeds 1/3 the size. The plant is a native of the Near East but has occurred adventive in several stations in France and has been reported previously by A. Chevalier from the Channel Islands.—Touton and Courcelle (1937).

569/1. NEPETA CATARIA L. The development of the female gametophyte is described and figured (figs. 17-22) by Bushnell (1936 A). Chromosomes n=16.—Bushnell (1936 B).

581/3. LAMIUM PURPUREUM L. Chromosomes (Munich Bot. Gard.) n=9.—Griesinger (1937).

588/5. PLANTAGO MARITIMA L. Chromosomes (Schleswig-Holstein) n=6 (whereas *P. alpina* L. has n=12).—Griesinger (1937).

588/8. PLANTAGO LANCEOLATA L. Illustrations of teratological forms and tables of experimental cultivations are given by Flintoff (1937). The monstrosities took the form of branched and umbelliferous inflorescences, fasciation, stem branching, and the appearance of foliaceous bracts. The conclusion is reached that these phenomena were not the result of the action of insects or fungi, or of the nutritional stimulation of rich soil, but probably represent atavisms.

594/1. CORRIGIOLA LITTORALIS L. Chromosomes n=8.—Sugiura (1937).

611/4. SALICORNIA HERBACEA L. The seed (with figure) and germination is described by Vassilczenko (1937 A).

626/1. VISCUM ALBUM L. The water-relations of this species have been studied by Härtel (1937).

628. EUPHORBIA L. A summary of morphological interpretations of the cyathium, introducing recent theoretical considerations of the species-concept, is given by Croizat (1937).

628/14. EUPHORBIA PEPLUS L. Chromosomes (Schleswig-Holstein: Kiel) n=8.—Wulff (1937: 264).

628/16. EUPHORBIA LATHYRIS L. Recorded for Sweden by Hässler (1937), with a general account of the distribution of the species.

633/1. ULMUS MONTANA Stokes. A tree in Aberdeenshire is 16 ft. 7 in. in girth, 80-90 ft. high, forking at 20-25 ft.—Ainsley (1937).

634/1. HUMULUS LUPULUS L. Chromosomes of the Japanese var. *cordifolius* (Wild Hops) are described by T. Ono (1937) and compared with those of *H. Lupulus* L.: male plant and female plant differ in both.

642/1. BETULA VERRUCOSA Ehrh. Pollen: details of size and weight, etc., are given, and ecological relations discussed.—Pohl (1937).

643/1. ALNUS GLUTINOSA Gaertn. Pollen: details of size and weight, etc., are given, and ecological relations discussed.—Pohl (1937).

645/1. CORYLUS AVELLANA L. Pollen: details of size, weight, etc., are given, and ecological relations discusesd.—Pohl (1937).

649/1. FAGUS SYLVATICA L. That the Beech is native and was not introduced by the Romans has been indicated by the presence of its pollen in peat from Northumberland, the Fens, and elsewhere. Confirmation is given by the identification of Beech charcoal from an Iron Age prehistoric hearth near Cardiff.—Hyde (1937).

Pollen: details of size, weight, etc., are given, and ecological relations discussed.—Pohl (1937).

87. SALICACEAE Lindl. The possibility of crossing different species of *Salix* and *Populus* can be tested on cut twigs kept in vases, especially useful when the time of flowering is different, see Wettstein (1937), who gives an account of some hybrids of importance in basket work and horticulture.

651/2. POPULUS TREMULA L. A " giant " form (" *P. t. gigas* "), with foliage four to five times as large as normal, is described from Sweden (Medelpad) by Blomquist (1937). Its behaviour on crossing is mentioned by Wettstein (1937: 283), and its chromosomes (triploid: 57 ± 1) are described by Tometorp (1937).

656/1. ELODEA CANADENSIS Michx. The root hairs have been studied by Cormack (1937), who finds that root hairs—normally formed only in soil—are produced in water in the dark. In water and light the roots are green and possess a cuticle: in the dark not so. It is suggested that the cuticle formation is due to the presence of chlorophyll and its toughness prevents the formation of root hairs.

The meristem of the vegetative shoots is described by Chouard (1937).

678/1. CROCUS NUDIFLORUS Sm. The meristem of the vegetative shoots is described by Chouard (1937).

678/3. CROCUS BIFLORUS Mill. Chromosomes confirmed 2n=8.—Karasawa (1937).

93. AMARYLLIDACEAE Lindl. The long-debated question of the nature of the " corona " is dealt with by Arber (1937). The evidence from a comparative study of the form and anatomy of the stamen-cup and " corona " is held to prove that the stamen-cup belongs to the androecium, while the " corona " of *Narcissus* is independent of the stamens and is best interpreted as an outgrowth of the perianth tube.

685/1. GALANTHUS NIVALIS L. Chromosomes: generally 2n=24 (4L+14M+6S) but variations occur and are discussed by Satô (1937 B).

686. LEUCOJUM L. *L. vernum* [also var. *carpathicum*] and *L. aestivum*. Chromosomes [Japan ?] 2n=22 (" four classes "): Satô (1937 A), one pair with median constrictions distinguishable from remainder with subterminal constrictions.

688/1. TAMUS COMMUNIS L. A detailed discussion of the life-cycle of this species, under the headings fruit-ripening and seed-dispersal,

fertility, the seed between fruit-ripening and the emergence of the seedling, growth of the plant to maturity, and flowering, is given by Burkill (1937).

702/11. ALLIUM SCHOENOPRASUM L. "Pseudo-bivalent" chromosome formation following X-ray treatment is illustrated by Levan (1937).

703/1. MUSCARI RACEMOSUM L. Embryology described and figured; chromosomes n=27.—Wunderlich (1937: 48, 59, 74).

706/3. ENDYMION NON-SCRIPTUS (L.) Garcke. The meristem of the vegetative shoots is described by Chouard (1937).

710. TULIPA L. The chromosome numbers of 71 species have been obtained, the basic number for the genus being 12. *T. sylvestris* L. is a tetraploid, 2n=48, and is considered to have been derived from the diploid *T. australis* Link (*T. Celsiana* Vent.). These two species have been much confused in Floras but have distinct distributions.—Hall (1937).

718/5. JUNCUS GLAUCUS Ehrh. Chromosomes (Bot. Gard., Kiel) 2n=40.—Wulff (1937: 268).

721. TYPHA L. Pollen: details of size, weight, etc., given for both species, and the ecological relations discussed by Pohl (1937).

724/1. ACORUS CALAMUS L. Perry (1937) discusses the history, distribution, medicinal properties, and commercial value of this species.

103. NAIADACEAE Lindl. The origin of *Naias* and *Potamogeton* is discussed by Miki (1937), who thinks the former may be derived from submerged Hydrocharitaceae and the latter from Pandanales or Synanthae.

749/1. SCHOENUS NIGRICANS L. The wide range of habitats, associated with very slight morphological variation, is regarded by Allorge (1937) as a problem: possibly physiological differences and several ecotypes exist.

750/1. CLADIUM MARISCUS (L.) R.Br. The autecological study of this species is continued by Conway (1937): part iii. "The aeration of the subterranean parts of the plant." Leaves are of different types and air passes to the roots less easily in some types. In unaerated mud the roots depend for air on the bases of dead leaves and on leaves which though green are not growing.

753/45. CAREX STRICTA Good. (*C. Hudsonii* Ar. Benn.). This species is abundant and ecologically important in Connecticut and Wisconsin, dominating tussock meadows along stream and pond margins on soils containing much organic matter. New tussocks grow from rhizomes emitted from the bases of old tussocks. The tussock habit is adapted to seasonal changes of water level, the rhizomes and roots having structure adapted to very wet conditions and the leaves a xeromorphic structure adapted to occasional desiccation. A long account of the ecology of the species is given by Costello (1936).

753/67. CAREX ARENARIA L. Chromosomes (Schleswig-Holstein) 2n=64. —Wulff (1937: 267).

758/3. SPARTINA TOWNSENDII H. & J. Groves. The floral morphology is described in detail by Curtis (1937).

780/6. AGROSTIS CANINA L. Chromosomes (Bot. Gard., Kiel) 2n=28.—Wulff (1937: 267).

787/1. AMMOPHILA ARENARIA (L.) Link. Chromosomes (Schleswig-Holstein) n=14.—Wulff (1937: 267).

789/1. AIRA CARYOPHYLLEA L. Chromosomes (Schleswig-Holstein: Westensee) n=7.—Wulff (1937: 267).

813/1. MOLINIA COERULEA (L.) Moench. An account of the Bavarian forms of this species is given by Paul (1937), who distinguishes "ssp. *M. coerulea* (Moench)" with several varieties from a subsp. "*M. litoralis* (Host)," with three further varieties.

824/2. POA PRATENSIS L. The seed setting has been investigated by Nilsson (1937 A), who finds pollen necessary for seed development. The percentage of normal pollen varies, and also the seed setting, which is higher in open-pollinated plants, but the bagging to ensure self-pollination may for purely physiological reasons have a lowering effect.

824/14. POA ANNUA L. A study of the chromosome numbers of this species 2n=28, [14b] *P. supina* Schrad. 2n=14, and [14g] *P. exilis* (Tomm.) Murb. 2n=14 is given by Nannfeldt (1937 B). *P. annua* is intermediate in most characters between the other two, and the possibility of its hybrid origin is discussed. The characters are set out at some length on pp. 248-9.

824/14b. POA ANNUA L., var. VARIA Gaud. (*P. supina* Schrad.). This plant is considered by Nannfeldt (1937 C) as a distinct species from *P. annua*, and he gives details (with a map) of its distribution in Scandinavia.

827/19. BROMUS HORDEACEUS L. Artificial hybrids between this and *B. mollis* are described by Nilsson (1937 B): they are almost completely fertile and the F_2 generation shows great variation.

827/19(2). BROMUS LEPIDUS O. R. Holmberg. Some further details of the distribution of this species are given by H. Hylander (1937): partly from Sweden (Göteborg, Stockholm, Uppsala) and partly from Germany (Rügen). Commonly it is associated with newly sown English Rye-grass and with *B. mollis* (sometimes *B. arvensis*).

834/1. NARDUS STRICTA L. Anatomy, mode of growth and Nardeta are described by Busch (1937: Russian only).

839/1. JUNIPERUS COMMUNIS L. Pollen: details of size, weight, etc., are given, and ecological relations discussed.—Pohl (1937).

840/1. TAXUS BACCATA L. Pollen: details of size, weight, etc., are given, and ecological relations discussed.—Pohl (1937).

841/1. PINUS SYLVESTRIS L. Pollen: details of size, weight, etc., are given, and ecological relations discussed.—Pohl (1937).

844. EQUISETUM L. Hydathodes of the epithem type, reported for the twenty-two species studied, are described in detail by Johnson (1937), who states that they are of no value in determining the degree of relationship between the species.

854/4. POLYSTICHUM LONCHITIS (L.) Roth. This has now been found in Bohuslän, Sweden: Binning (1936).

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NOTE.—This bibliography refers not only to the Abstracts from Literature but to the contents of the Report in general, except such papers as may have their own bibliography.

ABBREVIATIONS OF TITLES OF PERIODICALS

additional to lists previously published in *B.E.C. 1935 Rep.*, 153-155 (1936) and *B.E.C. 1936 Rep.*, 383 (1937).

ASN, Bot.=Annales des Sciences Naturelles, Botanique.
B.Bayer.B.G.=Berichte der Bayerischen Botanischen Gesellschaft.
Contrib. Gray Herb.=Contributions from the Gray Herbarium of Harvard University.
Emp.For.J.=Empire Forestry Journal.
J.Ind.BS.=The Journal of the Indian Botanical Society.
JRHS.=The Journal of the Royal Horticultural Society.
Orch.Rev.=The Orchid Review.
P.Bristol NS.=The Proceedings of the Bristol Naturalists' Society.
Sov.Bot.=Sovietska Botanica.
Wilts.A.M.=The Wiltshire Archaeological and Natural History Magazine.

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SUPPLEMENT.

PANEL OF REFEREES.

The rules of our Society provide for the preparation from time to time by the Committee of a list of Referees for the naming of critical groups or special plants. The Editorial (Publications) Sub-Committee, to whom the preparation of this list is delegated, have decided that a Panel of Referees should be formed consisting of all those botanists who are contributing to the *New Students' British Flora*, now in course of preparation. The immediate benefit of this arrangement to the members of this Society is obvious, while in addition it is hoped that much assistance will be obtained in the revision-work which will be necessary in connection with new editions of the *British Plant List* and of the *Comital Flora*, which may be called for before long.

The contributors to the *New Students' British Flora* have accordingly been invited to join the B.E.C. Panel of Referees and below are set out their names and addresses, the families (or other groups) which they have undertaken, and in several cases special notes as to desiderata, collecting methods and so on. Practically all these gentlemen have consented to act: in a very few cases replies have not yet been received but it is anticipated that these too will be favourable.

Regard should be had to the following considerations:—

i. Although the Referees collectively cover all the families of Phanerogams and Pteridophytes in the British flora, it is not intended that the help of Referees should be enlisted for the general naming of plants for members. For this purpose plants should continue to be submitted to the Honorary Secretary.

ii. Referees will receive for naming plants of groups which are known to be critical.

iii. Plants showing variation from type, plants suspected to be of hybrid origin, and gatherings illustrating extensions of geographical range will also be acceptable. Information as to status, habitat, soil, etc., is valuable.

iv. Fresh or dried material may be submitted. Fresh material should always be sent in *tins* (but see special instructions as to *Salicornia*), and such material will not be returned to the sender except in special circumstances and by arrangement. Dried material will only be returned if the sender encloses the cost of return postage.

v. It cannot be emphasized too strongly that Referees will not wish to see material of plants which are notable only for their rarity.

Changes which may occur from time to time in the constitution of the panel and notes as to special desiderata will be published in the Society's Reports. It is hoped that the members of this Society will respond readily to this opportunity of contributing to botanical work of national importance by supplying Referees with the material they require.

PANEL OF REFEREES.

NOTE.—The family names used and the sequence of genera are taken from the 11th edition of the *London Catalogue*.

AIRY-SHAW, H. K., Royal Botanic Gardens, Kew, Surrey

ERICACEAE.
MONOTROPACEAE.
VACCINIACEAE.

ALSTON, A. H. G., British Museum (Natural History), Cromwell Road, London, S.W.7.

EQUISETACEAE.
FILICES.
LYCOPODIACEAE.
MARSILEACEAE.
SALVINIACEAE.
SELAGINELLACEAE.

Mr Alston is especially interested in hybrid ferns and would like to see any suspected of hybrid nature. He would also be glad to have more material of the following:—*Equisetum litorale*; *E. hyemale*; *Asplenium lanceolatum* var. *obovatum*, var. *microdon*; *A. Adiantum-nigrum* var. *serpentini*, var. *acutum*, var. *microdon*; *A. Ruta-muraria* var. *elatum*, var. *pseudo-germanicum*; *Polystichum angulare* var. *hastulatum*, var. *alatum*, var. *Braunii*; *P. aculeatum* var. *lobatum*; *Lastraea Filix-mas* var. *pumila*, var. *abbreviata*; *L. spinulosa* var. *glandulosa*; *L. aristata* var. *tanacetifolia*, var. *lepidota*; *Botrychium Lunaria* var. *incisum*; *Ophioglossum vulgatum* var. *polyphyllum*; *Azolla caroliniana* (the true plant as opposed to *A. filiculoides*).

ANTHONY, J., Royal Botanic Gardens, Edinburgh, 4.

LABIATAE (except *Mentha*, *Origanum*, *Thymus*, *Calamintha*, *Salvia*, *Prunella*, and *Galeopsis*).

Mature seeds are required of *Ajuga Chamaepitys* Schreb., *Stachys germanica* L., *S. arvensis* L., *Teucrium Scordium* L., *T. Botrys* L., *T. Chamaedrys* Benth., and *Ballota ruderalis* Sw.

ASH, G. M., Lower Birtley Farm, Witley, Surrey.

ONAGRACEAE (except *Oenothera*).

Epilobium material, fresh if possible, is welcome, together with as much information as possible as to other species growing in the neighbourhood.

BAKER, E. G., British Museum (Natural History), Cromwell Road, London, S.W.7.

MALVACEAE.
PLANTAGINACEAE.

Material agreeing with the descriptions of the new varieties of *Plantago* printed on p. 455 is especially desired.

BALLARD, F., Royal Botanic Gardens, Kew, Surrey.

CYPERACEAE (except *Carex*).

BRITTON, C. E., 85 Hamsey Green Gardens, Warlingham, Surrey.

POLYGONACEAE (except *Rumex*).
RUBIACEAE.
SCROPHULARIACEAE (*Melampyrum*).

Plants submitted should be as complete as possible. In the case of *Melampyrum* they should be carefully gathered so as to show the root and lower leaves, and not less than four examples of any one gathering.

BULLOCK, A. A., Royal Botanic Gardens, Kew, Surrey.

ARALIACEAE.
CAPRIFOLIACEAE.
CORNACEAE.
FRANKENIACEAE.
LYTHRACEAE.

Notes on frequency, soil, etc., are welcomed and, in the case of *Lythraceae*, notes on the relative frequency of the various sexual (heterostylic) forms.

BURTT, B. L., Royal Botanic Gardens, Kew, Surrey.

DIPSACACEAE.
LEGUMINOSAE (*Vicia* and *Lathyrus*).
VALERIANACEAE.

The distribution of the forms recognized by Drabble (*B.E.C. 1932 Rep.*, 249, 1933) as *Valeriana angustifolia* and *V. sambucifolia* is very imperfectly known. Mr Burtt will be glad to see specimens from as many localities as possible, accompanied by notes on habitat, etc.

BUTCHER, Dr R. W., 68 St James' Street, Nottingham.

CRUCIFERAE (except *Barbarea*).
NAIADACEAE (*Zannichellia* and *Naias*).
RANUNCULACEAE.

CLARK, Dr W. A., Dept. of Botany, King's College, Newcastle-on-Tyne, 2.

CONVOLVULACEAE.
HYPERICACEAE.
SOLANACEAE.

Dr Clark will be pleased to receive material in any of these groups.

DANDY, J. E., British Museum (Natural History), Cromwell Road, London, S.W.7.

ALISMATACEAE.
ERIOCAULACEAE.
HYDROCHARITACEAE.
NAIADACEAE (except *Zannichellia*, *Zostera* and *Naias*).

Dr G. Taylor (see below) is co-operating with Mr Dandy in *Potamogeton* and *Ruppia*. They appeal to collectors (a) to submit any material of *Potamogeton*, whether new or old, in order that they may revise all previous determinations, and (b) to make special efforts to collect Potamogetons in *new* localities, as it is desired to make as complete a record as possible of the distribution of each species.

Collectors visiting Ireland are asked to collect Potamogetons from the Inny River below Ballymahon, where it forms the boundary between Counties West Meath and Longford, about 3 miles from Lough Ree. In 1885 R. M. Barrington collected here a *Potamogeton* which looks like the very rare hybrid, *P. sparganifolius* (*P. Kirkii*), but the specimen is too poor for certain identification.

EXELL, A. W., British Museum (Natural History), Cromwell Road, London, S.W.7.

ELATINACEAE.
NYMPHAEACEAE.
PORTULACEAE.
RESEDACEAE.
TAMARICACEAE.

GATES, Prof. R. R., University of London, King's College, Strand, London, W.C.2.

ONAGRACEAE (*Oenothera*).	Material and seeds of any species naturalized in Britain are required.

GILMOUR, J. S. L., Royal Botanic Gardens, Kew, Surrey.

ARACEAE. GENTIANACEAE (except *Gentiana*). LABIATAE (*Prunella and Galeopsis*). LEGUMINOSAE (except *Lupinus* to *Ononis*, *Anthyllis*, *Vicia* and *Lathyrus*). OLEACEAE. POLEMONIACEAE.	*Gentianaceae*. Material is required of the narrow-leaved Centauriums grouped under *C. littorale*, especially from the southern coasts of England. *Labiatae*. Material is required of forms of *Galeopsis Ladanum* and *G. Tetrahit*, especially of the broad-leaved forms of the former which have been called *G. intermedia*, and of the forms of *G. Tetrahit* which have been called *G. bifida*.

HALL, P. M., 12 High Street, Fareham, Hants.

LENTIBULARIACEAE. ORCHIDACEAE. VIOLACEAE.	For desiderata in *Utricularia* and *Viola* see *B.E.C. 1936 Rep.*, 217-218, 1937.

HOWARTH, Dr W. O., Botany Dept., The University of Manchester, Manchester, 13.

GRAMINEAE (*Festuca*).	Dr Howarth would be glad to receive *any* varieties, particularly the *glaucous* (grey-green) and *pruinose* (waxy) forms of *ovina* and *rubra*, including the coastal forms of the latter. Will anyone collecting "on the heaths around Bury St Edmunds," look out for forms of *F. ovina* which Smith called *F. caesia*? In collecting *Festuca*, it should be noted that the rooting part is as important as the flowering part. Points of importance are presence or absence of stolons, intravaginal and extravaginal branching, closed or open sheaths to sterile shoots. Information as to habitat is of value. Material from Scotland and Ireland is particularly desired.

HUBBARD, C.E., Royal Botanic Gardens, Kew, Surrey.

GRAMINEAE (except *Agrostis* and *Festuca*).	Specimens of *Poa*, *Bromus* and *Agropyron* are required, especially from Scotland, Wales, Ireland and the northern counties of England.

HYDE, H. A., Dept. of Botany, National Museum of Wales, Cardiff.

TILIACEAE.	See paper in *Report* for 1937.

JACKSON, A. B., 3 The Avenue, Kew Gardens, Surrey.

CRUCIFERAE (*Barbarea*). CONIFERAE. SALICACEAE (*Populus*).	Material of *Barbarea* and *Populus* will be welcomed.

JACKSON, A. K., Royal Botanic Gardens, Kew, Surrey.
CRASSULACEAE.
LABIATAE (*Origanum*).

LOUSLEY, J. E., 7 Penistone Road, Streatham Common, London, S.W.16.
COMPOSITAE (*Cichorium* to *Crepis*, *Hypochaeris*, *Leontodon*, *Lactuca* to *Scorzonera*).
POLYGONACEAE (*Rumex*).
SCROPHULARIACEAE (except *Euphrasia*, *Rhinanthus* and *Melampyrum*).
Mr Lousley will be especially pleased to see fresh or dried material of *Rumex* for examination. This should be in ripe fruit wherever possible and should include the lowest leaves obtainable. In the case of suspected hybrids details of the associated species will be appreciated. Alien species of *Rumex* are particularly desired.

MARSDEN-JONES, E. M., Church House, Potterne, Devizes, Wilts.
ROSACEAE (*Geum*).
—— (with Dr W. B. TURRILL).
COMPOSITAE (*Centaurea*).
Fresh material and ripe seed are desired of *C. Calcitrapa*, *C. Solstitialis* and *C. paniculata*, and dried material of the *nigra*, *nemoralis* and *Jacea* groups would be valuable.
—— (with Prof. F. E. WEISS).
PRIMULACEAE (*Anagallis*).
Blue-flowered Pimpernels, fresh material preferred, would be very welcome and may be sent to either Referee.

MELVILLE, Dr R., Royal Botanic Gardens, Kew, Surrey.
LINACEAE.
PRIMULACEAE (except *Anagallis*).
URTICACEAE.

METCALFE, E. H., Dept. of Horticultural Botany, Reading.
LABIATAE (*Mentha*).
With A. L. Still (see below).

MILNE-REDHEAD, E., Royal Botanic Gardens, Kew, Surrey.
CAMPANULACEAE.
Living plants or seeds are required of *Campanula rotundifolia*, especially from Scotland and Ireland.

NELMES, E., Royal Botanic Gardens, Kew, Surrey.
CYPERACEAE (*Carex*).
A look-out should be kept for *C. trinervis* on the east coast. Material of the more uncommon, especially Scottish, species would be welcome, as well as material of forms, varieties and hybrids.

NORMAN, C., British Museum (Natural History), Cromwell Road, London, S.W.7.
UMBELLIFERAE.

PHILIPSON, W. R., British Museum (Natural History), Cromwell Road, London, S.W.7.
COMPOSITAE (*Eupatorium* to *Senecio*).
GRAMINEAE (*Agrostis*).

PUGSLEY, H. W., 81 Alexandra Road, Wimbledon, London, S.W.19.

AMARYLLIDACEAE.
COMPOSITAE (*Hieracium*).
FUMARIACEAE.
GENTIANACEAE (*Gentiana*).
JUNCACEAE (*Juncus alpinus*).
LABIATAE (*Calamintha* and *Salvia*).
OROBANCHACEAE.
PLUMBAGINACEAE.
SCROPHULARIACEAE (*Euphrasia*).

Mr Pugsley cannot undertake to name *Hieracia* until his revision of the genus is completed.

It is desired that fresh specimens only of *Orobanche* should be sent.

RICHARDS, Dr P. W., The Botany School, Cambridge.

JUNCACEAE (except *Juncus alpinus*).

SEALY, J. R., Royal Botanic Gardens, Kew, Surrey.

ACERACEAE.
AQUIFOLIACEAE.
CELASTRACEAE.
LEGUMINOSAE (*Lupinus* to *Ononis*).
RHAMNACEAE.

SLEDGE, Dr W. A., Botany Dept., The University, Leeds, 2.

ARISTOLOCHIACEAE.
COMPOSITAE (*Carlina* to *Serratula*).
ELAEAGNACEAE.
EUPHORBIACEAE.
LORANTHACEAE.
SANTALACEAE.
THYMELEACEAE.

STEARN, W. T., 63 Priory Road, Kew, Surrey.

APOCYNACEAE.
BERBERIDACEAE.
DIOSCOREACEAE.
IRIDACEAE.
LILIACEAE.

STILL, A. L., Roslyn, Dower Avenue, Wallington, Surrey.

LABIATAE (*Mentha*). — With E. H. Metcalfe (see above).

TAYLOR, Dr G., British Museum (Natural History), Cromwell Road, London, S.W.7.

NAIADACEAE (*Potamogeton* and *Ruppia*). — With J. E. Dandy (see above).
PAPAVERACEAE.
VERBENACEAE.

TURRILL, Dr W. B., Royal Botanic Gardens, Kew, Surrey.

CARYOPHYLLACEAE. — Dr Turrill makes the reservation that material sent for naming will, if required, be retained for the Herbarium at Kew.

COMPOSITAE (*Centaurea* and *Taraxacum*). ILLECEBRACEAE. LEGUMINOSAE (*Anthyllis*).	With E. M. Marsden-Jones (see above).

TUTIN, T. G., The Botany School, Cambridge.

CERATOPHYLLACEAE. LEMNACEAE. NAIADACEAE (*Zostera*). TYPHACEAE.	Material of *Sparganium* and *Zostera* is required, also flowering *Lemna* (in spirit). Spirit material of flowering and fruiting *Zostera* is also a great aid to identification.

VALENTINE, D. H., The Botany School, Cambridge.

CUCURBITACEAE. ROSACEAE (*Spiraea, Dryas, Fragaria, Potentilla, Agrimonia* and *Poterium*).	Living (rooted) specimens are required of *Agrimonia odorata* and *Poterium muricatum*.

WADE, A. E., Dept. of Botany, National Museum of Wales, Cardiff.

BORAGINACEAE.	Fresh material is required of the following :—*Symphytum tuberosum, Mertensia maritima, Echium plantagineum, Myosotis brevifolia* and *M. sicula*.

WARBURG, Dr E. F., 4 Brookside, Cambridge.

CISTACEAE. CUPULIFERAE. GERANIACEAE. MYRICACEAE. ROSACEAE (*Prunus, Pyrus* to *Cotoneaster*).	In collecting *Erodium* the following points should be noted :—Flower-colour; whether petals are spotted or not, and whether equal or unequal : colour of anthers : colour of stigmas. In collecting *Betula* it is important to collect from several trees from the same locality, as considerable variation occurs and not enough is known of the genus at present for selecting isolated specimens to be determined. Such collections, particularly from the Midlands and north of England, would be welcomed.

WATSON, WM., 245 Southlands Road, Bickley, Kent.

ROSACEAE (*Rubus*).	Specimens should be collected from bushes growing in the open. A panicle or flowering branch about 12 inches long should be selected on which the terminal flowers have gone over but other flowers are still open and in bud. In addition one or two pieces of the non-flowering stem should be taken about three feet from the base of the stem, each piece about three inches long and bearing in the middle a single perfect leaf. The exact colour of the petals, the stamens and the styles in the unclosing flower should be observed through a lens and recorded on the label. Starved, immature or shade-grown examples should be avoided. The

ROSACEAE (*Rubus*): *Continued.* — object should be to obtain an average specimen from a strongly growing bush at the height of its flowering activity. If the drying papers are changed morning and evening for the first three days, taking care that thoroughly dry paper is used, and then once a day only, the specimens will be dried in six or seven days and the leaves and flowers will retain their natural colour. Screw pressure is essential. It gives more satisfactory results if the specimen is put straight into paper between wires or boards in the field, and is transferred to the press later in the same day.

WEISS, Prof. F. E., Easdale, Woodway, Merrow, Guildford, Surrey.

PRIMULACEAE (*Anagallis*). — With E. M. Marsden-Jones (see above).

WILMOTT, A. J., British Museum (Natural History), Cromwell Road, London, S.W.7.

AMARANTHACEAE.
CHENOPODIACEAE.
DROSERACEAE.
EMPETRACEAE.
HALORAGACEAE.
LABIATAE (*Thymus*).
POLYGALACEAE.
ROSACEAE (*Alchemilla* and *Sorbus*).
SALICACEAE (*Salix*).
SAXIFRAGACEAE.
SCROPHULARIACEAE (*Rhinanthus*).

Salicornia. Mr Wilmott would be glad to receive fresh material from parts of our coast other than between (and including) Dorset eastwards to Kent and thence north to Norfolk. Material from West and North Wales, and from any part of Ireland, is particularly wanted. Packing should be in cardboard box, not tin, and specimens separated by a sheet of newspaper to prevent "sweating." Collect when in full flower (as seeds begin to ripen), not before second half of September in normal circumstances.

WOLLEY-DOD, Lt.-Col. A. H., Berkeley Cottage, Mayfield, Sussex.

ROSACEAE (*Rosa*).