

THE BOTANICAL SOCIETY
AND EXCHANGE CLUB
OF THE BRITISH ISLES.

REPORT FOR 1935

(WITH BALANCE-SHEET FOR 1935)

BY THE

SECRETARY,

WILLIAM HARRISON PEARSALL,
GREEN GABLE, MATFIELD, KENT.

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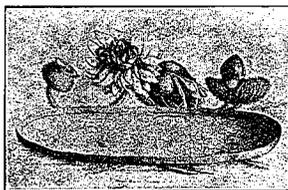
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BY THE

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THE
BOTANICAL SOCIETY & EXCHANGE CLUB
OF THE BRITISH ISLES.

REVENUE ACCOUNT FOR 1935.

Balance from Balance-Sheet for 1934, - - - £125 10 0 Subscriptions for 1935 received in 1935, - - - 185 4 0 Subscriptions paid in advance, - - - - - 19 0 0 Sales of Reports, Reprints, and Advertisements, - 20 15 0 <div style="text-align: right; border-top: 1px solid black; border-bottom: 3px double black;"> £350 9 0 </div>	Printing Reports (and cartriages, &c., connected), - £139 12 0 Expenses of Distribution, - 1 15 3 Postages and Petty Expenditure generally (Secy. and Assistant Secy.), - 20 13 0 One Year's Allowance to Secretary, - - - - - 50 0 0 Insurance, - - - - - 0 6 0 Cheque Book and Stamps, - 0 4 8 Balance, - - - - - 137 18 1 <div style="text-align: right; border-top: 1px solid black; border-bottom: 3px double black;"> £350 9 0 </div>
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PUBLICATIONS ACCOUNT.

Balance from Balance-Sheet for 1934, - - - £104 9 6 Sales of Comital Flora, - 4 14 6* Sales of British Plant Lists, 0 14 4 <div style="text-align: right; border-top: 1px solid black; border-bottom: 3px double black;"> £109 18 4 </div>	Balance, - - - - - £109 18 4 <div style="text-align: right; border-top: 1px solid black; border-bottom: 3px double black;"> £109 18 4 </div>
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*Excluding £6 for 1935, received since the Account was balanced.

BALANCE SHEET.

Balance from General A/c., £137 18 1 Balance from Publications Account, - - - - - 109 18 4 Balance from Life Members' Fund, - - - - - 116 8 0 Balance of Miss Trower's Fund, - - - - - 16 7 11 Balance of Benevolent Fund, 41 3 6 <div style="text-align: right; border-top: 1px solid black; border-bottom: 3px double black;"> £421 15 10 </div>	National Savings Certificates, at cost, - £256 16 0 National Savings Certificates, at cost, - 143 4 0 Balance in Bank, £50 1 6 Less Subs, for 1936, - - - - - 28 16 6 <div style="text-align: right; border-top: 1px solid black; border-bottom: 3px double black;"> 21 5 0 </div> Cash in Hand, - - - - - 0 10 10 <div style="text-align: right; border-top: 1px solid black; border-bottom: 3px double black;"> £421 15 10 </div>
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22nd January 1936.—Examined with the books and vouchers and found correct.

(Signed) F. A. BELLAMY, M.A., F.R.A.S.

49. Carnarvonshire. Norman Woodhead, Esq., M.Sc., University College of N. Wales, Bangor.
- 53-54. Lincolnshire. F. J. Baker, Esq., City and County Museum, Lincoln.
- 62, 65. Yorkshire, N. Riding. Miss C. M. Rob, Catton Hall, Thirsk, Yorks.
- 66-68. Northumberland and Durham. Geo. W. Temperley, Esq., 4 Selborne Avenue, Low Fell, Gateshead.
- 94-95. Moray and Banff. Rev. George Birnie, The Manse, Speymouth, Morayshire.

CORRIGENDA.

B.E.C. 1934 Rep. (1935).

- p. 825. No. 183/6e should read 195/14 *Pyrus latifolia* Syme.
No. 195/13c should be 195/9 *Pyrus intermedia* Ehrh.
- p. 826. No. *211/4 should be 211/2 *Sedum rupestre* L.
- p. 885. The paper on *Limosella* was entirely written by Lady Davy, to whom my apologies were sent. My name should obviously have been printed within the brackets.

DESIDERATA.

We shall be grateful to any member who can send a fresh and typical specimen of any of the following list—still needed—to Miss Lucy Burton, Stott Park, Lakeside, Ulverston, Lancs:—

43. *Roemeria hybrida*. 84. *Brassica adpressa*. 124. *Viola arenaria*. 130. *Dianthus Armeria*. 138. *Silene gallica*. 148. *Sagina Linnaei*. 192. *Linum angustifolium*. 251. *Trifolium maritimum*. 290. *Lathyrus hirsutus*. 311. *Rubus Chamaemorus*. 364. *Sedum dasyphyllum*. 370. *Sedum reflexum*. 380. *Saxifraga caespitosa*. 451. *Caucalis latifolia*. 489. *Valerianella carinata*. 487. *Valeriana pyrenaica*. 519. *Inula Pulicaria*. 520. *Xanthium Strumarium*. 531. *Anthemis tinctoria*. 552. *Senecio campestris*. 590. *Lactuca saligna*. 591. *Lactuca alpina*. 627. *Vaccinium uliginosum*. 665. *Pinguicula alpina*. 719. *Orobanche caryophyllacea*. 721. *Orobanche elatior*. 724. *Orobanche ramosa*. 729. *Verbascum nigrum*. 774. *Melampyrum arvense*. 794. *Nepeta Cataria*. 904. *Urtica pilulifera*. 982. *Liparis Loeselii*. 987. *Cephalanthera ensifolia*. 992. *Epipogon aphyllum*. 995. *Spiranthes Romanzoffiana*. 1008. *Habenaria intacta*. 1039. *Lloydia serotina*.

OBITUARIES.

THOMAS R. GAMBIER-PARRY; died February 15, 1935, aged 52. Elder son of Major E. Gambier-Parry of Higham Court, Gloucester, nephew of Sir Hubert Parry the composer. Educated Eton and Magdalen College, Oxford. Senior Assistant of the Bodleian Library and later Keeper of the Oriental Department. F.S.A., F.R.H.S., student of Sanscrit, authority on Heraldry, on Liturgies, on Oxford Records, on Numismatics. These are the bare facts of a singularly brave life, since united with a most brilliant brain and marvellous memory went a crippled, frail and constantly suffering body, to which handicap he ever rose superior. The study of wild flowers was to him a blessed relaxation and joy, and his botanical knowledge was wide and sound. With Dr Druce and other friends he toured the British Isles to obtain personal acquaintance with as many species as possible, and his efforts to scale the mountains for their treasures were undaunted and oftentimes pathetic. Kindly, modest, selfless, loyal and patient he possessed a quite vast number of friends of all ages, and to them he has left behind the abiding memory of "a very gallant gentleman."—G.F.

MISS IDA M. ROPER (1865-1935), who died at Bristol, June 8, 1935, was widely known for her energy as a good field botanist, and for the splendid work she did throughout thirteen years in supplying and arranging wild plants for the Bristol Museum. She had given great help to the late J. W. White in "literary research and in revision and correction for the press" of his *Flora of Bristol*, 1912. And her work as Hon. Secretary and Librarian of the Bristol Naturalists' Society, of which she was President for three years, was very great. Her specimens were well selected and carefully dried, and her large herbarium is now much appreciated at the University of Leeds. She had long been a valued contributor to both the Botanical Exchange Clubs. The study of Plant Galls was also one of her activities.

But Miss Roper for many years also found time to do some very useful work in regard to monumental effigies, and in 1930 was published her handsome work on "Monumental Effigies of Gloucestershire and Bristol."—H.S.T.

EDGAR THURSTON, C.I.E., died suddenly at Penzance on the 5th of October 1935, at the age of 80. In 1885 he was appointed Superintendent of the Government Museum, Madras, a position he held for many years. He was an authority on the ethnography and anthropology of Southern India.

After his retirement, Thurston lived chiefly in Cornwall and devoted most of his time to a study of the flora of the county. In 1922 he published a Supplement to F. Hamilton-Davey's "Flora of Cornwall" (*Journ.*

Roy. Inst. Cornwall, xxi). This was followed by seven papers (1923-29) on the Cornish flora, all but the last in collaboration with Dr C. C. Vigurs. In 1930 he published an interesting book under the title "British and Foreign Trees and Shrubs in Cornwall."

In March 1919, Thurston presented his valuable Cornish Herbarium to the Royal Botanic Gardens, Kew. To it he added large numbers of new specimens from year to year, making it a relatively complete county herbarium.

By the death of Edgar Thurston British botany has lost an enthusiastic worker, Kew a generous donor, and many of us a valued friend, who, with an ever-youthful outlook on life, carried good cheer as a gift to all with whom he came into contact.—W.B.T.

PLANT RECORDS.

*=New vice-county record.

†=Not native in this locality.

Black letter=An addition to Druce's List of British Plants.

†1/2. *CLEMATIS FLAMMULA* L. Avonmouth Docks, West Gloucester, v.-c. 34, October 1934, H. J. GIBBONS.

2/2. *THALICTRUM MINUS* L. Plumpton, E. Sussex, v.-c. 14. Complete specimens of this, previously reported in B.E.C. 1932 Report, 87 (1933), have been now submitted to Dr Butcher for critical examination and he has determined them as *T. collinum* Wallroth, L. A. W. BURDER.

*6/4. *RANUNCULUS AURICOMUS* L. Rona, Raasay and Scalpay Islands, North Ebudes, v.-c. 104, Prof. J. W. HESLOP HARRISON.

6/7b. *RANUNCULUS FLAMMULA* L., var. *ANGUSTIFOLIUS* Wallr. Sedburgh, N.W. Yorks, v.-c. 65, Mrs GRACE CORY.

6/7h. *RANUNCULUS SCOTICUS* E.S.M. The range of this species in Ireland is still incompletely worked out, but it is now recorded from 11 v.-cs., from Londonderry to Wicklow, R. L. PRÄGER.

6/13. *RANUNCULUS PARVIFLORUS* L. Common as a weed in the garden of Bassett Down House, near Wroughton, N. Wilts, v.-c. 7, T. R. G. MOIR.

6/22. *RANUNCULUS TRICHOPHYLLUS* Chaix. Near East Meon, S. Hants, v.-c. 11, P. M. HALL, N. D. SIMPSON, and E. C. WALLACE.

6/24c. *RANUNCULUS HETEROPHYLLUS*, var. *SUBMERSUS* Bab. Stream running into Dunnet Bay, Caithness, v.-c. 109, Mrs G. FOGGITT. Det. W.H.P.

6/26. *RANUNCULUS PSEUDO-ELUTANS* B. & F. R. Teif, below Tregaron, Cardigan, v.-c. 46, P. M. HALL and Dr SLEDGE. Det. W.H.P.

7/1c. *CALTHA PALUSTRIS* L., var. *GUERANGERII* (BOR.). Between Selham and S. Ambersham, W. Sussex, v.-c. 13, P. M. HALL and E. C. WALLACE.

9/2. *HELLEBORUS FOETIDUS* L. Near West Malling, E. Kent, v.-c. 15, Miss L. ABELL; Wood at Castle Frome, Herefordshire, v.-c. 36, F. M. DAY.

11/1. *AQUILEGIA VULGARIS* L. Guiting, E. Gloster, v.-c. 33, Miss L. ABELL.

20(2)/1. *Sarracenia purpurea* L. A few plants introduced in Co. Roscommon in 1926 have now increased to many thousands, R. L. PRAEGER, 1935.

21/4. *PAPAVER LEOCQII* Lamotte. Railway bank between Tonbridge and Hildenborough, W. Kent, v.-c. 16, J. P. M. BRENNAN.

†30/3. *DICENTRA EXIMIA* TOTT. One patch spreading in a wood below the High Rocks, W. Kent, v.-c. 16, 1933-34, J. P. M. BRENNAN.

32/5. *FUMARIA BORAEI* Jord. La Corbière, Jersey, Mrs MACALISTER HALL; Rocquaine Bay, Jersey, H. PHILLIPS. Det. H. W. PUGSLEY.

*32/6. *FUMARIA MURALIS* Sond. Hope, near Salcombe, S. Devon, v.-c. 3, H. W. PUGSLEY.

*32/8. *FUMARIA MARTINII* Clav. Allotment, Salcombe, S. Devon, v.-c. 3, H. W. PUGSLEY.

32/13c. *FUMARIA PARVIFLORA* Lam., var. *SYMEI* Pugsley. Cherry Hinton, Cambs, v.-c. 29, H. PHILLIPS. Det. H. W. PUGSLEY. Add "S" to *Comital Flora* but not N.C.R.

†33/4. *MATTHIOLA BICORNIS* DC. Sand-dunes near Burnham, N. Somerset, v.-c. 6, J. P. M. BRENNAN.

36/3e. *BARBAREA VULGARIS* R. Br., var. *silvestris* Fries. West Cove, Co. Kerry, det. C. E. BRITTON, J. CHAPPLE.

†36/5. *BARBAREA INTERMEDIA* Boreau. Tonbridge, W. Kent, v.-c. 16; yard near Cheddar Station, N. Somerset, v.-c. 6, J. P. M. BRENNAN.

*37/2b. *ARABIS BROWNII* Jord., var. *HISPIDA* Syme. E. of Foynes, Limerick, v.-c. H. 8, N. D. SIMPSON.

*44/3. *EROPHILA PRÆCOX* (Stev.) DC. Stoborough Heath, Dorset, v.-c. 9, N. D. SIMPSON.

49/6b. *SISYMBRIUM OFFICINALE* (L.) Scop., var. *LEIOCARPUM* DC. Avon Bank N. of the Aqueduct, near Monkton Combe, N. Wilts, v.-c. 7; two spots at Tonbridge, W. Kent, v.-c. 16, J. P. M. BRENNAN.

†51/1. *ERYSIMUM ORIENTALE* R. Br. Cornfield between Tilford and Frensham, Surrey, J. G. LAWN.

†61/3. *LEPIDIUM DRABA* L. Recently found in *Kintyre, v.-c. 101, L. McINNES; also on railway bank, New Swindon, *N. Wilts, v.-c. 7, I DONALD GROSE.

*61/5. *LEPIDIUM CAMPESTRE* Br. Wayside, Minto, Roxburgh, v.-c. 80, Miss P. LEAKE.

†61/8. *LEPIDIUM PERFOLIATUM* L. Waste ground, Ipswich docks, v.-c. 25, Miss E. RAWLINS.

†61/24. *LEPIDIUM NEGLECTUM* Thell. Sandy roadside between Hythe and Dymchurch, E. Kent, v.-c. 15, J. P. M. BRENNAN.

64/3. *THLASPI ALPESTRE* L. A few plants seen in Caenlochan Glen, Angus, v.-c. 90, July 1935, E. C. WALLACE.

*66/1. *TEESDALIA NUDICAULIS* (L.) Br. One plant only, Kintyre, v.-c. 101, L. McINNES.

†71(2)/1. *Succowia balearica* Medik. Garden casual, Bristol, W. Gloucester, v.-c. 34, May 1935. Distribution, Western Mediterranean region, H. J. GIBBONS.

†79/1. *ERUCARIA HISPANICA* (L.) Dr. Avonmouth Docks, W. Gloster, v.-c. 34, Mrs SANDWITH and J. P. M. BRENNAN.

†84/1. *GYNANDROPSIS GYNANDRA* (L.) Briquet (*G. PENTAPHYLLA* DC.). Ashton Gate, Bristol, Somerset, v.-c. 6, September 1935, C. I. SANDWITH and J. P. M. BRENNAN.

88/3. *VIOLA SILVESTRIS* Lam. An unusual form was received from Miss Miller from Churchill, N. Somerset, v.-c. 6; this had the lower petal pale with the usual purple patch replaced by white; possibly the var. *lilacina* Celak, P. M. HALL.

88/4. *VIOLA RIVINIANA* Reichb., f. *ROSEA*. Netton Cleave, S. Devon, v.-c. 3, G. T. FRASER, comm. P. M. HALL; Brighstone Down, Isle of Wight, v.-c. 10, P. M. HALL.

88/6×4. *VIOLA CANINA* L. × *RIVINIANA* Reichb. Barton Mills, W. Suffolk, v.-c. 26, J. CHAPPLE. Det. P. M. HALL.

88/6b. *VIOLA CANINA* L., var. *ERICETORUM* Reichb. Jevington, E. Sussex, v.-c. 14, RICHARDS, comm. A. H. WOLLEY-DOD.

88/7. *VIOLA LACTEA* Sm. Wickham Common and Hayling Island, S. Hants, v.-c. 11, P. M. HALL; Jevington, E. Sussex, v.-c. 14, RICHARDS, comm. A. H. WOLLEY-DOD.

88/9×8. *VIOLA HIRTA* L. × *ODORATA* L. Castle Frome, Herefordshire, v.-c. 36, F. M. DAY; Utterby, N. Lincs, v.-c. 54, Miss C. B. MARSDEN. Det. P. M. HALL.

*88/14. *VIOLA CONTEMPTA* Jord. Kingsteington, S. Devon, v.-c. 3, G. T. FRASER and Dr T. STEPHENSON.

Note.—All these pansies have been passed by Mrs Drabble and myself and we are agreed on them. I have kept back 2 or 3 records on which we do not quite agree.—P.M.H.

88/19. *VIOLA LEJEUNEI* Jord. Hennock, S. Devon, v.-c. 3, G. T. FRASER, comm. P. M. HALL.

88/22. *VIOLA AGRESTIS* Jord. *Upper Welland, near Malvern, Worcestershire, v.-c. 37, F. M. DAY; Mathon, Herefordshire, v.-c. 36, F. M. DAY.

88/23. *VIOLA SEGETALIS* Jord. Hennock, S. Devon, v.-c. 3, G. T. FRASER, comm. P. M. HALL.

88/24. *VIOLA OBTUSIFOLIA* Jord. Near Goring, Oxfordshire, v.-c. 23, P. M. HALL and N. D. SIMPSON; allotments, Kenfig, Glamorganshire, v.-c. 41, P. M. HALL and W. A. SLEDGE; Hennock, S. Devon, v.-c. 3, G. T. FRASER, comm. P. M. HALL; Broadsands, S. Devon, v.-c. 3, Dr T. STEPHENSON; Exmouth, S. Devon, v.-c. 3, Dr T. STEPHENSON.

88/26. *VIOLA RURALIS* Boreau. Rocquaine Bay, Guernsey, det. Mrs E. DRABBLE, who says that the late Dr E. Drabble had a record from "Jersey," but this is the first record from Guernsey, and "S" needs to be added to the *Com. Fl.*, H. PHILLIPS; Upham, S. Hants, v.-c. 11, P. M. HALL; Firle, E. Sussex, v.-c. 14, P. M. HALL and A. H. WOLLEY-DOD; Kingsley, N. Hants, v.-c. 12, P. M. HALL, N. D. SIMPSON, and E. C. WALLACE; *Sharkham Point, Brixham, S. Devon, v.-c. 3, G. T. FRASER and Rev. T. STEPHENSON, comm. P. M. HALL.

88/27. *VIOLA ANGLICA* Drabble. *Near Rake, W. Sussex, v.-c. 13, P. M. HALL, N. D. SIMPSON, and E. C. WALLACE; Fleam Dyke, Cambridgeshire, v.-c. 29, H. PHILLIPS; Netton Cleave, S. Devon, v.-c. 3, G. T. FRASER, comm. P. M. HALL.

*88/28. *VIOLA DESEGLISEI* Jord. Hennock, S. Devon, v.-c. 3, G. T. FRASER, comm. P. M. HALL.

88/33. *VIOLA LUTEA* Huds. Minto Hills, Roxburgh, v.-c. 80, Miss P. LEAKE.

89/1b. *POLYGALA SERPYLLIFOLIUM* Hose, var. *VINCOIDES* (Chodat) Dr. Pickwell Down, N. Devon, v.-c. 4, Dr F. R. E. WRIGHT.

89/5×2. *POLYGALA CALCAREUM* F. Sch. × *VULGARE* L. Worth, Dorset, v.-c. 9. Removes ? from *Br. Pl. List*, N. D. SIMPSON.

96/3. *SILENE CONICA* L. On Hartlebury Common, Worcester, v.-c. 37 (removes brackets in *Com. Fl.*), 35 plants were counted, R. C. BURGESS.

100/2. *CERASTIUM ARVENSE* L. Roadside, Bagendon, E. Gloster, v.-c. 33, C. T. AMHERST. Add to *Comital Flora*, but not N.C.R. See *Top. Bot.*

100/4. *CERASTIUM ARCTICUM* Lange. Slochd Mhor, Ben Avon, Banff, v.-c. 94, E. C. WALLACE.

100/6c. *CERASTIUM VISCOSUM* L., var. *COROLLINUM* Fenzl, sub.-var. *ELONGATUM* Rouy. Banks of R. Ogmore, Merthyr Mawr, Glamorgan, v.-c. 41, E. VACHELL.

105/4×3. *SPERGULARIA BOCCONEI* (Soleir.) Steudel × *S. SALINA* Presl. A single plant gathered at Par Harbour, E. Cornwall, with both presumed parents appeared to belong to this hitherto unrecorded hybrid, J. E. LOUSLEY. Mr Lousley says that a plant collected by Lady Davy in Jersey in 1935 is identical with the specimen he gathered at Par, Cornwall (see *Journ. Bot.*, 1934, 257), except that the flowers are more congested.

†107/1. *PORTULACA OLERACEA* L. Forest Row, E. Sussex, v.-c. 14, established as a garden weed for several years, Miss M. PARSONS.

†108/1. *CLAYTONIA SIBIRICA* L. Recently introduced and spreading, Waggoner's Wells, N. Hants, v.-c. 12, P. M. HALL and Lt.-Col. G. WATTS.

†108/2. *CLAYTONIA PERFOLIATA* Donn. Barry Island, Glamorgan, v.-c. 41, MILES THOMAS per E. VACHELL; *sandy arable field, Rake, W. Sussex, v.-c. 13, P. M. HALL, N. D. SIMPSON, and E. C. WALLACE.

109/2c. *MONTIA CHONDROSPERMA* Fenzl, var. *RIVULARIS* Gmel. Ty Mawr, Cárdirganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE.

*111/1. *ELATINE HYDROPIPER* L. Amberley Wild Brooks, W. Sussex, v.-c. 13, B. T. LOWNE, comm. A. H. WOLLEY-DOD.

†115/2. *ALTHAEA HIRSUTA* L. Broughton Wood. N. Lincs., v.-c. 54, F. T. BAKER.

†116/8. *LAVATERA TRIMESTRIS* L. Broughton Wood, N. Lincs., v.-c. 54, F. T. BAKER.

†118/3. *Sida rhombifolia* L. Olympia sidings, Selby, S.E. Yorks, v.-c. 61, W. A. SLEDGE. Det. KEW.

†120/1. *ABUTILON THEOPHRASTI* Med. Dagenham, S. Essex, v.-c. 18, J. P. M. BRENNAN.

*127/11. *GERANIUM ROTUNDIFOLIUM* L. Broughton, S. Hants, v.-c. 11, Miss SALMON, comm. P. M. HALL.

128/3d. *ERODIUM CICUTARIUM* L'Hérit., var. *LEBELII* (Jord.). Llyn Coron, Anglesey, v.-c. 52; Raven Point, Wexford, v.-c. H. 12, N. D. SIMPSON.

128/3e. *ERODIUM CIGUTARIUM* L'Hérit., var. *NEGLECTUM* (B. f. & S.). Christchurch, S. Hants, v.-c. 11, N. D. SIMPSON; sandy ground by the sea just S. of Dymchurch, E. Kent, v.-c. 15, J. P. M. BRENNAN.

+132/5. *OXALIS CORYMBOSA* DC. L'Ancrese Common, Guernsey, H. PHILLIPS.

+133/3. *IMPATIENS PARVIFLORA* DC. In four places at Tonbridge, W. Kent, v.-c. 16, J. P. M. BRENNAN.

+135(2)/1. *Allanthurus altissima* (Mill.) Swingle. A young plant or two on the river-wall by the Thames between Kew and Mortlake, v.-c. 17, R. N. PARKER and J. P. M. BRENNAN.

+140/1. *VITIS VINIFERA* L. Scattered along the river-wall between Kew and Mortlake, and climbing over willows, Surrey, v.-c. 17. The leaves of this species are very variable in their form and clothing. In this station all the plants had the leaves very deeply 5-lobed, the lobes overlapping at the top and coarsely lobate and dentate, but with deep open U-shaped sinuses between. The leaves were quite glabrous, except for some very slight floccosity and very short hairs on the primary nerves beneath, and at the point of their convergence at the base of the lamina, R. N. PARKER and J. P. M. BRENNAN.

+*154/4. *MELILOTUS INDICA* (L.) All. (*PARVIFLORA* Desf.). Shoreham, W. Sussex, v.-c. 13, a small quantity in one spot, L. A. W. BURDER.

+155/6. *TRIFOLIUM STELLATUM* L. Shoreham, W. Sussex, v.-c. 13. The result of an attempt to increase its distribution artificially by means of garden-raised seed has been carefully watched for some years, but it appears to be quite abortive, L. A. W. BURDER.

*155/9. *TRIFOLIUM BOCCONEI* Savi. Jersey, specimen sent to Secretary, Lady DAVY. New to Channel Islands.

*155/18. *TRIFOLIUM SUFFOCATUM* L. Icklingham, W. Suffolk, v.-c. 26, Lady DAVY.

+155/32. *TRIFOLIUM CONSTANTINOPOLITANUM* Sér. Tip, Bristol, West Gloucester, v.-c. 34, June 1935, C. I. and N. Y. SANDWICH.

160/8. *LOTUS ANGUSTISSIMUS* L. Near Wonersh, Surrey, v.-c. 17, H. W. PUGSLEY, Lt.-Col. G. WATTS and A. L. STILL.

+170/1. *CORONILLA VARIA* L. Grassy bank outside Woolwich Arsenal towards Erith, in plenty, September 1933, W. Kent, v.-c. 16, J. P. M. BRENNAN.

176/4. *VICIA OROBUS* DC. Very abundant about Ty Mawr, Cardiganshire, v.-c. 46, even persistent as a weed of arable land, P. M.

HALL and W. A. SLEDGE; rocky path below Cader Idris, Merioneth, v.-c. 48, Hon. Mr JUSTICE TALBOT.

†176/5. *VICIA VILLOSA* Roth. Wyberton and Foss-bank, Lincoln, v.-c. 53, S. J. HURST and F. T. BAKER.

176/14. *VICIA LATHYROIDES* L. Sandy arable field near Rake, W. Sussex, v.-c. 13. An inland locality in the extreme north-west corner of the county, P. M. HALL, N. D. SIMPSON, and E. C. WALLACE.

†176/25. *VICIA NARBONENSIS* L. Broughton Wood, N. Lincs, v.-c. 54, F. T. BAKER.

†176/28. *VICIA GRANDIFLORA* Scop. Casual, Avonmouth Docks, West Gloucester, v.-c. 34, October 1934, H. J. GIBBONS.

†*178/7. *LATHYRUS HIRSUTUS* L. Wyberton, S. Lincs, v.-c. 53, S. J. HURST.

†178/18. *LATHYRUS CICERA* L. Railway-side between the Quenvais race-course and Blanchés Banques station, Jersey, Mrs MACALISTER HALL.

183/4 *PRUNUS CERASUS* L. Near Marlborough, N. Wilts, v.-c. 7, J. D. GROSE and P. M. HALL; Pyecombe, Sussex, v.cs. 13 and 14, P. M. HALL.

*185/34. *RUBUS CHLOROTHYRSUS* Focke. Maam Bridge, W. Galway, v.-c. H. 16, new to Ireland, N. D. SIMPSON.

185/36b. *RUBUS ATROCAULIS* P.J.M., var. *CALVATUS* (Blox.). South Haven, Dorset, v.-c. 9, A. H. EVANS and N. D. SIMPSON.

185/38×47. *Rubus laciniatus* Willd. × *ulmifolius* Schott. Salcombe, S. Devon, v.-c. 3, addition to *Br. Pl. List*, N. D. SIMPSON.

185/45. *RUBUS WINTERI* P.J.M. Wareham to Bere Road, Dorset, v.-c. 9, A. H. EVANS and N. D. SIMPSON.

185/49(2). *RUBUS CURVISPINUS* W. Wats. Between Highcliff and Milton, S. Hants, v.-c. 11, A. H. EVANS and N. D. SIMPSON.

*185/84. *RUBUS APICULATUS* W. & N. Lough Corrib, between Cong and Headford, East Mayo, v.-c. H. 26, N. D. SIMPSON.

185/84e. *RUBUS ANGLOSAXONICUS* Gel., sub-sp. *SETULOSUS* Rogers. In shade, Cranham, E. Gloster, v.-c. 33; near Tintern, Monmouth, v.-c. 35, J. CHAPPLE. Det. H. J. RIDDELSDELL.

185/95. *RUBUS CENOMANENSIS* Sudre, var. *NEWBOULDI* Rogers. Bangor, Caernarvon, v.-c. 49, N. D. SIMPSON.

185/104. *RUBUS LEJEUNEI* W. & N., var. *CUNEATUS* (Rog. & Ley). South Haven, Dorset, v.-c. 9, A. H. EVANS and N. D. SIMPSON.

185/110c. *RUBUS FUSCUS* W. & N., var. *HYPOSERICICEUS* Sudre. Bangor, Caernarvon, v.-c. 49, N. D. SIMPSON.

185/122c. *RUBUS ROSACEUS* W. & N., var. *SCABRIPES* (Génév.) Sudre. Breamore Wood, S. Hants, v.-c. 11, A. H. EVANS and N. D. SIMPSON; *Glengarriff, West Cork, v.-c. H. 3, N. D. SIMPSON.

†185/159. *RUBUS PHOENICOLASIUS* Maxim. Worthing, W. Sussex, v.-c. 13, an alien *Rubus* (Japan) growing about two feet in height, L. A. W. BURDEE.

†189/11. *POTENTILLA NORVEGICA* L. Near Twerton Wood House, Bath, N. Somerset, v.-c. 6; railway bank, Cuxton, W. Kent, v.-c. 16, J. P. M. BREANAN; *Weymouth railway yards, Dorset, v.-c. 9, N. D. SIMPSON.

190/9. *ALCHEMILLA ACUTIDENS* Buser. Rocks, High Cup Nick, Westmorland, v.-c. 69, July 1934, A. H. G. ALSTON, C. I. and N. Y. SANDWITH; rock ledge on Ingleborough, M.W. Yorks, v.-c. 64, June 1935 (also seen in Herb. Sledge as *A. fissa* Buser, det. Jaquet), A. J. WILMOTT.

191/2. *AGRIMONIA ODORATA* (Gouan) Mill. Milland, W. Sussex, v.-c. 13, P. M. HALL.

†*195/9. *SORBUS INTERMEDIA* (Ehrh.) Pers. Several trees, appearing perfectly native, on a limestone scar near Austwick, M.W. Yorks, v.-c. 64, July 1934. Since recorded from another locality near Stainforth, C. I. and N. Y. SANDWITH.

†195/14. *SORBUS LATIFOLIA* Pers. A form of this species resembling the Burgh Heath, Surrey tree is planted in copse near Riplington, West Meon, S. Hants, v.-c. 11, P. M. HALL and E. C. WALLACE

196/2b. *CRATAEGUS OXYACANTHOIDES* Thuill., var. *ERIOCALYX* (Freyn) Dr. Shipbourne Common, W. Kent, v.-c. 16, J. P. M. BREANAN.

†*197/3. *COTONEASTER SIMONSII* Baker. One small plant at Oldbury Camp, near Igham, W. Kent, v.-c. 16, J. P. M. BREANAN.

199/24(2). *Saxifraga spathularis* Brot. (*S. UMBROSA* auct.). The known range of this species has been extended by the discovery of two stations in Wicklow, R. L. PRAEGER.

†200/1. *TELLIMA GRANDIFLORA* R. Br. Appeared for the first time in uncultivated ground near Ripley Castle, Harrogate, M.W. Yorks, Lady A. D. INGILBY. Det. KEW.

203/1. *CHRYSOSPLENIUM ALTERNIFOLIUM* L. Near Ampfield, S. Hants, v.-c. 11, H. T. WHITE, very rare in Hampshire and only the second recorded station in S. Hants, comm. P. M. HALL; between Selham and S. Ambersham, W. Sussex, v.-c. 13, confirmation of the locality from which it was first recorded for the vice-county in 1911, P. M. HALL and E. C. WALLACE.

*217/5. *CALLITRICHE INTERMEDIA* Hoffm. The Mares, Braunton, N. Devon, v.-c. 4, W. H. PEARSALL and Dr F. R. E. WRIGHT.

EPILOBIUM all named by G. M. ASH.

220/4. *EPILOBIUM PARVIFLORUM* Schreber. Waggoner's Wells, N. Hants, v.-c. 12, P. M. HALL.

*220/6. *EPILOBIUM LAMYI* F. Sch. Near Cardiff, Glamorgan, v.-c. 41. Mr G. M. Ash refers this plant to f. *minor*, E. VACHELL.

220/7. *EPILOBIUM OBSCURUM* Schreber. South Haven Peninsula, Dorset, v.-c. 9, P. M. HALL; Waggoner's Wells, N. Hants, v.-c. 12, P. M. HALL.

220/7(2). *EPILOBIUM ADENOCAULON* Hausskn. *Petersfield Heath Pond, S. Hants, v.-c. 11, R. W. BUTCHER and P. M. HALL; Waggoner's Wells, N. Hants, v.-c. 12, R. W. BUTCHER and P. M. HALL; Amberley Wild Brooks, W. Sussex, v.-c. 13, G. M. ASH and P. M. HALL.

220/7(2)×7. *EPILOBIUM ADENOCAULON* Hausskn. × *OBSCURUM* Schreb. Roadside ditch, Torrington, N. Devon, v.-c. 4, September 1935, sp. in Hb. Druce, J. CHAPPLE, Lady DAVY, and Miss C. ROB. Although *E. adenocaulon* has not been recorded from Devon—and nowhere nearer than W. Gloster in 1920—G. M. Ash is confident that the above name is correct. It awaits to be seen if *adenocaulon* can be found in N. Devon; Waggoner's Wells, N. Hants, v.-c. 12, P. M. HALL.

220/9. *EPILOBIUM LANCEOLATUM* Seb. & Maur. Hillside above Wotton-under-Edge, towards North Nibley, W. Gloster, v.-c. 34; top of River Hill near Sevenoaks, W. Kent, v.-c. 16, J. P. M. BRENNAN.

220/10. *EPILOBIUM MONTANUM* L. Garden weed, Fareham, S. Hants, v.-c. 11, P. M. HALL; Waggoner's Wells, N. Hants, v.-c. 12, P. M. HALL.

220/10×4. *EPILOBIUM MONTANUM* L. × *PARVIFLORUM* Schreb. Lambridge Wood, Henley, Oxon, v.-c. 23, G. M. ASH with J. CHAPPLE.

220/10×7. *EPILOBIUM MONTANUM* L. × *OBSCURUM* Schreb. Waggoner's Wells, N. Hants, v.-c. 12, P. M. HALL.

220/10×8. *EPILOBIUM MONTANUM* L. × *ROSEUM* Schreb. Garden weed, Fareham, S. Hants, v.-c. 11, P. M. HALL.

+223/4. *OENOTHERA MURICATA* L. Waste-field, Henley-on-Thames, Oxon, v.-c. 23, J. CHAPPLE. Det. C. E. BRITTON.

+230/1. *CITRULLUS VULGARIS* L. Waste ground, Ashton Gate, Bristol, North Somerset, v.-c. 6, 1934, C. I. and N. Y. SANDWICH.

+244/2. *Smyrniium perfoliatum* Mill. Burton's Court, Chelsea, London. First noticed in 1932, and has well maintained itself ever since, Hon. Mr JUSTICE TALBOT.

247/6. *APTUM MOOREI* Dr. Has proved to be well distributed in Ireland, having been recorded from 16 v.-cs., R. L. PRAEGER.

+250/6. *CARUM AROMATICUM* (L.) Druce. (*C. COPTICUM* Bth. & Hk.). Avonmouth Docks, West Gloucester, v.-c. 34, September 1935, C. I. SANDWICH and H. J. GIBBONS.

*255/1. *PIMPINELLA MAJOR* Huds. South Cadbury, S. Somerset, v.-c. 5. This plant was seen and sketched in 1903 by A. L. STILL. Again seen and collected in 1935, A. L. STILL and N. D. SIMPSON.

255/1b. *PIMPINELLA MAJOR* Huds., var. *DISSECTA* Dr. Brockhampton, E. Gloster, v.-c. 33, Miss L. ABELL.

266/1. *AETHUSA CYNAPIUM* L., b. *AGRESTIS* Wallr. St Fagans, Glamorgan, v.-c. 41, E. VACHELL.

277/2. *HERACLEUM SPHONDYLIIUM* L., var. *ANGUSTIFOLIUM* Huds. Sapperton, E. Gloucester, v.-c. 33, E. C. WALLACE.

+279/1. *CORIANDRUM SATIVUM* L. Dagenham, S. Essex, v.-c. 18, J. P. M. BRENNAN; Weymouth, Dorset, v.-c. 9, N. D. SIMPSON.

+282/6. *ORLAYA GRANDIFLORA* (L.) Scop. Casual at Wapping Wharf, Bristol Harbour, W. Gloucester, v.-c. 34, July 1935, H. J. GIBBONS.

+283/8. *TURGENIA LATIFOLIA* (L.) Hoffm. Wapping Wharf, Bristol Harbour, West Gloucester, v.-c. 34, June 1935, H. J. GIBBONS.

+287/1. *SAMBUCUS RACEMOSA* L. Woodland near Shipbourne and Southborough, W. Kent, v.-c. 16, J. P. M. BRENNAN.

287/2b. *SAMBUCUS NIGRA* L., var. *LACINIATA* L. Seaford, E. Sussex, v.-c. 14, one bush among others of normal type, L. A. W. BURDER.

+292/1. *LEYCESTERIA FORMOSA* Wallich. An escape becoming naturalised in a willow patch at Fishguard, Pembrokeshire, v.-c. 45, N. D. SIMPSON.

+294(2)/1. *Borreria verticillata* L. Olympia sidings, Selby, S.E. Yorks, v.-c. 61, W. A. SLEDGE. Det. KEW.

*296/5. *GALIUM PUMILUM* Murray. In chalk pasture on the downs above Folkestone, East Kent, v.-c. 15, June 1935, E. MILNE-REDHEAD, N. Y. SANDWITH, and V. S. SUMMERHAYES.

*296/13. *GALIUM ANGLICUM* Hudson. Old Basing, near Basingstoke, N. Hants, v.-c. 12, Mrs LANG and Miss WEBSTER. Det. W.H.P.

†301/4. *VALERIANA PYRENAICA* L. Brentor, near Dartmoor, S. Devon, v.-c. 3, Miss P. M. PEARSALL.

*304/2. *VALERIANELLA ERIOCARPA* Desv. Limestone pasture above Cheddar, N. Somerset, v.-c. 6, June 30th, 1935, C. I. and N. Y. SANDWITH and H. W. PUGSLEY; *near Northleach, E. Gloucester, v.-c. 33, E. VACHELL.

304/3b. *VALERIANELLA DENTATA* (L.) Poll., var. *MIXTA* (L.). Elsfield, Oxon, v.-c. 23, J. CHAPPLE.

304/4. *VALERIANELLA CARINATA* Loisel. Shingle beach at Kingsdown, E. Kent, v.-c. 15, J. P. M. BRENNAN.

306/2. *DIPSACUS PILOSUS* L. Glenham, E. Suffolk, v.-c. 25, Miss L. ABELL.

†308/2b. *SCABIOSA MARITIMA* L., var. *ATROPURPUREA* L. Abundant on a railway bank at Dumpton, E. Kent, v.-c. 15, Dr A. R. M. BRENNAN.

†319/2. *Aster (Felicja) petiolatus* Harv. A native of S. Africa. Well established in a wild state beside the Thames at Abingdon, Berks, v.-c. 22, growing between the stones of the wall forming the Berkshire bank of the river, S. ALLEN WARNER. Det. Kew.

*333/5. *INULA CRITHMOIDES* L. Grain, West Kent, v.-c. 16, E. C. WALLACE.

†333/8. *INULA GRAVEOLENS* L. Waste ground, Ashton Gate, Bristol, v.-c. 6, November 1934, C. I. SANDWITH.

†341(2)/1. *SIEGESBECKIA ORIENTALIS* L. Poultry run near Fleet, N. Hants, v.-c. 12, G. WATTS; Olympia sidings, Selby, S.E. Yorks, v.-c. 61, W. A. SLEDGE. See *Rep. B.E.C.*, 617, 1928, and 130, 1932, for previous record.

†345/1. *RUDBECKIA LACINIATA* L. Sand-pit by the road between Stone Street and Ivy Hatch, near Wrotham, W. Kent, v.-c. 16, J. P. M. BRENNAN.

353/1b. *BIDENS CERNUA* L., var. *RADIATA* DC. Renvyle, W. Galway, v.-c. H. 16, N. D. SIMPSON.

†356/4. *HEMIZONIA FITCHII* A. Gray. Railway bank, Bristol, W. Gloucester, v.-c. 34, October 1934, C. I. SANDWICH.

†*383/7. *SENECIO SQUALIDUS* L. Broughton Wood, N. Lincs, v.-c. 54, F. T. BAKER.

†*383/7d. *SENECIO SQUALIDUS* L., var. *LEIOCARPUS* Dr. Waste ground, Bath, N. Somerset, v.-c. 6, J. P. M. BRENNAN.

383/10e. *SENECIO VULGARIS* L., var. *RADIATUS* Koch. Near Chester, Cheshire, v.-c. 58, and apparently spreading, Hon. JUSTICE TALBOT.

†383/26. *SENECIO SMITHII* DC. Appeared some years ago at the S. end of Kintyre, v.-c. 101, where it still survives. This year found 20 miles further north, L. McINNES.

†383/31. *SENECIO CINERARIA* DC. Shingle beach at Kingsdown, E. Kent, v.-c. 15; roadside near Widemouth, E. Cornwall, v.-c. 2, J. P. M. BRENNAN.

†395/8. *CARDUUS LEIOPHYLLUS* Petrov. A native of the Balkan States which may be distinguished from the rather similar *C. macrophyllus* Desf. by the glabrous leaves and the phyllaries which terminate in a shorter mucro. Waste-heap, Welwyn, Herts, 1934, H. PHILLIPS.

396/4×2. *Cirsium acaule* (L.) Weber × *lanceolatum* Scop. Pasture near Marshfield, W. Gloster, v.-c. 34, J. P. M. BRENNAN.

396/4×6. *CIRSIIUM ACAULE* (L.) Weber × *TUBEROSUM* = *FRASERIANUM* Dr. Monknash, Glamorgan, v.-c. 41, new to this county. *C. acaule* (L.) Weber and *C. tuberosum* L. both grew near. A good range of hybrids could be traced. The best clumps grew massed together like *C. acaule*. They have the roots, smoother stems and bright colouring of *C. acaule* and the large leaves, globular heads, darker colouring and height of *C. tuberosum*, G. L. BRUCE per E. VACHELL.

396/5. *CIRSIIUM PRATENSE* (Huds.) DC. Very sparingly at Ty Mawt, Cardiganshire, v.-c. 46, rare in the county, P. M. HALL and W. A. SLEDGE.

†399/1. *SILYBUM MARIANUM* Gaertn. Ballast heap in Tonbridge goods-yard, W. Kent, v.-c. 16, J. P. M. BRENNAN. Add to *Comital Flora*.

402/1c. *SERRATULA TINCTORIA* L., var. *INTEGRIFOLIA* Koch. Avebury Camp, N. Wilts, v.-c. 7, J. P. M. BRENNAN.

405/11. *CENTAUREA NEMORALIS* Jord. *Rievaulx, N.E. Yorks, v.-c. 62, H. PHILLIPS; *Killean, Kintyre, v.-c. 101, Mrs MACALISTER HALL.

405/12. *CENTAUREA CYANUS* L. One large plant with rose-coloured rays; half mile from any house, near Sturdy's Castle, Oxon, v.-c. 23, J. CHAPPLE.

†405/14. *CENTAUREA PANICULATA* L. Avonmouth Docks, West Gloucester, v.-c. 34, October 1934, C. I. SANDWITH.

†405/32. *CENTAUREA MELITENSIS* L. Docks, Felixstowe, E. Suffolk, v.-c. 25, Miss E. RAWLINS.

†407/3. *CARTHAMUS TINCTORIUS* L. Hove, Sussex, v.-c. 14, seven plants in all, Miss PICKARD and L. A. W. BURDER.

†419/8. *HIERACIUM AURANTIACUM* L. Marston Green, Warwickshire, v.-c. 38, LESLIE T. ADAMS.

†425/9. *LACTUCA TATARICA* C.A.M. Waste ground, Felixstowe, E. Suffolk, v.-c. 25, coll. Miss J. ELDRIDGE, comm. H. N. DIXON.

†428/1. *TRAGOPOGON PORRIFOLIUS* L. Grays, S. Essex, v.-c. 18, P. H. COOKE.

†*435/8. *CAMPANULA PATULA* L. Waste ground, near docks, Ipswich, E. Suffolk, v.-c. 25, Miss E. RAWLINS.

†436/2. *LEGOUSIA SPECULUM-VENERIS* (L.) Fisch. Tip, Bristol, W. Gloucester, v.-c. 34, June 1935, C. I. and N. Y. SANDWITH.

439/1. *OXYCOCCUS QUADRIPETALUS* Gilib. At over 2500 feet, Corrie Etchachan, Ben Macdhui, S. Aberdeen, v.-c. 92, E. C. WALLACE; Crinan Moss, Kintyre, v.-c. 101, Mrs MACALISTER HALL.

440/1. *ARBUTUS UNEDO* L. Has been found unquestionably native in Sligo, 160 miles north of Killarney, which was previously the most northerly locality known, R. L. PRAEGER.

456/1. *MONOTROPA HYPOPITYS* L. Elham Valley, E. Kent, v.-c. 15, 1934; near Cirencester, E. Gloster, v.-c. 33, 1935, Miss L. ABELL.

467/1. *ANAGALLIS TENELLA* Murr. Castleward, near Douglas, Isle of Man, v.-c. 71, all flowers having six petals, W. S. COWIN.

467/2c. *ANAGALLIS ARVENSIS* L., var. *VERTICILLATA* Diard. Splott, Glamorgan, v.-c. 41, E. VACHELL.

468/1. *CENTUNCULUS MINIMUS* L. Alderbury Common, near Salisbury, S. Wilts, v.-c. 8, Miss B. GULLICK.

478/4. *CENTAURIUM PULCHELLUM* (Fr.) Hayek. Vann Lane, Chiddingfold, Surrey, v.-c. 17, A. L. STILL.

480/4×8. *GENTIANA AMARELLA* L. × *GERMANICA* Willd. (*PAMPLINII* Dr.). One plant, Chinnor, Oxon, v.-c. 23, E. C. WALLACE.

*480/9b. *GENTIANA BALTICA* Murb. Dogs Bay, Roundstone, W. Galway, v.-c. H. 16, N. D. SIMPSON.

†*486/1. *POLEMONIUM CAERULEUM* L. By the shores of Loch Tay, Kenmore, Mid-Perth, v.-c. 88, but doubtless of garden origin, J. CHAPPLE.

†494/1. *ASPERUGO PROCUMBENS* L. By a pond between Dymchurch and New Romney, E. Kent, v.-c. 15, J. P. M. BRENNAN.

†497/3. *SYMPHYTUM ORIENTALE* L. Worthing, W. Sussex, v.-c. 13, well established and in some quantity, second Sussex record, L. A. W. BURDER. Det. KEW.

†497/9. *SYMPHYTUM GRANDIFLORUM* DC. Clapgate, Wimborne, Dorset, v.-c. 9, Miss B. GULLICK, comm. N. D. SIMPSON.

†499/1. *TRACHYSTEMON ORIENTALE* D. Don. Shoreham, W. Kent, v.-c. 16, found in full flower at the end of March by Mrs R. A. L. COLE, L. A. W. BURDER. Det. KEW.

506/10b. *MYOSOTIS VERSICOLOR* Sm., var. *LUTEA* DC. Loch Coron, Anglesey, v.-c. 52, E. VACHELL.

509/2. *ECHIU M PLANTAGINEUM* L. Polperro, E. Cornwall, v.-c. 2, J. G. LAWN.

511/1b. *VOLVULUS SEPIUM* Medik., var. *COLORATUS* Lange. Entrance to Angley Wood at Cranbrook, E. Kent, v.-c. 15, J. P. M. BRENNAN.

†512/2. *Ipomaea hederacea* Jacq. Olympia sidings, Selby, S.E. Yorks. v.-c. 61, W. A. SLEDGE. Det. KEW.

†512/3. *Ipomaea sibirica* Pers. Olympia sidings, Selby, S.E. Yorks, v.-c. 61, W. A. SLEDGE. Det. KEW.

†517/14. *SOLANUM SISYMBRIIFOLIUM* Lam. Olympia sidings, Selby, S.E. Yorks, v.-c. 61, W. A. SLEDGE.

†517/20. *Solanum gracile* Dunal. Barry Docks, Glamorgan, September 1935, temperate S. America, C. I. SANDWICH and J. P. M. BRENNAN.

†518/7. *PHYSALIS PERUVIANA* L. Ashton Gate, Bristol, N. Somerset, v.-c. 6, October 1934, C. I. SANDWICH.

†521/1. *ATROPA BELLADONNA* L. Tip at Dagenham, S. Essex, v.-c. 18, J. P. M. BRENNAN.

†522/1. *Datura stramonium* L. Hillsley, W. Gloster, v.-c. 34, J. P. M. BRENNAN.

†524/5. *Hyoscyamus reticulatus* L. Native of the Orient, determined at Kew. Found at Broughton Wood, N. Lincs, v.-c. 54, in a clearing that had been recently replanted. Considerable quantities of pheasant food were brought here from Grimsby 30 years ago, and no doubt the seeds were introduced with this and have lain dormant until the recent soil disturbance has brought them to the surface and made germination possible. The native *H. niger* was in abundance on the same piece of ground, F. T. BAKER.

†525/5. *Nicotiana alata* Link et Otto. Ashton Gate, Bristol, N. Somerset, v.-c. 6, September 1935, a form with purplish-blue corollas, C. I. SANDWITH and J. P. M. BRENNAN.

†525/6. *Nicotiana longiflora* Cav. Casual, Wapping Wharf, Bristol Harbour, v.-c. 34, August 1935, temperate South America, H. J. GIBBONS.

†527/15. *Verbascum ovalifolium* Sims. (*V. pulchrum* Vel.). Avonmouth Docks, W. Gloucester, v.-c. 34, November 1934, C. I. SANDWITH.

†532/2. *Linaria purpurea* Mill. Chalky railway cutting between Walmer and Deal, E. Kent, v.-c. 15, J. P. M. BRENNAN.

†532/21. *Linaria rubrifolia* Rob. & Cast. Still on walls near W. Malling Abbey, W. Kent, v.-c. 16, one plant with white flowers tinged with green and paler foliage, J. P. M. BRENNAN.

532/24b. *Linaria spuria* (L.) Mill., var. *peloria* Dr. Among the type in a field by Pluck's Gutter, E. Kent, v.-c. 15, J. P. M. BRENNAN.

†535/1. *Scrophularia vernalis* L. In woods, Minto, Roxburgh, v.-c. 80, Miss P. LEAKE.

543/17(2). *Veronica praecox* All. Two specimens seen in a field near Kilverstone, W. Norfolk, v.-c. 28, 12th May 1935. Also found by Miss M. S. Campbell in great quantity between Barton Mills and Tuddenham, and reported to me (Miss E. M. Bass *in lit.*) as in quantity near Brandon, W. Suffolk, v.-c. 26, A. J. WILMOTT.

543/19. *Veronica agrestis* L., f. *rosea* Fournier. Garden of Farington House, Leyland, S. Lancs, v.-c. 59, H. E. BUNKER.

543/20. *Veronica polita* Fries. Roadside between Bathford and Limpley Stoke, N. Somerset, v.-c. 6, J. P. M. BRENNAN. Very luxuriant specimens of the f. *calycida* Abromeit & Scholz.

†543/34. *Veronica crista-galli* Stev. Roadside near Bathford, N. Somerset, v.-c. 6, J. P. M. BRENNAN.

†543/41. *VERONICA FILIFORMIS* Sm. Garden outcast, Kingsley, N. Hants, v.-c. 12, P. M. HALL, N. D. SIMPSON, and E. C. WALLACE.

545/3. *EUPHRASIA BREVIPILA* Burnat et Greml. Ty Mawr, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE. Det. H. W. PUGSLEY.

545/5d. *EUPHRASIA NEMOROSA* Pers., var. *COLLINA* Pugl. Cronkley Pastures, N.W. Yorks, v.-c. 65, H. PHILLIPS. Det. H. W. PUGSLEY.

545/10. *EUPHRASIA OCCIDENTALIS* Wettst. Ynys Las, near Borth, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE. Det. H. W. PUGSLEY.

545/15. *EUPHRASIA MICRANTHA* Rechb. Cautley Spout, N.W. Yorks, v.-c. 65, H. PHILLIPS. Det. H. W. PUGSLEY.

*545/16. *EUPHRASIA SCOTICA* Wettst. Near Austwick Moor, Mid-west Yorks, v.-c. 64, H. PHILLIPS; Ty Mawr, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE. Both det. H. W. PUGSLEY.

545/18. *EUPHRASIA CONFUSA* Pugsley, f. *ALBIDA*. Caswell Bay, Gower, Glamorgan, v.-c. 41; *Hawby and near Rievaulx, N.E. Yorks, v.-c. 62, H. PHILLIPS. Det. H. W. PUGSLEY.

545/19c. *EUPHRASIA ROSTKOVIANA* Hayne., var. *OBSCURA* Pugsl. Ty Mawr, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE. Det. H. W. PUGSLEY.

*545/19c. *EUPHRASIA ROSTKOVIANA* Hayne, probably var. *OBSCURA* Pugsl., teste ipso. Selkirkshire, v.-c. 79, first record for Scotland, E. O. CALLEN in *Journ. Bot.*, lxxiii, 53.

545/19(2). *EUPHRASIA PSEUDO-KERNERI* Pugsley. Downs above Upper Malling, W. Kent, v.-c. 16, J. P. M. BRENNAN.

*545/19(4). *EUPHRASIA ANGLICA* Pugsl. Near Verwood, R. D.'O. Good; near Littlesea, P. M. HALL, both Dorset, v.-c. 9. Det. H. W. PUGSLEY.

*548/5. *RHINANTHUS STENOPHYLLUS* Schur. Kinvarra, S.E. Galway, v.-c. H. 15, N. D. SIMPSON.

549/4e. *MELAMPYRUM PRATENSE* L., var. *VULGATUM* (Pers.) Beck., sub-var. *LAURIFOLIUM* Beauv. Milton-Hordle road, S. Hants, v.-c. 11, N. D. SIMPSON.

549/4j. *MELAMPYRUM PRATENSE* L., var. *HIANS* Dr., f. *PLATYPHYLLUM* Beauv. Above Loch Dromineer, Glencar, S. Kerry, v.-c. H. 1, N. D. SIMPSON.

551/1. *LATHRAEA SQUAMARIA* L. Upon Hazel, Minto, Roxburgh, v.-c. 80, Miss P. LEAKE.

553/4. *PINGUICULA LUSITANICA* L. Near Aldershot, N. Hants, v.-c. 12, Lt.-Col. G. WATTS. Although recorded from this locality in B.E.C. 1919 Rep., 671 (1920), neither *Comital Flora* nor *Top. Bot.* 2nd Supplement gives this species for N. Hants. This is the most easterly station recorded in Britain; prior to this Purbrook Common, S. Hants (just N. of Portsmouth) held this position. The plant is to be looked for in S.W. Surrey; P. M. HALL.

Han.

558/1. *MENTHA ROTUNDFOLIA* Huds. By the Avon, Aveton, Gifford, S. Devon, v.-c. 3, N. D. SIMPSON and A. L. STILL.

558/3. *MENTHA LONGIFOLIA* Huds. Stream side near St Columb Minor, W. Cornwall, v.-c. 1, a form with rather broad leaves and small spikes, perhaps a hybrid, N. D. SIMPSON and A. L. STILL.

558/3×1. *MENTHA LONGIFOLIA* (L.) Huds. × *ROTUNDFOLIA* (L.) Huds. = × *M. NILIACA* Jacq., var. *VILLOSA* Huds. Hicks Mill, Bissoe, W. Cornwall, v.-c. 1, N. D. SIMPSON and A. L. STILL.

558/4. *MENTHA SPICATA* Huds. By the Dart, Buckfastleigh, S. Devon, v.-c. 3, N. D. SIMPSON and A. L. STILL; Llanmadoc, Gower, Glamorgan, v.-c. 41, A. L. STILL; rubbish tip near Pickersleigh, Worcs, v.-c. 37, F. M. DAY.

558/6a. *MENTHA PIPERITA* L., var. *OFFICINALIS* Sole. Ewhurst, Surrey, v.-c. 17, A. L. STILL.

558/6e. ×*MENTHA CITRATA* Ehrh. Tresadderne Farm, Lizard, W. Cornwall, v.-c. 1, N. D. SIMPSON and A. L. STILL.

558/7c. *MENTHA AQUATICA* L., var. *LOBELIANA* Beck. Vaun Lane, Chiddingfold, Surrey, v.-c. 17, A. L. STILL.

558/7×12. *MENTHA AQUATICA* L. × *RUBRA* Sm. In *Fl. Herts* as *M. citrata* Ehrh. (Coleman, 1843). Det., as probably *rubra* × *citrata*, by J. Fraser from a sheet in Hb. Druce. Roydon, Herts, v.-c. 20, A. L. STILL; canal, Exeter, S. Devon, v.-c. 3, Rev. T. STEPHENSON; probably this by the Avon, Aveton Gifford, S. Devon, v.-c. 3, A. L. STILL and N. D. SIMPSON.

558/9. *MENTHA VERTICILLATA* L., forma. Hartland Farm, King's Brompton, S. Somerset, v.-c. 5. The Rev. E. S. Marshall thought this might be a hybrid of *M. piperita* and *M. verticillata*. It is an unusual form, but might equally well be *piperita* × *arvensis*, as these two plants are growing close together, whereas the *M. verticillata* is rather remote, N. D. SIMPSON and A. L. STILL.

558/9b. *MENTHA VERTICILLATA* L., var. *PALUDOSA* Sole. Braunton Burrows, N. Devon, v.-c. 4, F. M. DAY.

558/9n. *MENTHA VERTICILLATA* L., var. *RUBRO-HIRTA* Briq. Chyvagne, Perranarworthal, W. Cornwall, v.-c. 1, N. D. SIMPSON and A. L. STILL; near Hillhead, Brixham, and a very robust terrestrial form at Upton Farm, Brixham, S. Devon, v.-c. 3, F. M. DAY.

558/9p. *MENTHA VERTICILLATA* L., var. *TRICHODES* Briq. A sheet in the Hiern Hb. appears to be this variety, but I have not been able to get fresh material for confirmation. Bish Mill, Bishop's Nympton, N. Devon, v.-c. 4, A. L. STILL.

558/10. *MENTHA GENTILIS* L. By the Dart, Buckfastleigh; by the Avon, Aveton Gifford, S. Devon, N. D. SIMPSON and A. L. STILL.

558/10e. *MENTHA GENTILIS* L., var. *RESINOSA* (Opiz) Briq. "Meavy, S. Devon" (the first record from Britain, Waterfall, 1877), still there, but very scarce, N. D. SIMPSON and A. L. STILL; "by the Dart, Buckfastleigh, S. Devon" (sheet in Hb. Hiern, Exeter Museum), located by Miss K. BRAY, collected by A. L. STILL and N. D. SIMPSON.

*558/11. \times *MENTHA CARDIACA* Baker. Shapwick, Dorset, v.-c. 9, N. D. SIMPSON.

558/12. *MENTHA RUBRA* Sm. Barnard's Green, Malvern, Worcs, v.-c. 37, F. M. DAY.

558/13d. *MENTHA ARVENSIS* L., var. *AGRESTIS* Sole. Hartland Farm, King's Brompton, S. Somerset, v.-c. 5, N. D. SIMPSON and A. L. STILL.

561/1. *THYMUS PULEGIOIDES* L. Old quarry near Twerton, Bath, N. Somerset, v.-c. 6, J. P. M. BRENNAN.

*561/10. *THYMUS NEGLECTUS* Ronn. Black Head, Clare, v.-c. H. 9; *Raven Point, Wexford, v.-c. H. 12; *Kinvarra, S.E. Galway, v.-c. H. 15; *Dogs Bay, Roundstone, W. Galway, v.-c. H. 16, N. D. SIMPSON.

*†565/1. *MELISSA OFFICINALIS* L. Outcast, Shapwick, Dorset, v.-c. 9, N. D. SIMPSON.

572/1 \times 2. *SCUTELLARIA GALERICULATA* L. \times *MINOR* Huds. Wood at the S.E. end of Broadwater Forest, Tunbridge Wells, E. Sussex, v.-c. 14; wood near Pembury Waterworks, W. Kent, v.-c. 16, very abundant, J. P. M. BRENNAN. Sus

573/2. *PRUNELLA LACINIATA* L. Thorndale, E. Gloster, v.-c. 33, Miss L. ABELL; *Southern Cliffs of Alderney, Channel Islands, September 1932, R. A. F. BRENNAN; *Salisbury Plain between Bulford and Tidworth, S. Wilts, v.-c. 8, D. B. FANSHAWE. Gl.

577/4. \times *STACHYS AMBIGUA* Sm. E. side of Broadwater Forest, Tunbridge Wells, E. Sussex, v.-c. 14, J. P. M. BRENNAN. Sus

†577/12(3). *Stachys Ocymastrum* (L.) Briq. Better known as *S. hirta* L. Waste ground, Bristol, W. Gloucester, v.-c. 34, June 1935, Western Mediterranean region, C. I. and N. Y. SANDWITH.

585(2)/1. *AMETHYSTEA CAERULEA* L. Olympia sidings, Selby, S.E. Yorks, v.-c. 61, W. A. SLEDGE. See *Rep. B.F.C.*, 279, 1930, for previous record.

*587/2. *AJUGA PYRAMIDALIS* L. Rosettes observed in 1931 above L. Maree, W. Ross, v.-c. 105; flowering June 1935, A. J. WILMOTT and F. DRUCE.

†588/1. *PLANTAGO INDICA* L. Dagenham, S. Essex, v.-c. 18, J. P. M. BRENNAN.

†596/6. *AMARANTHUS RETROFLEXUS* L. Dagenham, S. Essex, v.-c. 18, J. P. M. BRENNAN.

K †596/11. *AMARANTHUS BLITUM* L. Waste places about Bromley, W. Kent, v.-c. 16, F. R. BROWNING. Det. KEW.

600/1g. *CHENOPODIUM RUBBUM* L., var. *KOCHILIFORME* MUIT. Dagenham, S. Essex, v.-c. 18. Mrs Sandwith kindly looked at the specimen and concurred in the identification. J. P. M. BRENNAN.

†600/11. *CHENOPODIUM LEPTOPHYLLUM* (Nutt.) Britt. Dagenham, S. Essex, v.-c. 18, J. P. M. BRENNAN.

K. *†600/13. *CHENOPODIUM GLAUCUM* L. Near Hill House, Shotley, E. Suffolk, v.-c. 25, RONALD BURN; tip at High Brooms, W. Kent, v.-c. 16; *Newport Corporation Tip, Monmouth, v.-c. 35, J. P. M. BRENNAN; near Bidborough, W. Kent, v.-c. 16, J. E. LOUSLEY.

†600/31(3). *CHENOPODIUM GIGANTEUM* DON. (= *C. AMARANTICOLOR* Coste et Reynier). Avonmouth Docks, W. Gloucester, v.-c. 34, September 1934-35, C. I. SANDWITH and H. J. GIBBONS. Det. P. AELLEN.

606/18. *ATRIPLEX PEDUNCULATA* L. A few plants of this now very rare species were seen in East Anglia in October 1934, J. E. LOUSLEY. Self.

611/3. *SALICORNIA DOLICHOSTACHYA* Moss. Cuckmere Haven, E. Sussex, v.-c. 14, L. A. W. BURDER. Sus.

615/5c. *POLYGONUM AMPHIBIUM* L., var. *GLANDULOSUM* Schönheit. Loch Leven, Kinross, v.-c. 85, N. D. SIMPSON.

615/6 × 7. *POLYGONUM LAPATHIFOLIUM* L. × *PERSICARIA* L. On mud dredged from Petersfield Heath Pond, S. Hants, v.-c. 11, P. M. HALL and E. C. WALLACE. Det. C. E. BRITTON.

615/6e. *POLYGONUM LAPATHIFOLIUM* L., var. *RUDERALE* Schuster. Grangetown, Glamorgan, v.-c. 41, E. VACHELL. Det. C. E. BRITTON.

615/6f. *POLYGONUM LAPATHIFOLIUM* L., var. *TOMENTOSUM* Beck. Sp'ott, Cardiff, Glamorgan, v.-c. 41, E. VACHELL. Det. C. E. BRITTON.

615/8b. *POLYGONUM NODOSUM* Pers., var. *INCRASSATUM* Rouy, f. *STENOPHYLLUM* C. E. Britt. Canton Common, Glamorgan, v.-c. 41, E. VACHELL. Det. C. E. BRITTON.

615/8d. *POLYGONUM NODOSUM* Pers., var. *ERECTUM* Rouy. On mud dredged from Petersfield Heath Pond, S. Hants, v.-c. 11, P. M. HALL and E. C. WALLACE; Grangetown, Glamorgan, v.-c. 41, E. VACHELL. Both det. C. E. BRITTON.

615/9 × 11. *POLYGONUM HYDROPIPER* L. × *MINUS* Huds. Amberley Wild Brooks, W. Sussex, v.-c. 13, J. E. LOUSLEY, P. M. HALL, and E. C. WALLACE. Det. C. E. BRITTON.

615/11a. *POLYGONUM MINUS* Huds., var. *COMMUNE* A. Br. Amberley Wild Brooks, W Sussex, v.-c. 13, P. M. HALL. Det. C. E. BRITTON.

615/14m. *POLYGONUM AVICULARE* L., var. *ANGUSTISSIMUM* Meisn. Near Cardiff, Glamorgan, v.-c. 41, E. VACHELL. Det. C. E. BRITTON.

†615/31. *POLYGONUM POLYSTACHYUM* Wallich. St John, Millbrook, E. Cornwall, v.-c. 2; recess, Galway road, W. Galway, v.-c. H. 16, N. D. SIMPSON.

†615/33. *POLYGONUM SACHALINENSE* Schmidt. Milford-on-Sea, S. Hants, v.-c. 11, N. D. SIMPSON.

†618/3×29. *RUMEX CRISPUS* L. × *OBOVATUS* Danser. × *R. Bontei* Danser, *ex char., descr. et fig.* Avonmouth Docks, W. Gloucester, v.-c. 34, September 1928, C. I. and N. Y. SANDWITH.

618/6×11. *RUMEX OBTUSIFOLIUS* L. × *R. PULCHER* L. Shalford Common, Surrey, and Alfriston, E. Sussex, v.-c. 14, J. E. LOUSLEY. *Surr.*

618/9×13. *RUMEX CONGLOMERATUS* L. × *R. MARITIMUS* L. Binsey Common, Oxon, v.-c. 23, confirmed by Dr K. H. RECHINGER, J. E. LOUSLEY. *Ox.*

618/12. *RUMEX PALUSTRIS* Sm. Yiewsley, Middlesex, v.-c. 21, J. P. M. BRENNAN. *Middlx.*

~~618/13. *RUMEX MARITIMUS* L. Dykes near Tripcock Ness, W. Kent, v.-c. 16, September 1933, J. P. M. BRENNAN.~~

~~625/1. *HIPPOPHAE RHAMNOIDES* L. An enormous clump at the S. end of Pegwell Bay, E. Kent, v.-c. 15, J. P. M. BRENNAN.~~

†*628/10b. *EUPHORBIA ESULA* L., var. *PINIFOLIA* Dr. Marston Green, Warwickshire, v.-c. 38, growing on tip of ashes, LESLIE T. ADAMS.

†*628/11. *EUPHORBIA CYPARISSIAS* L. Near Andoversford, E. Gloster, v.-c. 33, very sparse and decreasing, Miss L. ABELL. *Gl.*

†*628/16. *EUPHORBIA LATHYRIS* L. Avonmouth Docks, W. Gloster, v.-c. 34, J. P. M. BRENNAN.

†636/1. *FIGUS CARICA* L. Several bushes on the river-wall by the Thames between Kew and Mortlake, Surrey, v.-c. 17, R. N. PARKER and J. P. BRENNAN.

642/3 × 2. *BETULA NANA* L. × *PUBESCENS* Ehrh. Caenlochan Glen, Angus, v.-c. 90, E. C. WALLACE.

K †651/6. *POPULUS TACAMAHACCA* Mill. Sand-pit at Aylesford, E. Kent, v.-c. 15, J. P. M. BRENNAN. *V*

*652/2. *EMPETRUM HERMAPHRODITUM* Hag. Several places about Braemar, S. Aberdeen, v.-c. 92, E. C. WALLACE.

*658/1. *HYDRILLA VERTICILLATA* Presl. Discovered in Ireland, August 1935, near Renvyle, Connemara. Vouching specimens have been sent to the National Museum, Dublin; the British Museum, and Kew. Dr. W. H. PEARSALL.

K 668/2e. *EPIPACTIS LATIFOLIA* All., var. *PURPUREA* Celak. Wood between Romford and Matfield, W. Kent, v.-c. 16, in deep shade with stem 80 cm. high and showing 55 flowers, W. H. PEARSALL.

*669/1. *ORCHIS PURPUREA* Huds. Walter Belchamp Parish, N. Essex, v.-c. 19, Samuel Dale, 1738. Dale's specimen is in Herb. Mus. Brit. and in a biographical note on Dale in *Journ. Bot.*, 1883, 231, G. S. Boulger referred to it as *O. militaris* L., which is the authority given for the record of that species for v.-c. 19 in the first supplement of *Topographical Botany*. But the specimen is *O. purpurea* Huds., and the names cited on Dale's label are early synonyms for that species and not *O. militaris* L. There have been no other records of this species from Essex, P. M. HALL.

669/6. *ORCHIS PARDALINA* Pugsley. Lambriggan, near Perranporth, W. Cornwall, v.-c. 1, F. RILSTONE, comm. P. M. HALL; Axmouth, S. Devon, v.-c. 3, Dr T. STEPHENSON; Titchfield, S. Hants, v.-c. 11, P. M. HALL; Easter Softlaw, near Kelso, Roxburghshire, v.-c. 80, W. HANDYSIDE, comm. P. M. HALL. *Han*

669/7. *ORCHIS LATIFOLIA* L., sec. Pugsley. (*O. INCARNATA* auct. non L.). Eckford, Roxburghshire, v.-c. 80, and Aberlady, Haddingtonshire, v.-c. 82, W. HANDYSIDE. Comm. P. M. HALL.

669/7c. *ORCHIS LATIFOLIA* L., var. *PULCHELLA* (Dr.) Pugsl. Stoborough, Dorset, v.-c. 9, Dr T. STEPHENSON; near Strata Florida Station, Tregaron, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE.

669/7d. *ORCHIS LATIFOLIA* L., var. *COCCINEA* Pugsl. Kenfig, Glamorganshire, v.-c. 41; between Kidwelly and Pembrey, Carmarthenshire, v.-c. 44, P. M. HALL and W. A. SLEDGE.

669/7 × 9. *ORCHIS LATIFOLIA* L. × *PURPURELLA* Steph. Near Borth, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE.

669/8. *ORCHIS PRAETERMISSA* Dr. Marsh at edge of burrows between Kidwelly and Pembrey, Carmarthenshire, v.-c. 44, P. M. HALL and W. A. SLEDGE.

669/9. *ORCHIS PURPURELLA* Stephenson. *Near Mentieth, W. Perth, v.-c. 87; *near Kirkmichael, E. Perth, v.-c. 89, J. F. G. CHAPPLE; Ynys Las, near Borth, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE; *Eckford and Melrose, Roxburghshire, v.-c. 80; Aberlady, Haddingtonshire, v.-c. 82; *Balerno and many localities in the Pentlands, Midlothian, v.-c. 83; *a form related to this species, Burntisland, Fifeshire, v.-c. 85, Wm. HANDYSIDE, comm. P. M. HALL; *Kinloch Rannoch, Mid Perthshire, v.-c. 88, J. F. G. CHAPPLE, comm. P. M. HALL. *Note*.—In some of these northern counties this species may have been previously recorded under the name *O. praetermissa*, var. *pulchella*.—P.M.H.

669/9(2)b. *ORCHIS MAJALIS* Reichb., var. *OCIDENTALIS* Pugsley. At present only known to occur in Ireland, has been recorded from Clare and Galway, R. L. PRAEGER; see also H. W. PUGSLEY in Abstracts.

669/10. *ORCHIS MACULATA* L. *Between Kidwelly and Pembrey, Carmarthenshire, v.-c. 44; Ty Mawr, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE; Balerno, etc., Midlothian, v.-c. 83, W. HANDYSIDE, comm. P. M. HALL; Kinloch Rannoch, Mid Perthshire, v.-c. 88, J. F. G. CHAPPLE, comm. P. M. HALL; Ben Macdhui, altitude 3500 ft., S. Aberdeen, v.-c. 92, E. C. WALLACE; *near Mentieth, W. Perth, v.-c. 87, J. F. G. CHAPPLE.

669/10 × 9. *ORCHIS MACULATA* L. × *PURPURELLA* Steph. Near Cwm Woods, Aberystwyth, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE; Kinloch Rannoch, Mid Perthshire, v.-c. 88, J. F. G. CHAPPLE, comm. P. M. HALL; near Mentieth, W. Perth, v.-c. 87, with both parents, J. F. G. CHAPPLE.

669/11. *ORCHIS FUCHSII* Dr. Near Boughrood, Radnorshire, v.-c. 43, and Cwm Woods, Aberystwyth, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE. (Add both v.-c.s to *Comital Flora* but previously

recorded in *List of Welsh Flowering Plants*.) *Eckford and Melrose, Roxburghshire, v.-c. 80; *Balerno, Midlothian, v.-c. 83; *Burntisland, Fifeshire, v.-c. 85, W. HANDYSIDE, comm. P. M. HALL; *Killean, Kintyre, v.-c. 101, MRS MACALISTER HALL, comm. P. M. HALL; *Bridge of Cally, E. Perth, v.-c. 89, J. F. G. CHAPPLE.

669/11 × 9. ORCHIS FUCHSII Dr. × PURPURELLA Steph. Near Melrose, Roxburghshire, v.-c. 80; Coates, Balerno, etc., Midlothian, v.-c. 83, W. HANDYSIDE, comm. P. M. HALL.

*669/14. ORCHIS MASCULA L. On May 6th we came across a number of specimens growing on the Ayre itself, just at the back of the sand dunes at Rue Point. As *O. mascula* is stated to be in need of confirmation in C. F. Paton's *Flora of the Isle of Man*, specimens were sent to Mr W. H. Pearsall, who identified them as being undoubtedly *O. mascula* L., W. S. COWIN.

669/17. ANACAMPTIS PYRAMIDALIS (L.) Rich. *Between Kidwelly and Pembrey, Carmarthenshire, v.-c. 44; Ynys Las, near Borth, Cardiganshire, v.-c. 46, very scarce in the county, P. M. HALL and W. A. SLEDGE.

672/2. OPHRYS ARANIFERA Huds. Denbies, above Dorking, Surrey, v.-c. 17, removes ? in *Comital Flora* [v.v.s. W.H.P.], J. G. LAWN. Sur,

672/4. OPHRYS APIFERA Huds., var. TROLLII Heg. Rodborough Common near Stroud, E. Gloster, v.-c. 33, C. T. AMHERST. Gl,

674/1. GYMNADENIA CONOPSEA R. Br. Ty Mawr, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE. (Add to *Comital Flora* but not N.C.R.; see *Top. Bot.*, 2nd Supplement, and *List of Welsh Flowering Plants*.)

674/1 × 669/10. GYMNADENIA CONOPSEA R. Br. × ORCHIS MACULATA L. = × ORCHIGYMNADENIA SOUPPENSIS G. Camus. Ty Mawr, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE.

674/3. GYMNADENIA ALBIDA (L.) Rich. Ty Mawr, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE.

691/3. POLYGONATUM OFFICINALE All. Lineover, E. Gloster, v.-c. 33, Miss L. ABELL. Gl,

702/4c. ALLIUM VINEALE L., var. COMPACTUM Thuill. Thorndale, E. Gloster, v.-c. 33, Miss L. ABELL. Gl,

711/1. GAGEA LUTEA (L.) Ker-Gawler. Near Downton, S. Wilts, v.-c. 8, Miss GULLICK. An addition to *Comital Flora* but not a new record as the previously-recorded station at Wexcombe is in South Wilts and not in North Wilts as Druce supposed. The Downton station is W,

within a few feet of the boundary of South Hants, but does not actually cross it. Comm. P. M. HALL.

*716/1. *PARIS QUADRIFOLIA* L. Scalpay Island, North Ebudes, v.-c. 104, Prof. J. W. HESLOP HARRISON.

718/14. *JUNCUS COMPRESSUS* Jacq. Roadside, West Harnham, Salisbury, S. Wilts, v.-c. 8, Miss B. GULLICK.

*718/18. *JUNCUS PYGMAEUS* Rich. Raasay Island, Hebrides, v.-c. 104, new to Scotland and a great northerly extension of its distribution, J. W. HESLOP HARRISON. Det. W. H. PEARSALL (Spm. in Herb. Mus. Brit.).

718/20. *JUNCUS CASTANEUS* Sm. Corrie Kander, S. Aberdeen, v.-c. 92, very tall, E. C. WALLACE.

719/3. *LUZULA FORSTERI* Sm. Wood near Goring, Oxford, v.-c. 23, R. C. BURGESS.

719/7. *LUZULA ARCUATA* Wahl. Summit of Ben Avon, S. Aberdeenshire, v.-c. 92, Lady D. COLQUHOUN; on the Banff side of Ben Avon, v.-c. 94, E. C. WALLACE.

*723/1c. *ARUM ITALICUM* Mill., var. *neglectum* Towns. Scattered over the parish of Braunton, N. Devon, v.-c. 4, Dr F. R. E. WRIGHT. Det. KEW.

*723/2. *ARUM MACULATUM* L. Growing freely and fruiting, in a roadside hedge-bottom at Southend, 10 miles S. of Campbeltown, Kintyre, v.-c. 101, LATIMER McINNES; Fintry, Stirling, v.-c. 86, MATTHEW M. BIRD.

K *728/1. *WOLFFIA ARRHIZA* (L.) Wimm. Sparingly in a pond by the railway one mile east of Marden, W. Kent, v.-c. 16, J. P. M. BRENNAN.

737/11e. ×*POTAMOGETON NITENS* Weber, var. *SUBGRAMINEUS* (Raunk.) Hagstr. Canal, Woking, Surrey, v.-c. 17, Lt.-Col. G. WATTS.

737/13b. ×*POTAMOGETON LUCENS* L., var. *ACUMINATUS* (Schum.) Fries. Canal, Woking, Surrey, v.-c. 17, Lt.-Col. G. WATTS.

737/16d. *POTAMOGETON PERFOLIATUS* L., var. *ROTUNDIFOLIUS* Wallr. Collected during the L.N.U. meeting at Revesby, N. Lincs, v.-c. 54, July 1935, F. T. BAKER. Det. W. H. PEARSALL.

L.K. 737/19. *POTAMOGETON ACUTIFOLIUS* Link. Dyke between Appledore Station and the village, E. Kent, v.-c. 15, J. P. M. BRENNAN.

737/20. *POTAMOGETON OBTUSIFOLIUS* M. & K. Canal, Woking, Surrey, v.-c. 17, in fine fruiting condition, 27th September 1935, Lt.-Col. G. WATTS.

737/22. *POTAMOGETON FRIESII* Rupr. Canal, Woking, Surrey, v.-c. 17, Lt.-Col. G. WATTS.

737/24. *POTAMOGETON RUTILUS* Wolfgang. Llyn Coron, Anglesey, v.-c. 52. First discovered here by J. Griffith in 1892 and still exists. Fresh leaves from this lake were gathered by Mrs Knowling and sent to me in July 1935. They were undoubtedly those of this species. W. H. PEARSALL.

*738/1. *RUPPIA MARITIMA* L. Dyke near Long Bank, Kilnsea, S.E. Yorks, v.-c. 61, W. A. SLEDGE.

744/1. *CYPERUS LONGUS* L. Edge of pond, Holmwood Common, Surrey, v.-c. 17: origin unknown, only previous record for Surrey is Witley, where it is said to have been planted, H. N. RIDLEY in *Journ. Bot.*, lxxiii (1935), 362. S

*745/2. ~~*ELEOCHARIS UNIGLUMIS*~~ Schultes. In plenty, Horsey Marsh, Braunton, N. Devon, v.-c. 4, Dr F. R. ELLISTON WRIGHT. Det. WILMOTT. Baglan Marsh and by Ewenny River, Ogmere, Glamorgan, v.-c. 41, A. L. STILL. D

747(5). *ERIOPHORUM ALPINUM* L. The area indicated by Prof. Fernald on sketch maps to both A. J. Wilmott and Miss E. Vachell has been thoroughly examined, first in 1931 by A. J. W. and F. Druce, as well as by a party of four persons from Edinburgh, including Sir W. Wright Smith and R. M. Adams, and again in 1935 by A. J. W. and F.D., with N. D. Simpson, Miss M. S. Campbell and Miss E. Vachell. Altogether some 33 man-hours have been spent on this restricted area without any trace of the species being seen, and until Prof. Fernald or someone else revisits the spot with success the record should be disregarded. A. J. WILMOTT.

753/1. *CAREX PSEUDO-CYPERUS* L. Pinn's Green, Madresfield, Worcester, v.-c. 37, at the side of the main road between Worcester and Malvern, F. M. DAY.

753/4. *CAREX VESICARIA* L. Bank of R. Teifi, above Tregaron, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE.

753/8. *CAREX LASIOCARPA* Ehrh. Wilverley Marsh, New Forest, S. Hants, v.-c. 11, J. G. LAWN. Ha

753/9d. *CAREX HIRTA* L., var. *SPINOSA* Mortensen. West Hoathly, E. Sussex, v.-c. 14, L. PALMER.

753/14. *CAREX CAPILLARIS* L. Sparingly in boggy ground at top of cliffs at High Cup Nick, Westmorland, v.-c. 69, July 1934, A. H. G. ALSTON and N. Y. SANDWICH. [Not a N.C.R., although omitted from the *Comit. Fl.* There are two previous records, "By the Maize Beck" (Teesdale), J. A. Martindale, specimen in the Martindale Hbm., Kendal Museum; and "Waitby near Kirkby Stephen," Miss Mason, specimen authenticated by Mr A. Wilson.—W.H.P.]

*753/30. *CAREX MONTANA* L. Cliffs, Carbis Bay, W. Cornwall, v.-c. 1. The record for E. Cornwall is unsatisfactory. Carbis Bay is the extreme western limit of the European range of the species, J. E. LOUSLEY.

753/46j. *CAREX GRACILIS* Curt., var. *TRICOSTATA* (Fr.) Asch. In the Ewenny River, Glamorgan, v.-c. 41, A. L. STILL. Det. W. H. PEARSALL.

753/47. *CAREX AQUATILIS* Wahl. Very abundant in the Teifi Marshes and on the banks of the R. Teifi above and below Tregaron, Cardiganshire, v.-c. 46. *C. gracilis* is also recorded from this locality, but we did not see it. P. M. HALL and W. A. SLEDGE.

*753/51. *CAREX RIGIDA* Good. Tinto Hill, Lanark, v.-c. 77, E. C. WALLACE.

753/62. *CAREX DIVULSA* Stokes. Fairly open spinney near Oxford, v.-c. 23, R. C. BURGESS.

753/67b. *CAREX ARENARIA* L., var. *REMOTA* Marss. Near Borth, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE.

K +754/1. *PANICUM MILIACEUM* L. Cultivated fields near Owe Creek, E. Kent, v.-c. 15, J. P. M. BRENNAN.

K +754/2. *PANICUM CAPILLARE* L. Tonbridge Corporation Tip, W. Kent, v.-c. 16, J. P. M. BRENNAN.

+754/7(2). *Panicum virgatum* L. Near Salisbury, S. Wilts, v.-c. 8, H. J. GODDARD. Det. C. E. HUBBARD.

+754(3)/1. *Brachiaria isachne* (Roth) Stapf. Roadside at Waltouin-Gordano, v.-c. 6, det. C. E. HUBBARD, J. P. M. BRENNAN.

758/2. *SPARTINA STRICTA* (Ait.) Roth. Marshes at Shellness, Sheppey, E. Kent. v.-c. 15, J. P. M. BRENNAN.

K 758/3. *SPARTINA TOWNSENDII* H. & J. Groves. Brooks west of Dungeness, v.-c. 15, J. P. M. BRENNAN; *Portskewett, Monmouth, v.-c. 35, thoroughly established, 1935, E. VACHELL.

†763/3. *SORGHUM CERNUUM* Willd. Grangetown, Cardiff, v.-c. 41, Mrs SANDWICH, Miss VACHELL, and J. P. M. BRENNAN; Dagenham, v.-c. 18, J. P. M. BRENNAN.

K 766/1c. *ANTHOXANTHUM ODORATUM* L., var. *VILLOSUM* Lois. A very robust plant with hairy leaf-sheaths and glumes, on sandy ground at Wrotham Heath, W. Kent, v.-c. 16, J. P. M. BRENNAN.

770/2b. *ALOPECURUS ALPINUS* Sm., var. *WATSONI* Syme. On the Glas Maol and in Glen Callater, S. Aberdeen, v.-c. 92, E. C. WALLACE.

770/4. *ALOPECURUS BULBOSUS* Gouan. Salt marsh, west side of Hayling Island, S. Hants, v.-c. 11, P. M. HALL.

770/6. *ALOPECURUS AEQUALIS* Sobol. Near Grazeley Green, Berkshire, v.-c. 22, P. M. HALL and N. D. SIMPSON.

*783/1. *CALAMAGROSTIS EPIGEIOS* Roth. One small clump in a wood 12 miles N. of Campbeltown, Argyll, v.-c. 101, LATIMER McINNES.

794/3b. *AVENA PRATENSIS* L., var. *ALPINA* Sm. With dense panicle and broad leaves (6 mm.), Caenlochan Glen, Angus, v.-c. 90, E. C. WALLACE.

K †808/1. *CYNOSURUS ECHINATUS* L. One plant by the roadside, Denham Village, Bucks, v.-c. 24, C. E. MARKS; in abundance on dry heathy banks on Hayes Common, and in waste places about the village, W. Kent, v.-c. 16, F. R. BROWNING (add to *Comital Flora*); *Weymouth, Dorset, v.-c. 9, N. D. SIMPSON.

†*824/1. *POA CHAIXII* Vill. Banks of the river Tay among Rhododendrons, Kenmore, Mid-Perth, v.-c. 88, J. CHAPPLE.

824/7. *POA NEMORALIS* L. Abundant, Cwm Woods, Aberystwyth, and Devil's Bridge, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE. Add to *Comital Flora*. Previously given in *List of Welsh Flowering Plants* but bracketed by Salter, *Flowering Plants and Ferns of Cardiganshire*, "occurrence probable but needs confirmation."

†826/1. *BROMUS MAXIMUS* Desf. Roadside between Porchester and Fareham, S. Hants, v.-c. 11, P. M. HALL.

†827/8. *BROMUS RUBENS* L. Dagenham, S. Essex, v.-c. 18, compared at Kew, J. P. M. BRENNAN.

827/19b. *BROMUS HORDEACEUS* L., var. *GLABRATUS* Druce. Salisbury, S. Wilts, v.-c. 8, H. J. GODDARD. Det. C. E. HUBBARD.

827/19(2). *BROMUS LEPIDUS* O. R. Holmberg. Near Antony, *W. Cornwall, v.-c. 1; Belstone, *N. Devon, v.-c. 4; Kingston, *Dorset, v.-c.

9; roadside at Hothfield Heath near Ashford, *E. Kent, v.-c. 15; roadside at Beltring, W. Kent, v.-c. 16, June 1933, J. P. M. BRENNAN.

*827/19(2)b. *BROMUS LEPIDUS* Holmberg, f. *lasiolepis* Holmb. Marchwood, S. Hants, v.-c. 11, N.C.R. for species, H. J. GODDARD.

+829/6. *LOLIUM RIGIDUM* Gaud. Avonmouth Docks, v.-c. 34, June 1934, C. I. and N. Y. SANDWITH.

+835/4. *HORDEUM HYSTRIX* Roth. (*GUSSONEANUM* Parl.). Rubbish tip, Bristol, 1927; St Philip's Marsh, Bristol, v.-c. 34, 1916 (recorded in *Adventive Fl. Port Bristol* as *H. marinum*); Avonmouth Docks, W. Gloucester, June 1935, all records by C. I. and N. Y. SANDWITH.

*836/3. *ELYMUS EUROPAEUS* L. Denham, Middlesex, v.-c. 21, C. E. MARKS.

844/2×5. *EQUISETUM ARVENSE* L. × *LIMOSUM* L. (*E. LITORALE* Kühlew). Is proving to be quite common in Ireland, having been recorded already from 19 v.-cs., mostly in the form f: *elatus* Milde, R. L. PRAEGER.

844/8. *EQUISETUM TRACHYODON* Braun. Is widely spread in Ireland, and has been recorded from 16 v.-cs. from Kerry to Londonderry, and Dublin to Mayo, R. L. PRAEGER.

*844/9d. *EQUISETUM VARIEGATUM* Schleich., var. *ARENARIUM* Newm. Very abundant on burrows between Kidwelly and Pembrey, Carmarthen-shire, v.-c. 44. Apparently a N.C.R. as 44 is not given in *Comital Flora*, *Top. Bot.*, or either *Supplement*, and the *List of Welsh Flowering Plants* does not include the Pteridophyta. We did not see this species at Kenfig, Glamorganshire, where it is replaced by a procumbent form of *E. palustre*; plentiful on sandhills, Ynys Las, near Borth, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE.

851/9. *ASPLENIUM SEPTENTRIONALE* Hoffm. Rock crevices of Minto Crags, Roxburgh, v.-c. 80, Miss P. LEAKE.

854/3. *POLYSTICHUM ACULEATUM* Roth. Near a stream, Minto Glen, Roxburgh, v.-c. 80, Miss P. LEAKE.

856/2×3. *DRYOPTERIS CRISTATA* (L.) A. Gray × *D. SPINULOSA* Kuntze = × *D. ULIGINOSA* Kuntze. Three specimens seen at Hickling, E. Norfolk, October 1934, J. E. LOUSLEY. N

856/11. *PHEGopteris ROBERTIANA* Braun. Has been found in N.E. Galway on limestone, previously unknown in Ireland, R. L. PRAEGER.

*859/1. *CETERACH OFFICINARUM* L. One plant growing in the crevice of an old wall near Campbeltown, Argyll, v.-c. 101, frond sent to Secretary, LATIMER McINNES.

863/1. HYMENOPHYLLUM TUNBRIGENSE (L.) Sm. Plentiful with *H. peltatum*, Devil's Bridge, Cardiganshire, v.-c. 46, P. M. HALL and W. A. SLEDGE. Add to *Comital Flora* but already recorded "rare" in Salter's *Flowering Plants and Ferns of Cardiganshire*.

866/1b. OPHIOGLOSSUM VULGATUM L., var. POLYPHYLLUM Braun. Lundy Island, N. Devon, v.-c. 4, July 1935, Dr F. R. E. WRIGHT.

869/2. ISOETES ECHINOSPORA Dur. Llyn Fach, Glamorgan, v.-c. 41, Miss THOMAS per E. VACHELL. Det. W.H.P. Both this species and *lacustris* have been recorded from this water, but have not been found for some years, W.H.P.

*872/6. NITELLA MUCRONATA Miquel. R. Cuckmere, Alfriston, E. Sussex, v.-c. 14, J. E. LOUSLEY.

*876/7b. CHARA CONTRARIA Kuetz., var. HISPIDULA Braun. Cahir R., near the Bridge, Clare, v.-c. H. 9, N. D. SIMPSON.

876/11. CHARA ACULEOLATA Kuetz. (C. POLYACANTHA Braun). Wicken Lode, Cambridge, v.-c. 29, det. W.H.P., Mrs MACALISTER HALL.

*876/16. CHARA FRAGILIS Desv. Castle Howard, N.E. Yorks, v.-c. 62, given for N.W. Yorks, v.-c. 65, in *Brit. Charophyta*, ii, 63, Mrs E. M. MACALISTER HALL. Det. W.H.P.

876/17. CHARA DELICATULA Ag. Mynydd-y-glew, Glamorgan, v.-c. 41, Mrs E. M. MACALISTER HALL. Det. W.H.P.

THE IVEL DISTRICT OF BEDFORDSHIRE.

J. E. LITTLE, M.A.

[I had promised Mr Little to publish this paper as a necessary complement to that on "The Botany of the Ivel District of Hertfordshire" in the B.E.C. 1932 Rep., 375-387 (1933), but his lamented death last January left it unfinished. However, by the help of his friends, including E. F. D. Bloom, M.A., B.Sc.; T. B. Blow, F.L.S.; Chas. Crouch; T. A. Dymes, F.L.S.; A. W. Guppy; Reginald L. Hine, F.S.A.; Mrs E. Macalister Hall; Richard Morse, F.L.S.; Hugh Phillips; and the late Francis Ransom, F.C.S., who have supplied additional information or read through the MS. in draft, it has reached its present form. To his daughter, Miss Katharine D. Little, who has acted as secretary to the work, and to all who have so willingly collaborated in its completion, our warmest acknowledgments are tendered.—Ed.]

BOUNDARIES.

The district of Bedfordshire drained by the River Ivel and its tributaries—No. 4 in *V.C.H.Beds*, see (23)—is considerably larger than the portion of Hertfordshire included in its basin.

Starting from Stotfold, just outside the latter county, and working eastwards and northwards, we find that it touches the following townships:—Edworth, Potton, Everton, Tempsford, Blunham (where the Ivel enters the Ouse), Morhanger, Warden, Clophill, Tingrith, Eversholt, Toddington, Sundon, Streatley, Barton-in-the-Clay, Higham Gobion, and so follows the Herts border back to Stotfold.

It will be convenient, as frequent reference will be made to the Herts and Beds areas, to coin two names, viz., Southivel for the Herts area (Herts District No. 2), dealt with in B.E.C. 1932 Rep. (1933), and Northivel for the Beds area (Beds District No. 4), now under consideration.

GEOLOGY.

Northivel includes a part of the chalk scarp, the gault plain to the north of it, and a portion of the greensand belt roughly parallel to the chalk from W.S.W. to E.N.E., and a small exposure of Oxford Clay.

Through the greensand the Ivel cuts its way northward at Sandy Gap, and this lower portion of its course is chiefly bordered by alluvial land. Sandy Gap has determined the route of the L.N.E. Railway.

The "Lower Chalk" of older writers includes the Middle Chalk, i.e., all below the Chalk Rock (cf. J. E. Lobley "Cretaceous Rocks of England," *Trans. Watford Nat. History Socy.*, Vol. I, p. 13), so that when Jas. Saunders (28) says of *Senecio integrifolius* "apparently limited to the Lower Chalk escarpment" the term must be understood with this qualification. The plant occurred near Galley Hill, Streatley,

1929, at an altitude of 600 feet, right up to the Chalk Rock (E. F. D. Bloom).

The solid Geology is, however, masked by various deposits, such as: (1) Clay-with-flints, a deposit possibly of glacial origin, derived partly from the Chalk by solution of the lime content and partly from Tertiary beds. The relative proportions of clay and flints vary considerably in different localities. (2) Boulder clay and gravels ultimately due to the Ice-age. (3) More recent mixture of soils due to downwash from the hills particularly affecting the gault plain, on the south from the chalk scarp, and on the north from the Greensand.

THE NAME IVEL.

The river-name Ivel is considered to be pre-Saxon by E. Ekwall (39), who states "Gifla (gen. pl.), circa 1150, is not really the name of the river itself, but the name given in the Tribal Hidage to the people who dwelled by it" (K. and E.M.H.). "That river name, however (Givle, circa 1250), is certainly the source of the territorial name given above" (*E.P.N. Beds*, pp. xviii, p. 8, 94). It is preserved in two place names of territorial signification: Northill (North-Ivel) and Southill (South-Ivel). In modern times the name Ivel is applied by general agreement to the lower course of the river between Langford and Blunham. But while the 1 in. O.S. map marks the stream from Baldock to Henlow as Ivel, Beds residents consider the longer arm, sometimes marked as Flitt, from Flitwick to Shefford and Langford, as better entitled to the name Ivel. An old map (Dury & Andrews' Herts, 1795) marked the Baldock water as Rhea, which, like the Ashwell feeder of the Cam called Rhee, represents the O.E. *aet there ea* ("at the water," becoming later "at the Ree"), so that Ree was taken for and became a proper name for a river, as in numerous other examples.

The western tributary, the "Flitt," and the nameless eastern tributary from Hatley and Potton formerly had adjacent to them considerable areas of marshy ground in which peat was formed, but these, owing to drainage and other causes, have vanished with the exception of Flitwick Moor, where peat is still being dug for commercial purposes.

FLITWICK MOOR.

This interesting relic of once much more extended peat-bogs is still worth visiting. In 1896 Arthur and Gulielma Lister, with Charles Crouch and James Saunders, recorded 36 species of *Mycetozoa* (18, 19, 20), but Charles Crouch (*in litt.* to J.E.L.) notes that on August 28, 1928, he could only find a single plasmodium.

In 1926 R. Morse (37) listed over 100 species of Flowering plants, among them being *Potentilla palustris*, which is also known to C. Crouch on Westoning Moor (17). C. Crouch also records *Viola palustris* for these two stations in 1930.

POTTON MARSHES.

The (nameless) eastern lateral feeder of the Ivel had upon it 150 years ago an area called by C. Abbot (1, 2) Potton Marshes. For this

station he records a number of bog-plants which have since become extinct, as *Vaccinium Oxyccocos*, *Utricularia minor*, *Schoenus nigricans*.

Along the watercourse between Potton and Sandy (on Biggleswade Common) is still an interesting hunting ground for marsh and aquatic plants. This small stream has upon it at Sutton an old packhorse bridge, dating from the XIVth century (23), built, like many of the churches in the district, of local stone obtained from harder bands in the greensand. It is still in excellent order. The bridge is too narrow for any wheeled traffic, and the road still crosses the stream by a splash or ford alongside the bridge. The bridge has two arches, and my brother, J. W. Little, as an architect, on seeing the photograph of it at once asked why two arches should be necessary on a stream of such small present volume. The answer to this question may perhaps lie in a consideration of former conditions. At the time of Domesday Survey (1086), there was a mill "in Hatelai" (Hatley Cockayne) worth 18/- and one in Potton worth 5/- per annum (23). Sutton was South-tun in Potton. These suggest a larger and more constant flow of water than at the present time, coming from the gault and boulder-clay area higher up.

The natural condition of the gault and boulder-clay area in still earlier time would be forest. Two small woods still existing, viz., Potton Wood and Hatley Wood, illustrate the soil conditions. Potton Wood drains towards Gamlingay and so into the Ivel. Hatley Wood apparently drains into the Rhee and Cam (23). In April 1932 the water lay all over the wood, filling the wheel tracks in the ridings, and standing several inches deep in small depressions. Gamlingay Wood (Cams) on the opposite side of the valley was in the same state in April 1927 and the ecological conditions were similar. The water hangs all the winter on the surface of the unabsorbent clay and slowly finds its way into the water courses.

The traces of a dam across the valley below Warden Abbey suggest that this was the site of a mill appendant to the Abbey. The stream draining out of Warden Great Wood is now insignificant, but there are near the site of the Abbey various ponds, which may have been used in connection with the larger millhead to store fish for monastic fast-days. The stream still supplies the water for the Lake in Southill Park, the largest piece of water in the neighbourhood.

To come back to our Packhorse Bridge at Sutton, there seems to be adequate evidence of a much larger flow of water in the streams of our district in mediaeval times, and this together with increased liability to flood off the assarted clay lands may explain why two arches were necessary when the bridge was built.

The larger watercourses of Northivel produce marsh plants and aquatics absent or rare in the upland streams of Southivel, as *Ranunculus pseudo-fluitans*, *Symphytum officinale*, *Scutellaria galericulata*, *Potamogeton perfoliatus*, *Scirpus lacustris*.

At the heads of two small springs rising in the Lower Chalk at Cadwell, watercress is cultivated, as in our Hertfordshire portion.

NORTHIVEL.

Northivel affords for our district an opportunity of contrasting the flora of the chalk with that of the greensand. On the latter are to be found arenicolous plants absent in Southivel. Such are *Corydalis claviculata*, *Teesdalia nudicaulis*, *Erodium pimpinellifolium*, **Ornithopus perpusillus*, *Potentilla argentea*, *Vicia lathyroides*, *Jasione montana*, *Hypochaeris glabra*, *Arnoseris pusilla*, *Carex Pairaei*. On the greensand the orchids so abundant on the chalk scarp are very scantily represented. This distinction is of great value locally, but one may quote a remark by M. Ch. Flahault (22) to show that it must not be presumed to be everywhere of general value. He says: "Beaucoup d'espèces considérées au nord des Cévennes comme calcicoles se trouvent dans le domaine méditerranéen sur tous les sols." . . . "Elles ne sont donc pas calciphiles." "Telles sont: *Clematis Vitalba*, *Helianthemum vulgare*, *Cirsium eriophorum*, *Juniperus communis*, *Helleborus foetidus*." . . . "On a de bonnes raisons de penser que les plantes qui prospèrent sur les sols calcaires s'y trouvent comme les espèces halophiles dans les terrains salés, qu'elles supportent le calcaire et qu'elles y occupent une place d'autant plus grande, qu'elles ne sont pas en lutte avec des espèces plus fortes. Il n'y aurait donc pas de plants calciphiles mais seulement des plantes calcicoles et des espèces calcifuges, trouvant asile dans des sols dits silicieux par la nécessité d'échapper aux effets funestes du calcaire."

The five species hereabove quoted are calcicolous in our area, although *Cirsium eriophorum* is now extremely rare, perhaps owing to close trimming of hedgerows. It does, however, occur also in Northivel on non-calcareous soil.

As an example of a plant with us calcifugous, and perhaps much more widely also, we may take the Foxglove, which is entirely absent from Southivel. It is, so far as I know, also absent in Northivel, but occurs on the greensand at Aspley just outside our area.

PRESENT DAY ASPECT.

The former aspect of Northivel has been so transformed, on the one hand by plantations of Conifers especially on the Greensand, and on the other by close cultivation for market gardening purposes, that few even semi-natural areas remain to indicate what was once its predominant character; and we must draw our conclusions from a few floral "islands" scattered along the outcrop of the Greensand from Ampthill to Potton and isolated like coral-atolls in an ocean of cultivation.

The market gardening area, originally centered round Sandy and Biggleswade, and looking to the railways for transport of its produce, has during the last 20 years gradually extended much more widely and, so far as the growing of vegetables like Brussels Sprouts is concerned, has now spread into Southivel. To this extension several causes have contributed. (1) By too continuous cropping without sufficient change,

*Now hard to find at Maulden, crowded out by perennial vegetation as in the two localities at Millbrook (C. Crouch).

the land first utilised has become subject to diseases (F. H. Davis). (2) Land further away can be obtained at a lower rent. (3) Conveyance in lorries from the farms by road has largely taken the place of rail transport, and it is no longer necessary that the land should be near a railway. There has also been much ribbon development of houses on certain roads, as between Clophill and Ampthill. The result of these changes has been an extensive obliteration of the former natural or semi-natural flora.

EARLIER ASPECT.

As soon as settlement began, and clearance of the ground for agriculture, there would be increased liability to flood.

Even so far back as the reign of Ine, King of the West Saxons, it had become necessary to regulate the clearance of forest. And although the Laws of King Ine (circa 690 A.D.) do not directly apply to our area, which at that time may have been under Anglian or East Saxon rule, they illustrate the conditions under which settlement was proceeding.

Two clauses given in Sweet's Anglo-Saxon Reader, dealing with what may be called early forest law, are here translated:—

43. "Of burning of forest."

"If a man burn down a tree in woodland, and it become known who did it, let him pay full penalty: let him pay LX shillings, since fire is a thief."

"If a man fell in woodland very many trees, and be afterwards detected, let him pay penalty for iii trees, each at XXX shillings. Nor shall he pay for more of them, however many they be, because *the axe is an informer* and not a thief." [Fire, a thief, working secretly. The axe, an informer, working openly and announcing itself by the sound.]

44. ("Of timber obtained without leave.")

"If a man fell a tree under which XXX swine can stand, and it be discovered, let him pay LX shillings as penalty."

ASSARTS OR ESSARTS.

This term was in use after the Norman Conquest to denote clearings of waste or forest land. That they were still going on in the thirteenth century is shown by Cottonian MSS., *Nero E.VI*, fol. 131b. (in Brit. Mus.), where is made mention of them in the neighbourhood of Audebury (Aldbury, near Tring, Herts). And another document in the same *Nero E.VI* concerns an agreement between Almeric, Master of the Temple, and Mabel, Abbess of Elstow, respecting tithes in Hitchin in 1286 A.D., "exceptis Essartis de quibus ipsii Templarii decimus hucusque tenuerunt."

Assarts are mentioned in documents connected with the foundation of the Cistercian Abbey of Warden, Beds.* It was called "St Mary *de Sartis*" (St Mary of the Assarts).

*Those who wish to gain fuller information should consult Dr G. Herbert Fowler's recent work, *Cartulary of the Abbey of Old Warden*, Oct. Beds. Hist. Record Soc., xiii, whole volume (R.L.H.).

Two passages from *V.C.H. Beds* (23) are here given:—

“ The original endowment of the Abbey comprised all the assarts of Warden and Southill with the wood between these two villis, with permission to cut what wood was wanted for the use of the monastery, and including pannage and herbage, etc., granted by Walter Espec; also the church of Old Warden, and part of the wood of Middleho which the Abbot of Ramsey granted. These grants were confirmed by Stephen, Henry II, and Richard I, and Henry III added the right to assart or enclose the wood of Middleho, Hunts ” (*V.C.H. Beds*, I, 364).

“ Rowney apparently formed part of the original grant of Walter Espec to Warden Abbey, consisting of those woodlands which overlapped from Old Warden into Southill, for Rowney Grange was named among the possessions of Warden Abbey in 1198.” . . . “ A grant of free warren in the woods belonging to Rowney Grange was made to Warden Abbey in 1252 ” (*V.C.H. Beds*, III, 259).

Pannage was the right of swine-pasture in the woods, and implies the presence of oak-wood. In D.B., 1086, Southill had woodland sufficient to feed 200 swine.

PLACE NAMES.

A few names connected with former conditions (of vegetation) may here be given (38):—

Broom: In D.B., 1086, *Brume*. So called from the abundance of the broom.

Eversholt: “ Boars’ Wood.”

Furzdon Hall: 1 in. O.S., 1835. On Biggleswade Common.

Gravenhurst: O.E. “ Wooded hill of the grove or thicket.”

Loswode (temp. Henry II): in Warden. “ Wood of the swine.”

Moggerhanger (Morhanger): O.E. *hangra*, a wood.

Rowney: from O.E. *ruhan* (ge) *haege* (in dative), “ rough enclosure.”

Ruxox: in Flitwick. O.E. *Hroces-ac*. “ Oak of Rook.”

Watermill Bridge: 1 in. O.S. 1 mi. S.W. of Sutton.

Millhouse Fen: in Sutton, near Portobello Farm. There is still a wood with reed-swamp.

Wilbury, in Stotfold: O.E. *Wiligbyrig* in 1007. “ At the burh of the willow.” An old settlement of the Iron Age was discovered in 1932 at Wilbury Hill (W. H. Lane).

Other interesting place names are:—

Gamlingay Bogs: Cambs. (1 in. O.S., 1835), now vanished. Probably Abbot’s *Potton Marshes* was a continuation of these within the Beds border.

Conger Hill: in Toddington M.E. *conynger*, “ rabbit warren.” cf. *Congigree Wood*, now stocked up, in Tithe Map of St Ippolyts, Herts.

Holme (Mills): near Biggleswade (O.N. *holmr*, Dial. *holm*, “ piece of low-lying ground by a river or stream.” cf. Portholm, Huntingdon.

Brache or *The Braches*: 2 miles N. of Sandy. (1 in. O.S. 1835). This appears in Cott. MSS. *Nero E.VI*, fol. 131d, as "unam carucatam terre scilicet triginta acras in *Labrache*." Date—after the suppression of the Knights Templars in 1307.

There was also a Breach in Maulden ("Are Brache") in 1307. Cf. also Breachwood Green, Herts; and Brach Farm, near Luton.

These derive from:—*Breac*, *Braec* O.E., Dialect *Brach*, *Breck*. (1) Strip of uncultivated land. (2) Strip of land taken from a forest by royal licence, for temporary cultivation. The cognate O.E. verb, *brecan*, to break, shows that the dominant idea was that the land had to be broken up. This is exemplified in the "Breck" lands of Norfolk and Suffolk, where land was taken for temporary cultivation, and then went back to waste until it recovered from the cropping.

In the 1885 1 in. O.S. appear between Sandy Heath and The Hasells North of the Long Riding, five cultivated strips each surrounded by long "belts" of plantation. In recent O.S. maps the 4 intermediate belts have disappeared, leaving only the 4 external ones.

As in the Norfolk and Suffolk brecks, the light soil was presumably liable to be blown away by strong winds. Hence the need at first for protective belts. In 1911 I saw the sand rising in clouds under horse-harrowing near Sandy Heath.

Land thus temporarily broken up, and then left for some years to recover itself, affords in the latter stage an open association in the ecological sense, favouring such plants as *Arnosseris* and *Hypochoeris glabra*, etc., which are likely to disappear under more continuous cultivation. *Arnosseris* occurred in hundreds on a field at Sutton about 1928, where none was to be seen in 1932.

At Maulden in 1911 the wind had "blown out" a sand pit and distributed it over the adjoining field—after the manner of a "blow-out" on sand-dunes. On the new sand surface thus created were flourishing *Filago minima*, *F. germanica*, and *F. apiculata*. *Galinsoga parviflora* was growing in many hundreds in 1932 at Sutton on a sandy field cropped with runner beans.

TURBARY.

This was the right to cut turf or peat. ". . . *Et libertates in turbariis et brucriis*" (Cott. MSS. *Nero E.VI*, fol. 131d). Cf. the cutting of peat on Flitwick Moor already mentioned.

SANDY HEATH.

This in 1307 appears as "Bruera de Saunedey." A small portion still remains uncultivated. Bruera is represented by Mod. French *bruyère*, heath, from the Low Latin *Brugaria*. Compare Mod. English "Brier-wood pipes," made from the roots of a heath. The natural vegetation of Sandy Heath is composed of such plants as *Quercus Robur* (scrub), *Betula*, *Pyrus Malus*, *Sarothamnus*, *Ulex europaeus*, *Calluna vulgaris*, *Teucrium Scorodonia*, with abundance of *Deschampsia flexuosa*

and occasional *Carex pilulifera* and *C. Pairaei*. *Pteris aquilina* is abundant.

CHANGE IN THE DISTRIBUTION OF WOODLAND.

The oak wood of the neighbourhood of Warden is still represented by Warden Great Wood, Park Wood, and Sheerhatch Wood. Most of the rest has been cleared, and has been replaced by pasture and arable land. The change in the aspect of the Greensand has already been mentioned. It can therefore be said that there has been a considerable reversal of former conditions in the distribution of woodland.

About the year 1916, a considerable part of Rowney Warren, planted with coniferous trees, was felled for timber. Later, about 80 acres were replanted with Scotch Pine and European Larch. Sitka Spruce and Ash were also planted, but failed to survive the frosts.

An uncommon variation of the Oak (*Quercus Robur*, var. *fastigiata*) is planted in Southill Park in grass near the Pinetum Nursery. The branches are closely appressed to the main stem, and give the tree the aspect of a Lombardy Poplar. It is found wild in the valleys of the Western Pyrenees and on the Landes near Bordeaux (Loudon).

Castanea sativa, though not mentioned in Saunders, is not uncommon in plantations.

CLIMATE.

As an indication for Northivel of a milder climate in spring, *Crataegus oxyacanthoides* was observed in flower near Old Warden in 1912 about 10 days before any of the segregate was open in Southivel; and the Cowslips on the clay in this region are very much finer than those on the chalk. *Lamium hybridum* had in the same year entered on its entomophilous state at Southill earlier than in Southivel.

BEDFORDSHIRE BOTANISTS.

The county was fortunate in being one of the earliest for which a local Flora was published: the *Flora Bedfordiensis*, (1) by Abbot, issued in 1798. The Rev. Charles Abbot (circa 1761-1817), born probably at Winchester, was a Fellow of New College, proceeded M.A. in 1788 and took his B.D. and D.D. degrees in 1802. He was elected F.L.S. in 1793. In 1787 he became an Usher at Bedford Grammar School (now Bedford School) and in 1788 Vicar of Oakley Raynes, a few miles North of Bedford. It is said that he neglected his scholastic duties, devoting the majority of his time to his parish and to botanical studies; this caused him to be passed over as a candidate for the headmastership in 1810 at the death of Hooke.

He was in frequent communication with many of the eminent botanists of his time, among whom may be mentioned Dr (afterwards Sir) J. E. Smith, James Sowerby, and Thomas Martyn, professor of Botany at Cambridge (4).

The writer has a copy of the Flora, inscribed by the author in a beautifully neat quill-pen hand, "To Caleb Goodyear, Esqre., Guildford,

a mark of gratitude and esteem, from the author." And more fortunate still, he has had the opportunity of examining another copy, interleaved with numerous MS. notes, which from the handwriting and references to Mrs Abbot, as well as from numerous entries carrying on those of the printed work, is undoubtedly the author's own copy (1), embodying much additional matter, such as references to Sowerby added in ink, with a view to another edition. This, however, never reached publication, and so perhaps some allusion to the additions may be welcomed.

The author follows his own numbering, adding an asterisk to indicate where the addition is to be inserted.

Thus: "* 400. Corn Adonis. *A. autumnalis*. Sowerby 308 . . . St Leonards, Pickering. Obs., Mrs Abbot has often brought this elegant plant in from the cornfields and it would have been inserted in the body of the work, but from the suspicion of its not being indigenous." [A specimen of *A. autumnalis* (*A. annua* L., em. Mill) was brought to the writer from Pegsdon, 1930.]

Even the erasures are of interest. I find for instance the following entry, crossed out. "627. Yellow Mountain Pansy. *Viola lutea* . . . Luton Downs and Ford End. Mrs Abbot." *V. lutea* is a perennial mountain plant not occurring in Hertfordshire and Bedfordshire. Probably Mrs Abbot found the large-flowered sulphur-coloured annual segregate of *V. tricolor* L. now called *V. contempta* Jord., which occurs on arable land about Hitchin (det. E. Drabble).

Or again: "* 1220. Man Ophrys. *O. anthropophora* . . . Pertenhall, on the borders of Huntingdonshire, Rev. T. Martyn, P.B. (Professor of Botany). Obs., Helmet brownish." The observation suggests to us that the plant was perhaps *Habenaria viridis*, which Abbot does record in the body of the work as "635, Frog Satyrion, *S. viride*."

In the author's copy the plates, drawn upon copper by James Sowerby, have been hand-coloured in the same manner as in *English Botany*. (In the ordinary copies they are uncoloured). Some indeed, as *Viola palustris* Sowerby 444, are actually from the *E.B.* plates, with the *E.B.* numbers erased, and a serial number for the *Fl. Bedf.* substituted.

One, *Alchemilla vulgaris* (Abbot No. 1) was drawn for *E.B.* but not actually used. See Garry's Notes (24).

There are frequent MS. notes, such as "*Scirpus albus*" (= *Rhynchospora alba*), "one of Sowerby's desiderata"—or to "533. *Trifolium ochroleucum*. Sent July 1, 1800," obviously either to Smith or Sowerby.

Another entry is: "* 28. Compressed Bog Rush. *S. compressus* . . . Sowerby 791 . . . Bogs and meadows . . . Potton Marshes and Fenlake Bog." The species does not appear in Saunders (28), and now, although the record has only just been recovered, the plant must almost certainly be placed in the list of extinctions.

There is much additional information about Cryptogams, which it is hoped to submit to revision by specialists before it is published.

Whereas in Hertfordshire, at the close of the eighteenth century, there does not appear to have been any botanist taking part in Smith's work by contributing specimens, quite a number of plants were sent from

Bedfordshire, largely by Abbot, many of which were drawn for *E.B.* by Sowerby (24). Some examples from Northivel are here given:—

- E.B.*, Tab. 322. *Geranium phaeum*. Everholt [=Eversholt]. Rev. Chas. Abbot, Bedford.
- E.B.*, Tab. 902. *Erodium moschatum* L'Hérit. Ampthill Warren, Abbot. (See "Notes on particular species," post.)
- E.B.*, Tab. 1108. *Lathyrus latifolius* Hawnes (=Haynes) and Bromham. Rev. Dr Abbot. [This, fide R. A. Pryor, *Journ. Bot.*, 1881, was *L. sylvestris*].
- E.B.*, Tab. 840. *Euphorbia Cyparissias* L. Barton Leat Wood, August 30, 1799. Rev. C. Abbot.
- E.B.*, Tab. 72. *Malaxis paludosa* Sw. Bogs near Potton, July 27, 1792. By favour of Rev. C. Abbot.

The two following lists offer an instructive contrast between 1796 and 1935.—

I. Plants now common, noted as rare by the Rev. C. Abbot:—*Arabis Thaliana*, *Trifolium hybridum*, *Ilex Aquifolium*, *Sium angustifolium*, *Antirrhinum minus* (*Linaria minor*), *A. Cymbalaria* (*L. Cymbalaria*), *Betula Alnus* (*Alnus rotundifolia*). It is noteworthy that C.A. makes no mention of the Hornbeam as a Bedfordshire tree, and considers the Holly and the Alder rare.

II. Plants now rare, noted as common by the Rev. C. Abbot:—*Ranunculus parviflorus*, *Lathyrus sylvestris*, *Prunus Cerasus*—see Hamson (26) and Saunders (28), *Pimpinella major*, *Sambucus Ebulus*, *Serratula tinctoria*, *Carduus eriophorus*, *Melampyrum cristatum*, *Chenopodium murale*, *Pedicularis palustris*.

The Rev. W. Crouch (1818-1846), of Cainhoe, was for a time curate in charge of Lidlington, and died in July 1846, aged 28.

In his Herbarium (6), a plant under the name of *Veronica agrestis* L. from Cainhoe, 1843, is in fact *V. persica* Poir., var. *Tourn.*, and appears to be the first record in the county for the latter species. True *V. agrestis* L. occurs at Luton and Aspley Guise, but has not been seen in District No. 4 in Beds, though it may very well occur on suitable ground. Saunders calls *V. agrestis* common, following Abbot, but it is certainly not so now, and has been confused both with *V. polita* Fr. and *V. persica* (45).

Pedicularis palustris, recorded for Bogs at Gravenhurst, 1842, by the Rev. W. Crouch, is now extinct there. It survived until about 1912 at Walsworth, Herts, but there also is now probably extinct.

John Hamson (1858-1930) was born at Naseby on September 11, 1858, and died at Malvern on June 4, 1930. He was for many years sub-editor of the *Beds Times and Independent* and during that time kept records of Bedfordshire plants, incorporating therein all the previous matter collected by the old Bedford Natural History Society, W. Crouch, C. Crouch, J. McLaren, E. M. Langley, J. Saunders, etc. His

manuscripts, bound in five volumes, passed to the Bedford Natural History and Archaeological Society, and are still being dealt with (1936) by A. W. Guppy, of Bromham, Bedford. He wrote *An Account of the Flora of Bedfordshire* (25) which was published by the Beds. Times Publishing Co. in April 1906, but now scarce and out of print.

Arthur Lister (1830-1908), F.R.S., brother of Joseph (Lord) Lister, was with his brother at school at Hitchin under Isaac Brown. (J. V. Lister, jun. Obituary Notice of A.L., *Proc. of Royal Socy.*, 1915.)

James Saunders (1839-1925), A.L.S., the eldest son of James and Louisa Saunders, was born at Salisbury on March 30, 1839, and died at Luton on April 16, 1925, aged 86. Being settled at Luton, he made contributions to the *Transactions of the Bedfordshire Natural History Society* for 1881, "On the Wild Flowers of S. Beds" (13), and for 1882, "Characeae in Beds" (14). He also sent articles to the *Journal of Botany* for 1883, 1884, 1889. These articles were in 1911 brought together, with additional matter, in a volume entitled *The Field Flowers of Bedfordshire* (28), collating, so far as was known to the author, the work of previous botanists, such as C. Abbot, W. Crouch, A. R. Pryor, W. Hillhouse, James McLaren, E. M. Langley, and John Hamson. It is pleasant to know that he presented a copy of this work to every school in Bedfordshire. No division of the county into districts was attempted, though Saunders had expressed a preference for two divisions, North of the Ouse and South of the Ouse. Both Saunders and Hamson were contributors to *V.C.H.Beds* (23).

Saunders' collection of Mycetoza is housed at St Albans Museum, his Characeae at South Kensington, and his Herbarium at Luton Public Library.

The following records for Bedfordshire District No. 4—Northivel—were not included in Saunders' *Field Flowers of Bedfordshire* (28) and are also subsequent to the writer's notes in the *Journal of Botany* (34).

Saunders (28).	NEW TO BEDS DISTRICT, NO. 4.
PAGE	I. Native.
12.	<i>Arenaria tenuifolia</i> . Barton Hills, 1928, Richard Morse. 1930, J.E.L.
18.	<i>Lotus tenuis</i> Waldst. & Kit. Pegsdon, 1925, J.E.L.
34.	<i>Adoxa Moschatellina</i> . Near Lilley Hoo, in Beds, 1931, J.E.L.
42.	<i>Hieracium sciaphilum</i> . Railway, near Snailwell, Holwell, 1913, J.E.L.
43.	<i>Taraxacum palustre</i> . Southill, 1913, J.E.L.
45.	<i>Primula elatior</i> Jacq. Potton Wood, 1934, H. and D. Meyer !.
57.	<i>Chenopodium ficifolium</i> . Arlesey, 1923, J.E.L.
58.	<i>Polygonum lapathifolium</i> L., auct angl. Sandy Warren, J. of Bot., 1913; Rowney Warren, 1924; Flitwick, 1925; Chicksands, 1921; Campton, 1921, J.E.L.
	<i>P. maculatum</i> . Campton, 1921; Rowney Warren, 1924, J.E.L.

59. *Rumex palustris* Sm. Pond near Warden Abbey, 1913, J.E.L.; confirmed C. E. Moss.
60. *Euphorbia platyphyllos*. Waste and Farmyard, Hatley Cockayne, 1931, Miss M. Brown and J.E.L.; but Charles Crouch records a garden specimen from Eversholt in 1894.
61. *Ulmus minor* Henry non Mill. Near Stondon Vic, 1925 (B.E.C. Rep., 1925, p. 894, as *U. Plotii* Druce).
U. nitens Moench. Chicksands, 1921, J.E.L.
64. *Neottia Nidus-Avis*. Cainhoe Park Wood, 1843, W. Crouch. Malt-
ing Spinney, Ridgmont, 1917-19, C. Crouch.
71. *Potamogeton panormitanus* Biv.-Benn. Southill Park Lake, 1913
(See B.E.C. Rep., 1920, p. 152).
73. *Carex Pairaei*. Sutton, 1924, J.E.L.
73. *Carex pallescens*. Warden Great Wood, 1924, J.E.L. Cainhoe
Park Wood, C. Crouch.
83. *Equisetum maximum*. Southill Park, 1930, J.E.L.
84. *Chara fragilis*. Southill Park Lake, 1928, J.E.L.; det. T. B. Blöw.

II. *Aliens*.

6. *Barbarea intermedia*. Near Beacon Hill, Pegsdon, 1931, J.E.L.
6. *Sisymbrium pannonicum*. Brickyard between Henlow station and
Shefford, 1930, J.E.L.
6. *Erysimum orientale*. Ampthill, 1922, C. Crouch.
7. *Malcolmia africana*. Arlesey, 1911, J.E.L.
8. *Lepidium Draba* L. R. Long's Brickworks, near Henlow station,
1920, J.E.L.
29. *Oenothera biennis*. Maulden, 1931, J.E.L.
38. *Galinsoga parviflora* Con. Galley Hill Sutton, J.E.L. and M.
Brown.
Matricaria suaveolens Buch. Hatley Cockayne, Flitwick, Ampthill,
Harlington, C. Crouch.
43. *Lactuca virosa*. S.W. of Caldecote, 1925; Pit between Henlow
station and Shefford, 1930, J.E.L.
49. *Amsinckia Menziesii*. Biggleswade, 1922, Miss M. C. Williams !.
51. *Mimulus moschatus* D. Biggleswade, 1922, Miss M. C. Williams !.
78. *Cynosurus echinatus*. Cobbler's Wood, Ridgmont, 1921; Ampthill,
1922, 1926, C. Crouch.

NOTES ON PARTICULAR SPECIES.

PRIMULA ELATIOR Jacq. in Beds.—Attempts have been made by the writer to discover the true Oxlip (*P. elatior* Jacq.) within the borders of the district. In the E. several woods are of a character very similar to Gamlingay Wood, just over the Cambs border. They lie on the top of gentle elevations and are more or less flat and covered with scrub in which aspen and willow are abundant. In winter the water lies in all the folds of the tenacious boulder clay, so that even in the ridings of the woods progress is only possible by wading through the standing water. The geological and ecological conditions so well match those a

few miles away over the border, where *P. elatior* does occur, that it would not be surprising if further search were to establish its presence in this corner of Bedfordshire.

Potton Wood and Hatley Wood lie on the top of a gentle rise. Both are above the 200 foot contour. Potton Wood drains down towards Gamlingay (Beds 4); Hatley Wood is uncertain, but at one corner may drain into Cam (Beds 5). Both lie within the boulder clay area as delimited by Dr Whittaker in the map accompanying Miller Christy's paper (36), but the latter writes: "Along the southern boundary line of the Oxlip area I know of no outlying localities for the species and I believe that none such exist," and his delimitation of the areas of *P. elatior* Jacq. does not include Beds, although he agrees that *P. elatior* of Oeder's *Flora Danica* (Pl. 334), quoted by Abbot, does represent *P. elatior* Jacq. A. R. Pryor (*J. Bot.*, 1876 and 1881) and Saunders (28) both considered that Abbot's *P. elatior* was the hybrid. Saunders (28), while admitting *P. veris* × *vulgaris*, excludes *P. elatior* Jacq. Abbot had noted *P. elatior* as "common," but even the hybrid, though well recorded, can hardly be said to be "common" in Beds. (Stanfordbury Farm, near Shefford, 1912, and Hatley Cockayne, 1932, J.E.L.; near Potton, H. Meyer, 1934). Abbot's record is possibly responsible for the inclusion of *P. elatior* Jacq. in Suppl. to *Watson Top. Bot.*, repeated in Druce's *Comital Flora* (460/1). Hooker (*Stud. Fl.*, 1883) gives Beds as one of his four counties.

It is, therefore, satisfactory to record that in May 1934 six plants of *Primula elatior* Jacq. were found by Harry and Doris Meyer (Letchworth) near the head of a small watercourse draining out of Potton Wood, Beds, in district 4. (*Vidi* J.E.L.) This clears up a doubtful point. *P. elatior* × *vulgaris* was growing with the oxslips and hybrids such as *P. veris* × *vulgaris*. *P. ? vulgaris*, var. *caulescens*, was also present in another part of the wood. At that time Potton Wood was comparatively dry.

Water colour drawings of *P. elatior* and hybrids were made by Doris Meyer.

Primula elatior is called by Hooker and Coste inodorous, but at Stansfield, Suffolk, where it grows in great abundance, the plants have a distinct scent, differing both from that of *P. vulgaris* and *P. veris*. This fragrance was also noted in the Potton specimens.

ERODIUM MOSCHATUM L'Hérit. *E.B.*, tab. 902, 1st ed. (963, 3rd ed.) and *ERODIUM CICUTARIUM* L'Hérit. *E.B.*, tab. 1768, 1st ed. (962, 3rd ed.).—F. A. N. Garry in his "Notes" (24) makes, I think, no comment on these two plates. Yet, on examining them in the 1st edition, a few years ago, one could not help feeling some doubt about the details on the plates. Tab. 902 was drawn from material supplied by Dr Abbot from Ampthill Warren, Beds. (*E. moschatum* has again been recorded for Beds., but not as native.) Tab. 1768 shows for *E. cicutarium* fertile stamens on filaments which are more decidedly dentate (this detail is omitted from the figure in Syme *E.B.*, 307, and is inconsistent with

the description) at the upper edges of their enlarged bases than in those drawn for *E. moschatum*, tab. 902; but in the description the stamens of *E. cicutarium* are characterised as "simple." The stipules are drawn as lanceolate acute, though in the description they are called ovate or acute.

Ascherson & Graebner (*Fl. n.-o. d. Flachl.*, 461), however, say for *E. cicutarium*: "Fruchtbare Staubfäden aus breiterem, meist nicht gezähntem Grunde plötzlich verschmälert," as if they had experience of occasional actual dentation, which is unknown to me in *E. cicutarium*, although there is considerable variation of abrupt or gradual dilation.

Ascherson and Graebner make no mention of one valuable permanent character of the carpel, viz., that in *E. moschatum*, the subapical pits are glandular but in *E. cicutarium* are eglandular (Hooker & Babington). There is, as between *E. cicutarium* and *E. moschatum*, a difference in the angle at which the two subapical pits converge—more acute in *E. moschatum* and more obtuse in *E. cicutarium*.

Erodium cicutarium.

Ascherson & Graebner have the following arrangement in *Fl. n.-o. d. Flachl.*, 461:—

- A. *holoporphyreum* (E. H. L. Krause in *Prahl Krit. Fl.*, 38, 1889).
Blättchen fiederspitzig, mit eingeschnitten *spitz-gezähnten* Abschnitten; Blüten *homogam*, kleiner; Blumenblätter ziemlich gleich, ungefleckt.
- B. *pimpinellifolium* (E. Willd.).
Blättchen eingeschnitten, *stumpfflich-gezähnt*; Blüten *proterandrisch*, grösser; Blumenblätter auffällig ungleich, die zwei oberen Blumenblätter mit *einem*, selten zwei oder vier, gelblichen bis dunkelgrauen Flecken.

B., the proterandrous plant, is described and figured by Hermann Müller (*Fertilisation of Flowers*, Translation 1863). He found it visited by hive bees, and Sprengel by humble bees, collecting pollen. But, failing insect visits, the plant is capable of self-fertilisation like A.

In Northivel what appears to correspond to A. (*E. cicutarium*, var. *vulgatum* Syme?) is found on chalk or gravel or sand; near Tingley Wood (chalk); near Wayting Hill, but within the Beds border (gravel); near Rowney Warren and Clophill (sand).

E. pimpinellifolium Sibth., corresponding to B., is found on sand—at Sutton, 1913-32; Sandy, 1924. It is apparently limited to sand, as in the other counties, e.g., Parkstone, Dorset (J.E.L.), and Oakhanger, Hants (J.E.L.).

MYCETOZOA.—Species of Mycetoza collected September 8, 1896, in Folly Wood, Flitwick Moor, Beds, by Arthur and Gulielma Lister, James and Edgar Saunders, and Charles Crouch. (C.C. in *litt.*, 10th June 1931).

<i>Ceratiomyxa mucida</i> Schroeter.	<i>Didymium effusum</i> Link.
<i>Badhamia hyalina</i> Berk.	<i>D. crustaceum</i> Fr.
<i>B. lilacina</i> Rost.	<i>D. Serpula</i> Fr.
<i>B. panicea</i> Rost.	<i>D. Clavus</i> Rost.
<i>B. macrocarpa</i> Rost.	<i>Spumaria alba</i> DC.
<i>B. utricularis</i> Berk.	<i>Diachaea elegans</i> Fr.
<i>Physarum nutans</i> Pers.	<i>D. subsessilis</i> Peck.
<i>P. bivalve</i> Pers.	<i>Comatricha obtusata</i> Preuss.
<i>P. Diderma</i> Rost.	<i>C. rubens</i> Lister.
<i>P. contextum</i> Pers.	<i>Lamproderma irideum</i> Mass.
<i>P. conglomeratum</i> Rost.	<i>Dictydiaethalium plumbeum</i> Rost.
<i>Leocarpus vernicosus</i> Link.	<i>Arcyria albida</i> Pers.
<i>Craterium pedunculatum</i> Trent.	<i>A. flava</i> Pers.
<i>C. mutabile</i> Fr.	<i>A. incarnata</i> Pers.
<i>C. leucocephalum</i> Ditm.	<i>Trichia persimilis</i> Karst.
<i>Chondrioderma reticulatum</i> Rost.	<i>T. varia</i> Pers.
<i>C. testaceum</i> Rost.	<i>T. fallax</i> Pers.
<i>C. spumarioides</i> Rost.	<i>Lycogala miniatum</i> Pers.
<i>C. niveum</i> Rost.	

On August 28, 1928, I spent a morning in the wood and did not find a "Myxie," and only one bit of plasmodium.

(Later) There is still a dearth of Myxies in this neighbourhood. In the above List of these *Diachaea subsessilis* need not be queried. Although not previously recorded in Europe it was abundant at Flitwick for a few years. On 10th June 1931, at Stopsley, we also collected the then undescribed *Didymium trochus*, *Badhamia ovispora*, *Physarum didermoides*, and others. (C.C. *in litt.*, 1/12/1935).

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SOME ROSE NOTES.

Lt.-Col. A. H. WOLLEY-DOD.

Since the publication of my "Revision of British Roses" in 1931, I have continued to receive notes from Dr R. Keller on our British forms, for which he has suggested many names which are new to the British list, and some are no doubt undescribed varieties or forms.

Further study confirms my opinion that a large number of specimens, probably the majority, do not agree precisely or even approximately with any described variety or form, and many of Keller's determinations are qualified by some such words as "approximately" or "near" some named form. In no British genus is the saying more strongly confirmed than in *Rosa* that Nature does not recognise species (or varieties or forms), and the names to be given to any specimen depend on nothing more substantial than the opinion of the namer as to the interpretation to be placed on the authors' descriptions. It has been remarked before that the solution lies between two extremes, either the foundation of a vast number of new varieties and forms, or else a wider interpretation of the descriptions of the existing ones.

I have endeavoured to follow the latter course, though there may be many botanists who think that there has been too much splitting in the genus, and not without reason, if one is to continue to place reliance on the points which have been selected by rhodologists for their resolution into varieties, etc. For example, it has been customary to place varietal value on the pubescence according to whether it exists beneath or above the leaflets, or even at all, as well as its amount and distribution, so that it is really difficult to say where one species, variety, or form ends and another begins. But to ignore these features would revolutionise the nomenclature of the whole genus, for which the time does not appear yet to be ripe. Similar considerations apply to dentition, glandular development, shape of fruit, etc., while the general appearance or facies of the specimens is ignored, the result being that most incongruous looking specimens come together under the same name.

The names which follow are for the most part those which have been given by Keller himself, or which have been suggested by his determinations, but which have been modified to bring them into line with our British nomenclature. In some cases it has been difficult to follow Keller, since he gives an interpretation of leading varieties which can hardly have been intended by their authors. This is especially the case with the varieties and forms ranged under the Subcaninae and Subcollinae.

It will be observed that I am not adopting, for reasons which I give, all the names which Keller has suggested, and only mention those which have been suggested by him in the past three or four years. There are

many more names which have been proposed by him in earlier years which I am not referring to in the present paper, unless further specimens have shown the desirability of adopting them. A short table is given at the end of this paper, giving the new names I am adopting, with very brief notes on their characteristics.

I am very greatly indebted to Mr E. B. Bishop and to Mrs Corstorphine for specimens, as well as for valuable notes and opinions, the former from Sussex and Surrey, and the latter from Angus. Indeed, without their help this paper would never have been written.

The numbers and letters preceding the names indicate the positions they should occupy in the sequence adopted in "Rev. Brit. Roses," the interpolated varieties or forms having either an advance of letter or the addition of (1), (2), etc., after the present one. New hybrids are indicated by a capital letter after the numeral.

3A. $\times R.$ **debilis** *hyb. nov.* *R. arvensis* \times *canina* ?—Aculeis paucis, parvis, rectis, basi elongatis; foliis plerumque 5, parvis, ovatis, subobtusis, satis grosse serratis in ratione magnitudinis, in nervo medio pubescentibus; petiolis satis leviter pubescentibus, eglandulosis; pedunculis solitariis, longis, laevibus; fructibus parvis, ovoideis, plerumque male formatis aut abortivis; sepalis integris.

Prickles few, small, straight, with long bases; leaflets usually five, small, ovate, subobtusate, rather coarsely serrate for their size, pubescent on the midribs; petioles thinly pubescent, not glandular; peduncles solitary, long, smooth; fruit small, ovoid, commonly ill-formed or abortive; sepals entire.

This hybrid was found on Dunsfold Common by E. B. Bishop. Keller said it was clearly a hybrid, but felt some uncertainty as to the *canina* parentage. Except for its ill-formed fruit it might pass for a small form of *f. laevipes*.

Several other hybrids of *R. arvensis* have been found on Chiddingfold and Horsell Commons, both in Surrey, differing in many respects from both *R. debilis* and $\times R.$ *Wheldoni*, but they do not present very definite characters by which they can be described, except that they are more or less intermediate between *R. arvensis* and other species, and are barren. Besides *R. canina*, Keller has suggested *dumetorum* and *systyla* as parents, but it is better for the present to consider them as forms of $\times R.$ *debilis*, leaving them otherwise unnamed.

4A. $\times R.$ **rufescens** *hyb. nov.* *R. stylosa*, var. *systyla* \times *dumetorum*. Generaliter ut in *R. dumetorum*, sed foliosis quinque, satis parvis, subtus per totam laminam pubescentibus, supra glabris subglabrisve, junioribus stipulisque interdum rufescentibus; pedunculis solitariis, satis longis, leviter breviterque glandulosis; fructibus anguste ovoideis, frequenter male formatis abortivisve; sepalis satis longis, valde pinnatis; stylis ut in var. *systyla*, in disco conico.

General characters of *R. dumetorum* but leaflets five, rather small, pubescent all over beneath, glabrous or subglabrous above, the young

ones and the stipules sometimes suffused with red; peduncles solitary, rather long, finely hispid; fruit narrowly ovoid, but usually ill-formed or abortive; sepals rather long, and strongly pinnate; styles like those of var. *systyla*, on a conical disc.

Found by Mrs Wilde on Chiddingfold Common, and named by Keller, but with some slight expression of doubt as to the parentage, though his determination is quite acceptable.

Another form, possibly of the same hybrid, found on Dunsfold Common, differs from var. *systyla* in no respect except in some degree of barrenness of the fruit, which in itself is not proof of hybridity.

9A. $\times R.$ *setonensis* *hyb. nov.* *R. spinosissima* \times *coriifolia*, var. *Watsoni* ? Aculeis paucis et parvis, leviter curvatis, aciculis relative paucis; foliosis parvis, late ovatis, breviter acutis aut apice rotundatis, biserratis, supra glabris subglabrisve, subtus ad costam et nervis primariis satis leviter pubescentibus, eglandulosis; petiolis leviter pubescentibus; fere eglandulosis; pedunculis solitariis, laevibus, aut rarius parce hispidis; fructibus subglobosis, laevibus, frequente male formatis; sepalis erectis aut patento-erectis, haud longe persistentibus, integris aut paucis pinnis munitis, dorsis haud multo glandulosis.

Prickles few and small, slightly curved, acicles comparatively few; leaflets small, broadly ovate or rounded at the apex, biserrate, glabrous or subglabrous above, rather thinly pubescent on midrib and primary nerves beneath, eglandular; petioles slightly pubescent, almost eglandular; peduncles solitary, smooth or rarely slightly hispid; fruit subglobose, smooth, often ill-developed; sepals erect or spreading-erect, not long persistent, entire or with few pinnae, not much glandular on the backs.

This hybrid, which was gathered by Dr G. Taylor at Port Seton, Haddington, is without doubt the same as that distributed by Barclay as *R. hibernica* Sm. (*R. pimpinellifolia* \times *coriifolia*, var. *Watsoni*) and may have been gathered from the same bush (see W.E.C. 1911-12 Rep., 337-8, with a long note). I had placed my own specimen from Barclay under $\times R.$ *laevigata* Baker, with the description of which it closely agrees, but it has very different prickles. There is also considerable agreement with Baker's description of his *R. celerata*. It is quite distinct from $\times R.$ *cantiana*, which also grows at Port Seton.

16. $\times R.$ *WILSONI* (Borr.) W.-Dod. Good forms of this hybrid have been found in Angus, and I have seen it from North Northumberland, Haddington, and Derry, which discounts the suggestion that it is derived from *R. tomentosa*, var. *scabriuscula*, f. *Leesii*, see *Rev. Brit. Roses*, p. 19.

25i. $\gamma R.$ *CANINA*, var. *DUMALIS*, f. *CLADOLEIA* (Rip.) W.-Dod. Keller has given the name of var. *dumalis*, f. *acrophylla* R.K. to a specimen from Elstead Common, Surrey. He subdivides the Dumales to a much greater extent than I do, and characterises his f. *acrophylla* by its narrower leaflets and fruit, which this specimen shows, but it is too near

f. *cladoleia* to segregate from it, so I do not propose to adopt the name.

25t. R. CANINA, var. VERTICILLACANTHA Baker. A form of this variety with spreading or spreading-erect sepals was gathered by Bishop on Dolley's Farm, Horsell. Keller regards the rising sepals as an indication that it is a *Subcanina* form, disregarding the absence of woolly styles or other characteristics of that group, and says it is near his var. *Kummeri*, a name he has before suggested for a specimen from Gloster, and two or three from the Highlands. The Horsell plant has somewhat densely hispid styles, though not characteristic of any *Afzeliana* variety, which, moreover, are very rare in the south-east counties, and not to be included except on the very best evidence, which is lacking here. It agrees in many respects with Keller's description of var. *Suberti* Rip., but not with that of its author in some important particulars, and that is not certainly a British variety. The Horsell plant must go as a form of *verticillacantha* with rising sepals. It is noteworthy that Keller wrongly describes the styles of var. *verticillacantha* as being glabrous or subglabrous.

25t. β R. CANINA, var. VERTICILLACANTHA, f. CLIVICOLA Rouy. A specimen from near Dundee was referred by Keller to *R. canina*, var. *adenocalyx*, f. *glaucophylla* R.K. (non Winch), but that form seems to be so near f. *clivicola* that it is not desirable to add it to our list. Moreover, the specimen is more probably one of the *Subcaninae*, and may be regarded as a small-leafleted var. *pseudo-Haberiana*, but without any form name.

25t. γ R. CANINA, var. VERTICILLACANTHA, f. LEMAITREI (Rip.) W.-Dod. A form of this from Torberry Hill, West Sussex, is referred by Keller to his form *arezzensis*, which differs from f. *Lemaitrei* mainly in its more lagenoid fruit, a feature not at all obvious in the specimen, so the name is not adopted.

25 and 29. R. CANINA and R. DUMETORUM forms are more frequent in the southern Highlands of Scotland than has been supposed, but north of Argyll, Perth and Angus are usually replaced by *Afzeliana* and *coriifolia*, though *R. dumetorum*, f. *semiglabra*, is known in two or three stations in Orkney.

29. R. DUMETORUM Thuill. Keller's latest arrangement of this species differs slightly from that of Keller and Gams, referred to in *Rev. Brit. Roses*, pp. 25 and 45. He makes *R. canina* L. an aggregate species with three subspecies of equal value, *R. Pouzini* Tratt., *R. vulgaris* Gams (*R. canina* auct. plur.), and *R. dumetorum* Thuill. He does not use the name of *R. dumetorum* as a segregate at all, that is to say, he has no typical variety, but divides the aggregate into three main groups, with leaflets simply, irregularly, and doubly serrate. The first group is the largest one, its first subgroup, namely those with smooth peduncles and leaflets pubescent beneath only, being headed by var.

platyphylla (Rau) Chr., with 32 forms; the subgroup with leaflets pubescent on both sides being collected under var. *Thuillieri* Chr. (regarded by some as the type), having four minor varieties and 18 forms.

A difficulty arises in attempting to correlate British and Continental varieties on account of Keller having ignored Rau's description of the leaflets of var. *platyphylla* being biserrate towards the tip, a character also usually disregarded by British botanists. Many examples of the forms and varieties associated with this in Britain have either simple or very slightly double serration.

Another difficulty is due to Keller's use of Ripart's ambiguous *hispidula* in the simply serrate group, as the leading variety of a small subgroup having leaflets glabrous above, but with hispid peduncles. This covers var. *incerta* Déségl., a much less ambiguous name and more suitable to stand at the head of the group. Keller uses the name of var. *hispidula* Rip. in both *R. canina* and *R. dumetorum*, but this confusion need not have arisen had he not admitted pubescent midribs into his *R. canina*. Var. *Deseglisei* comes in another subgroup by reason of its leaflets being pubescent on both sides.

The group with biserrate leaflets is headed by var. *hemitricha*, which is proving to be a considerable one in Britain. When its leaflets have subfoliar glands it becomes my subgroup *Mercicae*, and forms a link with *R. obtusifolia*, var. *sclerophylla*, under which further remarks will be found.

29b. β *R. DUMETORUM*, var. *RAMEALIS*, f. *URBICOIDES* (Crép.) Braun. Keller gives the name of f. *urbicoides* to forms of *urbica* with leaflets narrowed at the base and oblong fruit, but makes no mention of var. *ramealis* (Pug.). He considers that a South Devon specimen may be placed here. I propose to retain the name of var. *ramealis* for the obovoid or oblong-fruited varieties of *R. dumetorum*, when the leaflets are more or less rounded at the base, those with them narrowed at the base now being referred to f. *urbicoides*. I associate other S. Devon forms with the one seen by Keller, which was gathered by Moyle Rogers, also specimens from West Gloster, Hereford, Oxford, and Hunts, all of which I had placed under var. *ramealis*, which now seems to be rarer than its form *urbicoides*.

29g. β *R. DUMETORUM*, var. *HEMITRICHA*, f. *BALTICA* Holzf. For some time var. *hemitricha* has been the only name used in Britain for all decidedly biserrate varieties of *R. dumetorum* with smooth peduncles and no subfoliar glands, but on the Continent there is a large number of both irregularly serrate and fully biserrate varieties and forms. The former are Keller's group *Transitoriae* (which he maintains in *R. dumetorum* and in other species as well as in *R. canina*) and are headed for the most part by var. *subglabra* (Borb.), covering certain others such as *trichoneura* Rip., *jactata* Déségl., *submitis* Gren., etc., and if Rau's description be adopted, his var. *platyphylla* must be included. Some of these names appear in the British list as synonyms, and it is not pro-

posed at present to disturb this arrangement, but the group is in need of revision.

The name of *f. baltica* Holzf. must be adopted for the forms with strong glandular biserration. It has been suggested by Keller for some Scottish examples, and may be widespread, though no doubt many intermediate forms are to be found.

29i. β *R. DUMETORUM*, var. *DESEGLISEI*, f. *ROHRERI* R. Kell., has been published by E. B. Bishop in B.E.C. 1934 Rep., p. 902, as a name to cover forms of the variety with very large leaflets, large elongate fruit, and glabrous styles. It was found on Witley Common, and Keller at first proposed the name of *f. Othmarii* R.K. for it, to which he said it made a very close approach, but since its leaflets are obviously pubescent above as well as beneath, it is better under the very closely allied *f. Rohreri*.

29l(1). *R. DUMETORUM*, var. *FANASENSIS* R. Kell. When forms allied to var. *hemitricha* have very strong biserration they may develop subfoliar glands, which take them into my group *Mercicae*. This group name is not used by Keller, but he has three varieties with subfoliar glands, *fanasensis*, *Carionii* (Déségl. & Gill.), and *villosula* (Paill.). Of these the last two have broadly oval or even suborbicular leaflets, while his *fanasensis* has them rather narrow and often much narrowed at the base, and is therefore the best name for our forms. They are characterised also by the leaflets being more or less pubescent both sides, usually though not always with subfoliar glands, at least on some leaflets, and elongate glabrous styles, but with pilose stigmas.

I refer to var. *fanasensis* R.K. specimens from Grayswood, Surrey, and two gatherings from north-east Yorks by Dr Taylor. None of the three is quite characteristic, the Surrey one having hispid styles, and the two Yorkshire ones shortly ovoid fruit, but there is no nearer name.

Keller remarks on the affinity of his variety and some allied forms with *R. obtusifolia*, no doubt through var. *sclerophylla*, and indeed it is most difficult to define cardinal characters by which they can be segregated specifically. (See also under *R. obtusifolia*, var. *sclerophylla*).

The introduction of var. *fanasensis* into our list necessitates an alteration in the definition of group *Mercicae*, by the excision of the words "peduncles glandular-hispid," since they are smooth in that variety.

31e. *R. AFZELIANA*, var. *SUBCANINA* Chr. Keller has referred a Chelsfield, Kent, specimen to his var. *eristyla*, but with some doubt, since its sepals had fallen, though that very character is a leading feature of the *Subcaninae*. Keller, however, does not use this as a group character, and moreover distinguishes *eristyla* from *subcanina* by its woolly styles, disregarding the fact that those of *subcanina* itself are woolly. His treatment of the group is not on parallel lines to ours, so I do not propose to adopt the name of *eristyla*. The specimen is quite distinct from Groves's much disputed "var. *Crepiniana*" from Chelsfield, which Keller thinks is a *subcanina* form.

31e. *β* *R. AFZELIANA*, var. *SUBCANINA* Chr., f. *LATIFOLIA*, forma nova—Foliolis magnis latisque, usque ad 35 mm. longis et 25 mm. latis, minoribus ratione similibus, frequenter truncatis vel etiam basi emarginatis; fructibus magnis, subglobosis; pedunculis stylisque ut in varietate.

Leaflets large and broad, up to 35 mm. long by 25 mm. broad, the smaller ones with the same proportions, commonly truncate and even quite emarginate at the base; fruit large, subglobose, with the peduncles and styles of the variety. It was found by Col. Johnston in two stations at Hoy, Orkney. It has so distinctive an appearance that I have founded a new form on it, in spite of its restricted distribution.

31h. *R. AFZELIANA*, var. *KUMMERI* R. Kell. This is a name proposed by Keller for certain plants from Angus, Gloucester, and Surrey. The Angus specimens differ so little from var. *pseudo-Haberiana* that it is not desirable to give them a separate name. Even the description of var. *Kummeri* indicates no important feature, so it is not adopted. The Surrey plant is referred to under *R. canina*, var. *verticillacantha*.

31k. *R. AFZELIANA*, var. *BRIQUETI* R. Kell. This variety, which is mentioned on p. 105, *Rev. Brit. Roses*, has been found in several Angus stations, also in Cumberland, N.E. Yorkshire, Derby and Warwick. The Warwick specimen is one of two from herb. Groves, labelled Nos. 1 and 2, *R. marginata*. No. 1 is *R. canina*, var. *Blondaeana*, f. *vinacea*, while Keller refers No. 2 to a new form of *R. Afzeliana* (*Subcaninae*), var. *clivicola* Rav. (non Rouy), but he overlooks the subfoliar glands which make it var. *Briqueti*, of which it is a very small-leafleted form.

Keller thought one of the Angus specimens was *R. Afzeliana*, var. *glandulifera* R.K., f. *mixta*. He never published the form name, and his var. *glandulifera* has smooth peduncles, those of var. *Briqueti* being hispid.

32a(1). *R. CORIIFOLIA*, var. *SUBGLABRA* R. Kell. There has been a lack of suitable names in the British list for the less pubescent leaved varieties and forms of the type. Hitherto we have used *R. coriifolia*, var. *typica* Chr., for those with simple serration, smooth peduncles and leaflets pubescent on both sides, with f. *frutetorum* as a form with very slight biserration, and f. *implexa* for those with leaflets glabrous above and subglabrous beneath. A better arrangement is to make use of Keller's var. *subglabra* for all those which are glabrous above and more or less pubescent beneath. The variety normally has subglobose fruit and may run into two forms, f. *subobovata* Rouy in which it is ovoid or ellipsoid, and f. *implexa* (Gren.) when it is subglobose but the pubescence confined to the midribs only.

Examples which may be placed to var. *subglabra* have been identified from Mid-Perth, North-west Yorks, Cheshire, Salop, Stafford, and Derby, while f. *subobovata* has been found in South Northumberland, North-west and Mid-west Yorks. Some, but not all of these, have been named by Keller, and others have been previously referred to var. *typica*

or to *f. implexa*. It will probably be found that var. *subglabra* is our commonest variety.

32. Group SUBCOLLINAE. This has always been a difficult group in Britain, except for var. *subcollina* Chr. itself and var. *caesia* (Sm.), both of which are treated by Keller on quite different lines to the British idea of them. None of its varieties in our list appear in Keller's "Synopsis," so that his names are not easily correlated with the British ones. The following five varieties and two forms will, it is hoped, help to bring our list more into agreement with the Continental one, though its prolongation may be regrettable. The first two forms, for example, are found mainly upon the distribution of the pubescence on the leaflets, which is a variable feature, but is always taken cognisance of in other species and varieties. It must be borne in mind that the whole species of *R. dumetorum* and *R. coriifolia* may be regarded as two series of pubescent-leaved varieties of *R. canina* and *R. Afzeliana* not as species, though some individual varieties in each may have no precise parallel in the others.

32f. β *R. CORIFOLIA*, var. SUBCOLLINA, f. DIMORPHOCARPA (Borb. & Br.) R. Kell. As with *R. coriifolia* typica, so with var. *subcollina*, names have been lacking to cover the variation of leaf pubescence. Var. *subcollina* has them glabrous above and pubescent only on the mid-ribs or also primary nerves beneath. Keller names specimens with pubescence all over the under surface, f. *dimorphocarpa*, but up to the present this has only been identified from Angus, though it is most probably more frequent than typical var. *subcollina*.

32f. γ *R. CORIFOLIA*, var. SUBCOLLINA, f. INCANA (Kit.) R. Kell. non auct angl. In this form the leaflets are pubescent on both surfaces. The plant referred to in W.E.C. 1931-2 Rep., 123, from Dunsfold Common, belongs here. A later gathering of it was referred by Keller to his var. *lophophyton*, but that differs so slightly that it is almost synonymous. Specimens from Elgin, Mid and East Perth, and Stafford also belong here, and a specimen from Cumberland by C. Bailey labelled "*R. caesia* Sm., approaching *Watsoni* Baker," probably belongs here also. It is likely to be as common or commoner than either typical var. *subcollina* or f. *dimorphocarpa*. It is quite distinct from var. *incana* Woods, which is an obscure form of var. *caesia* Sm.

32f(1). *R. CORIFOLIA* (Subcollinae), var. PASTORALIS R. Kell. Keller gives this name, with certain reservations, to a specimen from Letham, Forfar, with large, coarsely, almost simply serrate leaflets, pubescent below and slightly so above, and hispid peduncles. The only fruit on the specimen is ovoid-subglobose, instead of "pyriform and narrowed into the peduncle" as described, but otherwise it agrees fairly well with its description. The name may be used for hispid-peduncled varieties of the Subcollinae with simply or subsimply serrate leaflets, pubescent on both sides.

32g(1). *R. CORIIFOLIA* (Subcollinae), var. *HAUSMANNII* Braun. The names of the British biserrate varieties of the Subcollinae have always been in some confusion. Barclay's var. *subcoriifolia* is admittedly an aggregate, and covers forms with or without hispid peduncles and subfoliar glands, and with varying pubescence on the leaflets, but its author was strict in confining it to forms with ovoid-pyriform or obovoid fruit. The position of var. *Lintoni* is ambiguous, Scheutz having described its sepals as erect-patent, which would make it one of the *Coriifoliae Typicae*, while specimens from the original bushes have them all spreading-reflexed, or at most spreading, which is characteristic of the Subcollinae. Baker's *pruinosa* is a mixture of smooth and hispid-peduncled forms, varying greatly in leaflets and fruit, while his *obovata* is a rare and local form. None of these names are used by Keller nor on the Continent generally, so that a direct comparison of our own and European forms is difficult.

Keller uses the name of var. *Hausmannii* for varieties of the Subcollinae having decided but not strong, and sometimes even quite weak biserration, the leaflets being subglabrous above and pubescent all over beneath, with no subfoliar glands, and smooth peduncles. It comes nearest to var. *pruinosa* in our list, but lacks its strong biserration and broad or even subcordate bases to the leaflets. Specimens from Angus, East, West and Mid Perth, South Aberdeen, Durham and North Yorks may be placed here. Keller had proposed the name of var. *Aschersoni* R. Kell., f. *ploenensis* R.K., for the North Yorks specimen, but that is merely a rather more biserrate form which may be regarded as synonymous. This last name has also been suggested by Keller for a specimen from Angus, which is almost certainly a *dumetorum* form of var. *hemitricha*, f. *baltica*.

32g(1). β f. *CASTRENSIS* Schwertsch. is a suitable name for a very globose-fruited form from Angus.

32h. β *R. CORIIFOLIA* (Subcollinae), var. *SUBCORIIFOLIA* Barcl., f. *PERPUBESCENS*, f. nov. Generaliter ut in *subcoriifolia*, sed foliis utrinque pubescentibus, haud subtus solum, cum glandulis subfoliaribus; pedunculis laevibus.

General characters of var. *subcoriifolia* Barcl., but with leaflets pubescent on both sides instead of beneath only, with subfoliar glands, and with smooth peduncles. Gathered by Mrs Corstorphine at Loch Fithie, Angus. Its elongate fruit at once distinguishes it from var. *Wilczekii*. A similar form from the Pass of Leny, Mid Perth (Barclay, No. 182). was labelled by him var. *subcoriifolia*, from which it differs in the pubescence on the upper surface of the leaflets. A specimen from Strath Tay probably also belongs here.

32j(1). *R. CORIIFOLIA*, var. *WILCZEKII* R. Kell. This name may be used to cover forms of the Subcollinae which have biserrate leaflets, not rounded or subcordate at the base, glabrous above, pubescent beneath, with subfoliar glands, smooth peduncles, and subglobose or broadly ovoid

fruit. It differs from *subcoriifolia* essentially in the form of its fruit, and from Baker's very indefinite var. *pruinosa* in the shape of its leaflets and their subfoliar glands. From var. *Lintoni* it differs in its sepals being definitely reflexed and its leaflets glabrous above. It has been named by Keller from several stations in Angus.

32j(2). *R. CORIIFOLIA* (Subcollinae), var. *HOFMANNII* R. Kell. A specimen gathered in 1931 at Dale Head, Cumberland, has hitherto been without a name. Keller thought it near *R. subcanina*, var. *bovonnazensis*, saying that its leaflets were pubescent on the midribs only, which for him would have made it one of the Subcaninae, but those of the Dale Head specimen are very obviously pubescent all over the lower surface, which places it in the Subcollinae. A much more suitable name is var. *Hofmannii* R.K., which for the present may be taken to cover biserrate Subcollinae, with leaflets pubescent all over beneath, no subfoliar glands, and hispid peduncles. It usually has a broadly ovoid slightly hispid fruit, but no other special feature. It has not been identified elsewhere in Britain.

32l. *R. CORIIFOLIA* (Subcollinae), var. *PAICHEANA* R. Kell. There has been a suggestion of the existence of this variety in Britain, see *Rev. Brit. Roses*, p. 69, but the specimens were too uncertain to allow its adoption. A specimen from Wythrop, Cumberland, found by Miss Todd, agrees quite well with Keller's description, so it may be definitely recorded for Britain. It is marked by its biserrate leaflets, glabrous above and pubescent mainly on the nerves beneath with subfoliar glands, and hispid peduncles. The fruit is broadly ovoid and typically should be subglobose. The specimen has not been seen by Keller. It is near var. *Hofmannii*, but that has no subfoliar glands. Its hispid peduncles distinguish it from vars. *Hausmannii*, *Wilczekii*, and *Lintoni*, its narrower much less pubescent leaflets with subfoliar glands from *pruinosa*, and its subglobose fruit from var. *subcoriifolia*.

34A. × *R. subobtusifolia* hyb. nov. *R. obtusifolia*, var. *decipiens* × *canina*. Aculeis robustis, arcuatis, declinatisve, in ramis numerosis magisque uncinatis; foliolis plerumque quinque, parvis, late ovalibus, ad basin latissimis, breviter acutis, biserratis, utrinque pubescentibus, supra satis obscure, petiolis dense pubescentibus, satis dense glandulosis; pedunculis solitariis, circa 12 mm. longis, parce aut satis glandulosis; fructibus parvis, late ovoideis si bene formatis, plerumque autem abortivis, tunc angustis; sepalis reflexis, pinnis latis ferentibus; stylis exsertis, hispidis.

Prickles stout, arcuate or declining, those on the branches numerous and more uncinatate; leaflets usually five, small, broadly oval, very broad at the base, shortly acute, biserrate, pubescent on both sides, rather obscurely so above; petioles densely pubescent, considerably glandular; peduncles solitary, about 12 mm. long, weakly or moderately hispid; fruit small, broadly ovoid when well formed, but mostly abortive and then narrow; sepals reflexed, with broad pinnae.

Found by W. Biddiscombe near Dolley's Farm, Horsell, and referred to this parentage by Keller. The foliage is like that of a biserrate *obtusifolia* and it is probable that var. *decipiens* is one of the parents, while the other is equally likely to be *R. canina* or *R. dumetorum*. In general appearance it closely resembles $\times R. concinnoides$, but that is simply serrate. It differs from $\times R. surreyana$ chiefly in its much smaller leaflets, though otherwise the two hybrids show no important differences. $\times R. bickertonensis$ bears a much closer resemblance to ordinary var. *tomentella*, while $\times R. tomentelliformis$ is abundantly distinct.

37b. ϵ *R. villosa*, var. *mollis*, f. *ANNESIENSIS* (Déségl.) R. Kell. This is a suitable name for a form of var. *mollis* gathered at Dalmeny, Linlithgow, by G. Taylor. It is in all respects similar to var. *mollis* but has ovoid-ellipsoid fruit. Specimens from Lanark and Orkney may also belong here. Keller has given the name of *R. villosa*, var. *pomifera*, f. *lagenoides*, to forms with similar fruit, but with larger though hardly parallel-sided leaflets, but since the specimens were taken from a small tree, not a bush, his identification is no doubt correct. They were found in Angus.

43c. β *R. tomentosa*, var. *dumosa*, f. *SAGOTI* Rouy. Keller thinks that a small scarcely biserrate-leafleted form of *dumosa* with small fruit from the High Tor, Matlock, ex hb. Groves, is nearest to this. His note suggests that he thinks it does not quite match it, but it is nearer to his description of f. *Sagoti* than to two other allied small-leafleted forms, and I think may be accepted for our list.

Two other sheets from hb. Groves, also from the High Tor, were labelled Nos. 1 and 2, without any suggestion of a name. They are in many respects much like f. *Sagoti*, especially in their small very slightly biserrate leaflets. The fruit, however, is small, subglobose, and often barren, in clusters of two to six, on short peduncles. Keller thinks they are hybrids, no doubt with *Sagoti* as one parent, but the other is quite undeterminable, perhaps some *canina* or *dumetorum* form.

43f. β (1) *R. tomentosa*, var. *scabriuscula*, f. *GISLERI* (Pug.) R. Kell. This is a suitable name for the Rose sent by Miss Roper to the Bot. Exch. Club as *R. tomentella*, var. *decipiens*, from Llanberis, see Rep. for 1931, 827. Keller named the specimen *R. abietina* Gren., without any qualification, but that species is not yet definitely established as British. The name of *R. abietina* appears in one form or another as a synonym of several varieties, even in different species, in Boulenger's "Roses d'Eur.," and he says it lies between *R. obtusifolia* and *R. canina*, though with an association with *R. tomentosa*. He thought my *R. dumetorum*, var. *mercica*, was a form of *R. abietina*. Miss Roper's specimen agrees very well with Keller's description of f. *Gisleri*, and since both he and Boulenger say that that form is a variety of *R. abietina*, his opinion seems to be met. It may be regarded as a connecting link between ordinary *scabriuscula* and its forma *foetida*, hav-

ing narrower leaflets than the latter, with fewer less conspicuous sub-foliar glands.

45A. × *R. Burdoni* hyb. nov. *R. tomentosa* × *rubiginosa*. Aculeis suberectis, leviter declinatis aut subarcuatis, in ramulis floriferis paucissimis aciculis mixtis, foliis ovalis, acutis, valdissime glanduloso-biser-ratis, utrinque tenuiter pubescentibus, subtus tenuiter glandulis obtectis; pedunculis solitariis, glanduloso-aciculatis; fructibus anguste ovoides, in toto abortivis, tectis ut in pedunculis; sepalis patentibus, sub-persistentibus, dense glandulosis aciculatisque; stylis hispidis, nec dense.

Prickles straightish, slightly declining or subarcuate, mixed with a very few acicles on the flowering branches; leaflets oval, acute, strongly glandular-biserrate, thinly pubescent on both sides, and slightly glandular beneath; peduncles solitary, glandular-aciculate; fruit narrowly ovoid but wholly abortive, clothed as on the peduncles; sepals spreading, subpersistent, densely glandular and aciculate; styles hispid, but not densely so.

This hybrid was gathered by Preb. R. J. Burdon, near Ashiestiel, Selkirk, and sent to the Wats. Exch. Club in 1930. The parentage is agreed to by Keller.

A very unusual form or hybrid of *R. tomentosa* was found by J. Groves at King's Quay, I. of Wight. Keller thinks it is certainly a hybrid, and probably with *R. spinosissima*, but except for a little heter-acanthly, there is little suggestion of that species. Otherwise, except for a marked reduction on fertility, it might well be one of the *Scabriusculae* allied to *f. foetida*. It is too ill-defined to describe as a new hybrid.

46a. *R. RUBIGINOSA* L. A small-leaved form, remarkable for the entire absence of heteracanthly below the inflorescence, was gathered by Dr G. Taylor at Nairn Links. It seems to be near var. *macrostylis* Schwertsch., but I do not propose to introduce this name to the British list, and leave the specimen under var. *typica*.

46c. *R. RUBIGINOSA*, var. *ECHINOCARPA* (Rip.) Gren. A specimen from Strath Tay, Perth, had better go here. Keller suggested the name of var. *umbellata* (Leers) Dum., f. *dimorphacantha* (Mart.) Borb., for it, but his treatment of var. *umbellata*, f. *echinocarpa*, and f. *dimorphacantha* shows that there is very little difference between them, and it is not advisable to introduce this new name to the British list, leaving it as var. *echinocarpa*. Strictly speaking, this variety should have a roundish-ovoid fruit, but specimens named by Ripart himself, as well as all British forms referred to it, have it quite ovoid or even ellipsoid.

46A. × *R. molliformis* hyb. nov. *R. rubiginosa* × *villosa*, var. *mollis*. Aculeis rectis, tenuibus, sub inflorescentia aciculis haud mixtis; foliis frequenter 5, approximatis, magnis, suborbicularibus, utrinque satis pubescentibus, glandulis subfoliaribus dense tectis; pedunculis 1-3, satis brevibus, glanduloso-aciculatis; fructibus subglobosis,

parce aciculatis, frequenter male formatis; sepalis valde aciculatis glandulosisque, suberectis, moderate pinnatis; stylis lanatis.

Prickles straight, slender, without acicles beneath the inflorescence; leaflets usually 5, close-set, suborbicular, rather densely pubescent both sides, with copious subfoliar glands; peduncles rather short, glandular-aciculate; fruit subglobose, thinly aciculate, often ill-formed, sepals densely aciculate and glandular, suberect, moderately pinnate; styles woolly.

A very good intermediate, hitherto only found by Miss Todd in Inverness.

47a. γ *R. MICRANTHA*, var. *TYPICA* Chr., f. *VISCIDA* (Pug.) Rouy. Keller arranges the bulk of his varieties of *R. micrantha* in two groups, those with leaflets glabrous or pubescent on midribs beneath only, and those which are pubescent all over the lower surface. Christ's var. *typica* comes under the latter group while Rouy's var. *normalis* is under the former, which somewhat upsets the British arrangement, and if adopted would necessitate the renaming of many of the specimens. Keller thinks that var. *normalis* Rouy is the commonest variety of the group with subglabrous leaflets, but I propose to place f. *viscida* Rouy (which is really a form of *normalis*) under var. *typica*. It is represented by a plant from Banstead Downs, Surrey, and has very small, subglabrous leaflets. Much of our var. *Lemania* has leaflets equally small, but in the latter they are much narrower and sometimes pubescent all over the backs, which would remove them from Keller's group headed by var. *normalis* Rouy, in which he places *Lemania*.

47g. *R. MICRANTHA*, var. *BURGESSI* Bishop, in B.E.C. 1933 Rep., pp. 468-471. Whole plant suffused with red. Leaflets slightly pubescent on midribs beneath only; fruit elongate-ovoid; styles very woolly; petals deep rose.

Hybrids of *micrantha*, etc. There appear to be more hybrids in West Sussex between *R. micrantha*, *R. agrestis*, and *R. canina* than there are described in *Rev. Brit Roses*, pp. 99 and 106, but it is most difficult to assign a definite parentage to any of them, or to write descriptions which would enable them to be recognised when found. They must be reserved for future study.

Since it may not be clear from the above notes which varieties and forms have been adopted for the British list, the following is a brief summary of such additions:—

- × *R. debilis* hyb. nov. *R. arvensis* × *canina*. With intermediate characters, but leaflets and fruit (which is barren) small.
- × *R. rufescens* hyb. nov. *R. stylosa*, var. *systyla* × *dumetorum*. Like a small-leaved *dumetorum*, with the peduncles and styles of *systyla*. Fruit ill-formed.

- × **R. setonensis** *hyb. nov.* *R. spinosissima* × *coriifolia*, var. *Watsoni*. Intermediate characters with very little glandular development, peduncles and sepals nearly smooth. Fruit commonly barren. Sepals suberect, not long persistent.
- R. DUMETORUM**, var. *RAMEALIS*, f. *URBICOIDES* (Crép.) Br. Like var. *ramealis* but with leaflets decidedly narrowed at the base.
- R. DUMETORUM**, var. *HEMITRICHA*, f. *BALTICA* Holzf. Strongly biserrate.
- R. DUMETORUM**, var. *DESEGLISEI*, f. *ROHRERI* R.K. See B.E.C. 1934 Rep.
- R. DUMETORUM**, var. *FANASENSIS* R. Kell. Like *hemitricha* with s.f. glands.
- R. AFZELIANA**, var. *SUBCANINA*, f. *LATIFOLIA*, f. *nov.* Very large leaflets and large subglobose fruit.
- R. CORIIFOLIA**, var. *SUBGLABRA* R. Kell. As in var. *typica* but leaflets glabrous above. Fruit subglobose.
- R. CORIIFOLIA**, var. *SUBGLABRA*, f. *SUBBOVATA* Rouy. Fruit ovoid or ellipsoid.
- R. CORIIFOLIA**, var. *SUBCOLLINA*, f. *DIMORPHOCARPA* (Borb. & Br.) R. Kell. Leaflets pubescent all over beneath.
- R. CORIIFOLIA**, var. *SUBCOLLINA*, f. *INCANA* (Kit.) R. Kell. Leaflets pubescent both sides.
- R. CORIIFOLIA** (Subcollinae), var. *PASTORALIS* R. Kell. Leaflets simply serrate, pubescent on both sides, peduncles hispid.
- R. CORIIFOLIA** (Subcollinae), var. *HAUSMANNII* Br. Leaflets moderately biserrate, pubescent all over beneath. No subfoliar glands. Peduncles smooth.
- R. CORIIFOLIA** (Subcollinae), var. *HAUSMANNII*, f. *CASTRENSIS* Schw. Fruit globose.
- R. CORIIFOLIA** (Subcollinae), var. *SUBCORIIFOLIA*, f. *PERPUBESCENS*, f. *nov.* Leaflets pubescent on both sides.
- R. CORIIFOLIA** (Subcollinae), var. *WILCZEKII* R. Kell. Like *pruinosa* but narrower leaflets with subfoliar glands.
- R. CORIIFOLIA** (Subcollinae), var. *HOFMANNII* R. Kell. Leaflets biserrate, pubescent all over beneath, no s.f.g., peduncles hispid.
- R. CORIIFOLIA** (Subcollinae), var. *PAICHEANA* R. Kell. Near var. *Hofmannii* but with subfoliar glands.
- × **R. subobtusifolia** *hyb. nov.* *R. obtusifolia*, var. *decipiens* × *canina*. Like a biserrate × *R. concinnoides*.
- R. VILLOSA**, var. *MOLLIS*, f. *ANNESIENSIS* (Déségl.) R. Kell. Fruit ovoid-ellipsoid.
- R. TOMENTOSA**, var. *DUMOSA*, f. *SAGOTI* Rouy. Leaflets and fruit small.
- R. TOMENTOSA**, var. *SCABRIUSCULA*, f. *GISLERI* (Pug.) R. Kell. Like a narrow-leafleted f. *foetida* with fewer subfoliar glands.
- × **R. Burdoni** *hyb. nov.* *R. tomentosa* × *rubiginosa*. Just intermediate, with thinly pubescent leaflets, hispid styles and abortive fruit.
- × **R. molliformis** *hyb. nov.* *R. rubiginosa* × *mollis*. Characters intermediate.
- R. MICRANTHA**, var. *TYPICA* Chr., f. *VISCIDA* (Pug.) Rouy. As in type but leaflets very small and subglabrous.

SOLANUM DULCAMARA AND ITS INFLORESCENCE.

W. B. TURRILL.

Solanum Dulcamara is a common and rather polymorphic species with a wide distribution in the East North Temperate Zone. According to Druce (*Comital Flora*, 211, 1932) it is recorded for all the vice-counties of Great Britain, except the northern and some of the western Scottish ones and Linlithgow (for all but 84, 98, 101, 103-105, 107-112). It occurs, in one or other of its variations, from the sea-coast to 1000 feet altitude ("just reaching 1000 in Weardale"—Wilson: *The Altitudinal Range of British Plants*, 59, 1931). Its known variations include characters of habit, leaf-shape (including segmentation and lobing), foliage colour, indumentum of vegetative parts, inflorescence branching, corolla colour, and fruit shape, size, and colour. Some of these variations are definitely correlated with habitat, as for example the so-called variety *marinum* Bab. Others are of frequent or infrequent, more or less sporadic occurrence throughout the distributional area of the species. Their genetical behaviour and ecological correlations require detailed study. Turesson (*Hereditas*, iii, 230, 1922) records different hereditary types within the species.

No full published account of the structure of the inflorescence and its variations in *S. Dulcamara* has been traced. Botanical literature is so voluminous, so scattered, and so largely unclassified that relevant papers may well have been overlooked. A considerable amount has been published concerning the inflorescences of other solanaceous plants, some of it, as is shown below, being unintelligible. It has been held by most authors that the pairing of leaves in the flowering parts is "an arrangement which, like the extra-axillary position of the flowers or cymes, is the result of congenital union of axes" (Rendle, *The Classification of Flowering Plants*, ii, 516, 1925). In modern botanical textbooks one usually finds that the writers have little new evidence to offer for the validity of highly ingenious hypotheses masquerading as morphological interpretations of inflorescence structure. Diagrams supposed to show the position of leaves and flower-branches in *Datura Stramonium*, *Atropa Belladonna*, and *Solanum nigrum* have been copied (sometimes not even accurately) from Eichler's *Blüthendiagramme*, i, 200, fig. 117 (1875). Eichler's ideas were partly taken from the earlier publications of Wydler, one of whose papers, in *Flora*, xl (Neue Reihe, xv), 225 (1857), most nearly concerns us here.

It would take too much space to analyze in detail Wydler's and Eichler's accounts of the inflorescence in the Solanaceae, but some criticisms of their interpretation of the inflorescence of *Solanum nigrum* may, perhaps, persuade some reader to undertake a full study of the inflorescences in our British representatives of the family. It is essen-

tial to examine the original figures and texts of Wydler and Eichler. Rendle's reproduction (Rendle, *l.c.*, 516, fig. 236 C) is inaccurately drawn in that it shows b (the bract of axis I) inserted above a (one of the "bracteoles" of axis I). The account of Wydler is not easy to follow. In it, assumption follows assumption. It is clear that in *S. nigrum* (as in other species of *Solanum*) the inflorescence does not arise from the apparent main axis with an immediate subtending bract. The inflorescence is said to have a terminal flower with an inflorescence branch (a simple scorpioid cyme) springing out from it laterally. To establish the existence of this terminal flower the following arguments are used:—

(1) The position of the bract (which is not there) can be recognized by the direction of nodding of the inflorescence.

(2) This position is variable and depends on the (variable) phyllotaxis.

(3) The position of the inflorescence, or what comes to the same thing, of the absent bract, changes according to the number of the preceding leaves.

(4) The first sepal of the terminal flower is the next immediately following the absent bract.

(5) In *S. nigrum*, however, the calyx aestivation is quite valvate, so the first sepal cannot be determined by direct observation.

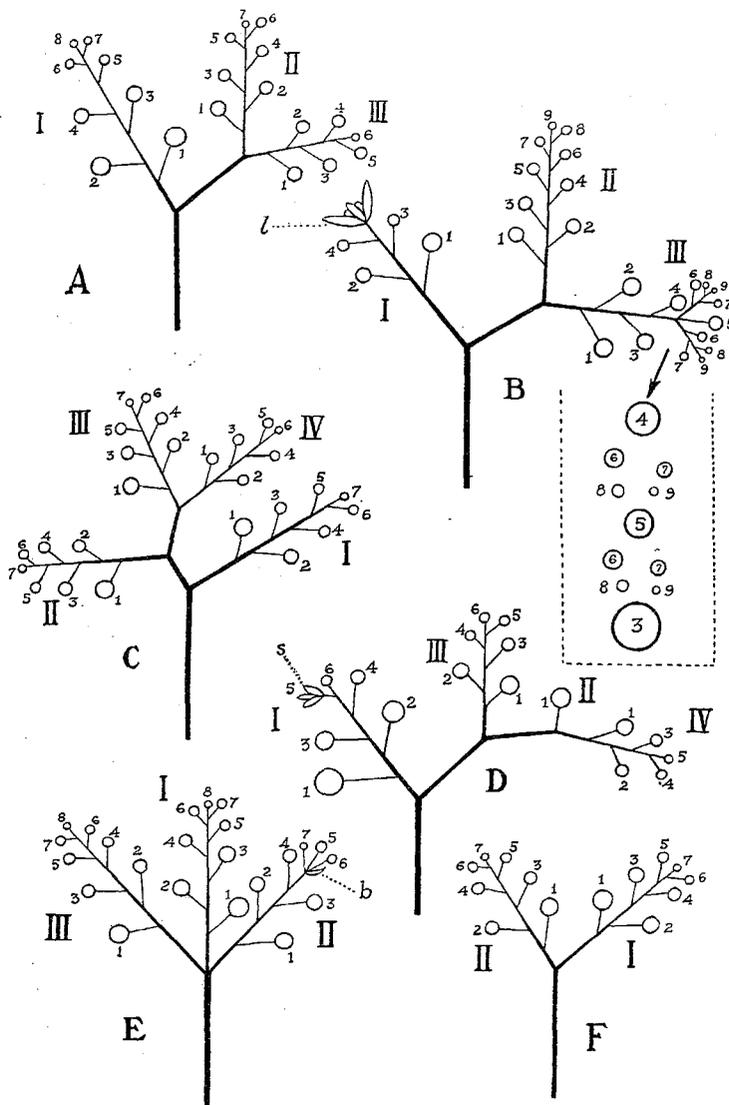
(6) Assuming that the flower has undergone no twisting, the position of the first sepal (and thus of the terminal flower, and the orientation and structure of the inflorescence) can be determined by the orientation of the two carpels which in all Solanaceae fall in a plane which passes through the first sepal.

Anyone who has tried to demonstrate to a class of students the orientation of the carpels in solanaceous flowers will appreciate the artificiality of any conclusions which may be reached by applying this method.

Turning now to Eichler's account and diagram (*l.c.*, fig. 117 E) a further criticism must be made. The scheme he elaborates is based apparently mainly on Wydler's account. It is ingenious but complicated, since it involves, in part of an apparent internode, the fusion or common "intercalary growth" of a main stem ending in an inflorescence, the base of one bracteole, and the stem axillary to this bracteole, the latter being fused above with a bracteole of a higher order and its axillary shoot. The anatomy of such a compound structure should be unusual and its ontogeny well worth detailed study. An examination of the gross morphology of living material of *S. nigrum* has not convinced me of the truth of this explanation since I have so far failed to find specimens which can be interpreted by it.

Whatever be the truth regarding the branch system and the structure of the inflorescence in *Solanum nigrum*, a simpler explanation of these is possible for *S. Dulcamara*.

The whole inflorescence has usually no apparent subtending leaf or bract immediately below it. The obvious absence (presumably by sup-



pression) of all bracts and bracteoles in the normal inflorescence suggests that a bract (or foliage leaf) immediately subtending the whole inflorescence may also have been simply suppressed. The generally accepted

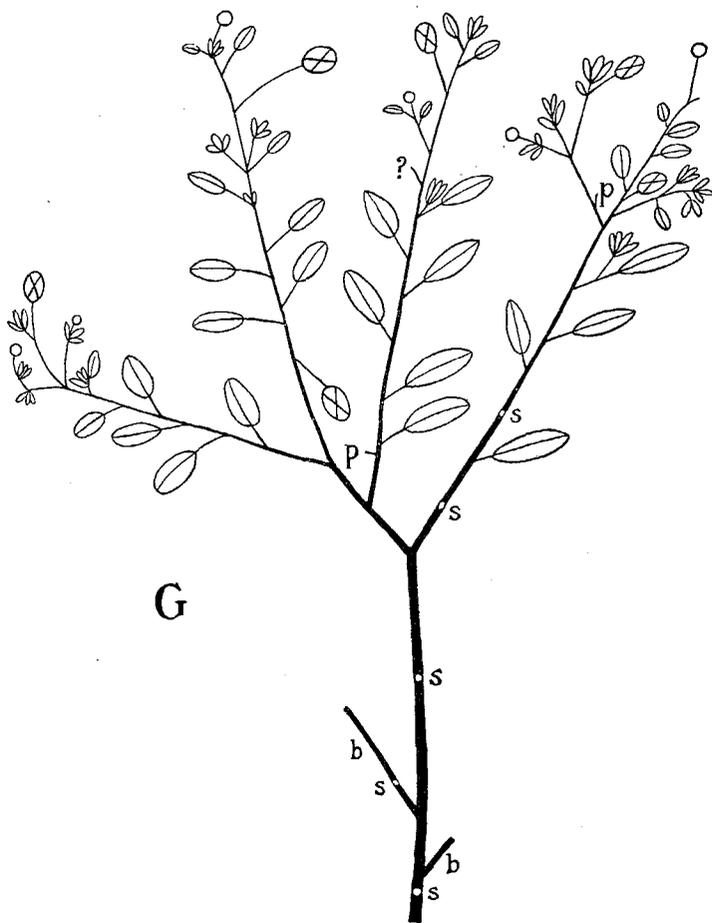
explanation, so far as can be understood from the meagre published accounts traced, is that the inflorescence is terminal while the apparent continuation of the main axis is really subtended by a leaf which by fusion is carried up some distance on the axillary branch. An objection to this is that all leaves examined have directly in their axils a branch or bud. Any fusion and relative carrying up or down of subtending leaves or axillary branches must therefore assume accessory axillary buds. The simplest explanation, and one by which the facts derived from a study of living British material can best be accounted, is that the dichotomy of the axis with one branch ending in an inflorescence and the other in a branch with leaves (and often subsequent similar dichotomy) is a real one in the sense in which "dichotomy" not infrequently occurs in Dicotyledons; that is to say, no fusion of axes from a lower axil is assumed. This does not mean that a single apical cell forks to produce a dichotomy such as occurs in many Cryptogams. Whether or not it is desirable to assume the suppression of a subtending leaf (or bract) is partly a matter of interpretation of Angiosperm "dichotomy." Since in *S. Dulcamara* there is certainly a suppression of bracts (and bracteoles) in the inflorescence, it is probably most reasonable to assume a suppression of bracts in relation to all inflorescence branching. On the other hand, the apparent dichotomy might be due to the suppression of a terminal flower and the production of two lateral branches. This is less likely in *S. Dulcamara*. The reader is referred to Goebel, *Organographie der Pflanzen*, i, 100 (ed. 2, 1913), for an account of dichotomous branching in Angiosperms.

We are, however, here mainly interested in the inflorescence itself. An examination of a large number of living inflorescences from several English counties shows that there is considerable variation in details. A number of diagrams are given here to illustrate some of the variations found. The commonest type, and that which may be taken as the standard, is shown diagrammatically in fig. A. The remaining diagrams can best be interpreted as modifications of this standard.

There is most often a complete absence of bracts, bracteoles, and leafy shoots in the inflorescence, but occasionally one or a few reduced leaves occur. The individual flower pedicels have at their bases, where they arise from the inflorescence rachis, a small surrounding "cushion" of tissue, often of a different colour (green like the rachis instead of purple like the pedicel), and causing a break in the continuity of the indumentum. The significance of this "cushion" can only be determined by anatomical and ontogenetical investigation, but it almost gives the appearance of a "pushing out" of the pedicel from deeper tissues of the rachis.

In September 1923 the late Miss M. C. Knowles, of the National Museum, Dublin, sent me material of a plant described as "a single-flowered form of *Solanum Dulcamara* L." The flowers and fruits of this material were solitary in the sense that leaves and sometimes leaf-bearing shoots intervened between one flower or fruit and the next, and that the flowering and fruiting branches were much elongated.

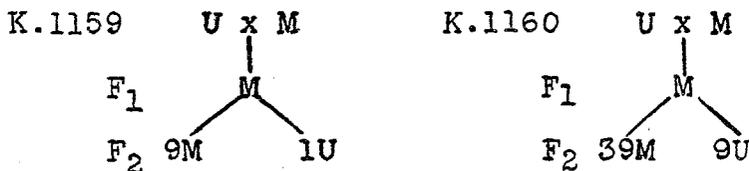
No reference to or description of a similar plant has been found in literature. The following diagram illustrates the arrangement of the leaves and fruits or flowers of a typical piece, not of the original specimen but from an F_2 generation referred to below. For convenience of reference this plant and those of its descendants showing similar characters are referred to below as *uniflora*. Plants with the common ebracteate, ebracteolate, and nearly or quite leafless type of inflorescence are referred to as *multiflora*.



Ripe berries occurred on the original specimen and seeds from three of these were sown in the Herbarium Experimental Ground at Kew. A dozen plants were raised of which two showed clearly the *uniflora* char-

acter. The remaining ten either had quite normal leafless inflorescences or such as showed a certain amount of "growing-out" of small vegetative shoots. It was reasonably assumed that the *uniflora* plants had been derived from selfed seeds, the others from seeds originating by cross-fertilisation between a *uniflora* female and a *multiflora* male gamete. Since *S. Dulcamara* is normally insect-pollinated and the fruits received were the result of open pollination, the results were such as might be expected. Branches of two of the *multiflora* plants correctly accepted as F_1 individuals, as indicated by the F_2 ratios, had a large number of flowers selfed artificially. These flowers were protected from insect visitors by means of insect-proof muslin cages. A considerable number of flowers failed to set seed, either because of a certain degree of self-sterility or because of the somewhat unfavourable conditions under the cages. A sufficient number of seed-containing fruits were, however, obtained to raise two F_2 families, one of which contained sufficient plants to give useful figures.

The *uniflora* character was invariably associated with retarded flowering, *uniflora* plants being at least two to three weeks later coming into flower than the *multiflora* plants growing with them. This was particularly noticeable the first year (1933) in which the F_2 families were scored. Since in 1933 several plants did not flower at all and in 1934 two plants scored in 1933 had died, the figures in the following diagrams are based upon two years' scorings.



Further details must be given before these figures can be properly appreciated. The plants scored as *uniflora* (U) were all clearly extreme forms with the flowers and fruits well separated by intercalated leaves or leafy shoots. The *multiflora* (M) plants, however, were not uniform in inflorescence structure, but showed all grades of development of leaf-bearing shoots from none or few to very many. In K.1159, three plants, and in K.1160, twenty plants were scored as showing marked "growing out." It was impossible to score these into classes because not only did different inflorescences on the same plant sometimes show different degrees of "growing out" but there was some variation from year to year. Only those plants which were clear-cut *uniflora* for two successive seasons were scored under that heading. Three plants scored as *uniflora* in 1933 were scored as *multiflora* showing extreme "growing out" in 1934. A comparable fluctuation was observed in the F_1 plants.

The *uniflora* plants were of slower, less robust growth, on the whole, especially in the earlier stages of their development. This is in agreement with their retarded flowering, and with the interpretation of the

uniflora character as a recessive. Even if the *multiflora* character be accepted as dominant over *uniflora* it is evident that the dominance is not always complete. This suggests the interaction of other factors—perhaps of modifying genes for which the (unknown) male parent may have been heterozygous. Further research on this interesting material might afford valuable data in relation to some of the theories discussed by Dr R. A. Fisher in his book *The Genetical Theory of Natural Selection* (Oxford, 1930).

The published accounts of the cytology of *Solanum Dulcamara* (C. A. Jørgensen in *Journ. Genetics*, xix, 194, 1928, and R. de Vilmorin et M. Simonet in *Zeit. f. Indukt. Abstamm. und Vererbungslehre Suppl.*, Bd. ii, 1521, 1928) give the haploid chromosome number as 12. There is considerable evidence that this is the basic number for *Solanum*. In *S. nigrum* haploid, diploid, triploid, and tetraploid plants have been proved cytologically. Unless such occur also in *S. Dulcamara*, and of this no published evidence has been traced, the ratios given above must be interpreted as those of normal diploids and not as examples of the more complicated ratios obtained from polyploid crosses.

One last matter remains for discussion: the light which the *uniflora* and intermediate types of inflorescence throw upon the normal *multiflora* type. The same type of apparent dichotomy is found in both, but in the former, instead of short leafless branches with rather crowded flowers, leaves with axillary buds are intercalated between the well-spaced flowers or fruits. It seems simplest to regard any flower as one branch of a dichotomy, equivalent morphologically to the apparent continuation which, instead of forking again almost immediately as in the normal inflorescence, behaves as a monopodium for some length. Thus the elongated apparent axis, partly leaf-bearing, partly flower-bearing, is composed in the *uniflora* plants of more or less alternating and overlapping sympodial and monopodial segments. The morphological equivalence of flowers and of leafy shoots is also evident in many of the intermediate types of inflorescence and can indeed frequently be seen in the ultimate branchings of ordinary *multiflora* plants occurring wild in Great Britain. Apparent examples of trichotomy can be interpreted either as one terminal and two lateral shoots, the latter of the same order, or, as seems much more likely from most of the examples examined, as due to two dichotomies of which one occurs almost immediately after the other. Thus the normal *multiflora* inflorescence is forked two or three (rarely more) times, the branches of these dichotomies being scorpioid cymes without bracts or bracteoles.

EXPLANATION OF DIAGRAMS.

Diagrams A to F constructed from an analysis of inflorescences of *Solanum Dulcamara multiflora* collected from a field near Sheen Common, Surrey, 4/8/1935.

A. The most usual type, may be considered as a standard, with two apparent dichotomies.

B. Unusual in that one "branch" (I) of the first apparent dichotomy has three small leaves (1) near its upper end and that a "branch" (III) of the second apparent dichotomy shows an apparent trichotomy at its upper end.

C. The first flowering "branch" (I) is on the right and a "branch" of the second apparent dichotomy shows a further apparent dichotomy (III and IV).

D. A "branch" (I) of the first apparent dichotomy has a very small shoot (s) with much reduced leaves, in place of a flower (5). A third apparent dichotomy has one "branch" (II) reduced to a solitary flower. This is given the ordinal value II only because it was in advance of any bud on "branch" III.

E. Showing an apparent trichotomy. A small bract (b) is indicated near the end of one "branch" (II).

F. A simple apparent dichotomy, not uncommon in small, few-flowered inflorescences.

The roman figures give the general order of the main inflorescence "branches," as judged from the general relative stage of anthesis of the flowers. The arabic figures indicate the order of opening of the flowers on any one "branch."

G. Diagram of the "inflorescence" in *S. Dulcamara uniflora*. The leaves are represented by elongated-oblong outlines, the larger with a longitudinal line; the fruits are represented by elliptic figures with a cross; the flowers or flower buds are represented by small circles.

b=branch; p=pedicel or petiole; s=scar.

Axillary buds occur in the axils of all the upper leaves, but are only shown when they are growing out into branches.

SOLANUM NIGRUM L. AND ALLIES.

C. E. BRITTON.

Solanum nigrum L. is one of those plants whose area of distribution has been profoundly enlarged by means of human activities. It is probably an intruder into the floras of the temperate regions of the globe, and not a very ancient arrival into Britain. It still retains the characteristics of a native of warm regions, making a tardy appearance above the soil, to flower only when summer is fully established, and it is still in bloom when the advent of early autumnal frosts proves fatal. Like most of the plants with which it associates, it is distinctly nitrophilous, abounding as a weed on loamy soils liberally treated with organic manures, especially where market-gardening is carried on, or in the vicinity of the same. On clay and chalk soils of the uplands, particularly where cereal crops are cultivated and inorganic manures used, the Black Nightshade is missing or infrequent. On rubbish dumps it is usually to be seen in profusion. Significant, as pointing to its known early place of growth in Europe, is that the plant is the *Solanum hortense* of the herborists, and, in consequence, the "Garden Nightshade" of early native botanical authors. As a common weed, it receives little attention from collectors, and the well-marked variations that exist attract notice only at rare intervals. Principal variations concern habit, foliage, and colour of fruit. It is chiefly the latter that has engaged interest in Britain, such deviations from the normal dark hue as green, yellow, yellowish-green, and red berries. Apart from variations in fruit-colour, the species presents several points of interest. For instance, a musk-like odour has been attributed to the flowers, a character that has hitherto eluded me. Although the plant is without any conspicuous hairs, yet the shoots are freely furnished with broad-based acute hairs, curved, and appressed to the surfaces of the stems and leaves, imparting a scabridity to the latter. Usually the branches are furnished with prominent ridges which originate at each side of the base of the petioles, are developed downwards, finally becoming indistinct. These ridges are tuberculate at intervals, each tubercle being surmounted by a stout hair curved at the base, then appressed. It is owing to the presence of the tubercles that the ridges are described by some authors as dentate. The inflorescences are extra-axillary, sub-umbellate, with the peduncle spreading or divaricate, the pedicels are reflexed before expansion of the flowers, afterwards becoming erect when the flowers open, and are finally reflexed during the ripening of the fruits.

Considerable diversity exists in the method of treatment of this species adopted by native floristic authors, as may be seen in the standard floras and plant lists. This may be due to inadequate knowledge

of the plants dealt with, for, as my own limited observations indicate, forms occur that transmit their distinguishing features whether of leaf or fruit, and even leaf-character and fruit-character may jointly descend unchanged. The following are the forms recognised in our two plant-lists:—

London Catalogue of British Plants, 11th ed. (1925).	British Plant List, 2nd ed. (1928).
1424 <i>nigrum</i> L.	2 1846 <i>nigrum</i> L.
b. <i>ochroleucum</i> (Bast.).	(<i>ochroleucum</i> Bast., p.p.).
c. <i>miniatum</i> (Bernh.).	b. <i>luteo-virescens</i> (Gmel.).
d. <i>littorale</i> Raab.	c. <i>humile</i> (Bernh.).
	d. <i>atriplicifolium</i> (Desf.) Dunal.
	e. <i>prostratum</i> F. Gér.
	f. <i>littorale</i> Raab.
	3 <i>miniatum</i> Bernh.

Comparing these lists, it will be seen that in the *London Catalogue* *S. ochroleucum* Bast. appears as a variety and that the red-fruited *S. miniatum* Bernh., treated as a species by Druce in the *British Plant List*, is also relegated to the lower grade.

The treatment of *S. nigrum* L. and its allies by Rouy in *Fl. Fr.*, x, pp. 364-7, deserves passing notice. *S. Morella* Desv. is the name adopted to cover *S. nigrum* in its widest sense. Under this is the sub-species *S. nigrum* (L., p.p.) Mill. with many black-fruited varieties.

Subordinate to this are the "races" (1) *S. ochroleucum* Bast., with four varieties marked by yellowish or greenish-yellow berries, and (2) *S. alatum* Moench, the red-fruited form. Sub-species *S. luteum* Mill. (as sp.) is the hairy plant with yellow berries that, as a "casual," is of very rare occurrence in Britain. The placing of the green and yellowish-fruited forms in a grade equal to that assigned to *S. alatum* Moench appears justified. Rouy's arrangement is referred to here, as Salmon, in his *Flora of Surrey*, appears to adopt the views of Rouy to the extent of placing Surrey records of Black Nightshade with yellow, bright green, or greenish-yellow berries to a var. *ochroleucum* (Bast.). Whilst perhaps it may be allowable to place diverse plants with various shades of green and yellow berries to *ochroleucum* when that is treated as a species or semi-species, it scarcely seems legitimate to place such plants under a var. *ochroleucum*, especially a dubious 17th century record of *Solanum* with golden berries.

(1) BLACK-FRUITED FORMS.

S. nigrum L., var. *vulgatum* Dunal in DC. Prodr., xiii, I, p. 50—Branches sub-terete. Var. *melanocerasum* Dun., l.c. =

S. melanocerasum Willd. Enum. Hort. Berol., p. 236 (1809)—Distinguished from the preceding by the angular dentate branches. Var. *atriplicifolium* Dun., l.c.—Marked by the sinuate-angular leaves = *S.*

nigrum, var. *sinuatum* Druce, *Rep. B.E.C.*, 1920, p. 33, 1921, p. 297. Var. *prostratum* F. Gér. in Magnier, *Scrinia*, p. 356 (1895)—Stem prostrate, leaves small, quite entire.

(2) GREEN, YELLOW, OR YELLOWISH-GREEN-FRUITED FORMS.

S. humile Bernh. in Willd., *l.c.*—Described as distinguished by its small stature, diffuse habit, lower leaves somewhat wavy entire, or with one or two teeth; the upper leaves entire, berries green.

S. ochroleucum Bast. in Desvaux *Journ. de Bot.*, iii, p. 20 (1814)—Characterised in the work mentioned as having strigose angular dentate branches, leaves ovate-oblong, sinuate-angular, somewhat hairy, berries yellow-green. The author stated that the plant grew about Anvers in the company of *S. nigrum* Willd., *S. humile* Bernh., and *S. miniatum* Willd. and that it differed from *S. humile* by reason of its erect stems two or three times taller, by the angles being well developed and dentate, by the more elongated deeply sinuate leaves and especially by the berries being variegated with green and yellow, and not of a uniform yellow as in *S. humile* [Willdenow, however, described the berries of the latter as *viridibus*].

S. luteo-virescens Gmel. *Fl. Bad.-Alsac.*, 4, p. 177 (1826)—Described by this author as marked by the angular asperous branches, leaves ovate undulate, and berries greenish-yellow. Under this name was included *S. humile* Bernh. Gmelin stated that his plant was closely allied to *S. luteum* Mill., from which it could be distinguished by the shorter stem with widely-spreading branches sub-angular and asperous, leaves less hairy and berry watery, greenish-yellow, but not yellow. A slight musk-like odour was present. Although it remained unaltered in cultivation, the suggestion was made that it was a hybrid between *S. luteum* Mill. and *S. nigrum* L. A variation with berries variegated yellow and green was referred to *S. ochroleucum*. The French botanist F. Gérard distinguished three varieties of this—a. *genuinum*—ripe berries of a greenish-waxen hue, stem erect, leaves sub-glabrous.—b. *citrinum*—ripe berries of a lemon colour, stem erect, together with leaves sub-glabrous.—c. *demissum*—ripe berries fully yellow, stem prostrate or ascending, stems and leaves sub-glabrous.

S. nigrum L., var. *chlorocarpum* Spenner *Fl. Frib.*, iii, p. 1074 (1829)—Simply described as having berries green when mature, *S. luteo-virescens* Gmel. being queried as synonymous.

S. nigrum L., var. *viride* Neilreich, *Fl. N.O.*, p. 535 (1859)—Described as having berries green, becoming yellowish.

(3) RED-FRUITED FORMS.

S. alatum Moench, *Meth. Pl.*, p. 476 (1794)—The author attributed to this rough angular, almost winged stems, leaves ovate, sinuate, sub-pilose, berries pale red.

S. miniatum Bernh. in Willd., *l.c.*—Described as having branches strigose-pubescent, angular, dentate, leaves ovate, undulate, glabrous. Said to resemble *S. villosum* Lam. (*S. luteum* Mill.), but differing in

branches destitute of spreading hairs and leaves glabrous or furnished with scattered appressed hairs and berries pale red.

S. puniceum Gmel. Fl. Bad.-Alsat., 4, p. 177 (1826)—Branches angular, asperous, leaves ovate, undulate, berries crimson. To this Gmelin placed *S. miniatum* Bernh. According to Gmelin, *S. puniceum* was not infrequent about Carlsruhe and elsewhere, in gardens, cultivated ground and waste places, usually occurring in the company of *S. luteum* and *S. nigrum*, of which he suggested it was a hybrid. He insisted that the berries were always crimson (*semper puniceae*) and not of a paler hue (*non miniatae*), hence the specific name adopted.

S. nigrum L., var. *rubrum* (Mill.) Brand in Koch Syn. Deut. u. Schw. Fl., iii, p. 2008 (1907)—Characterised by red berries, and said to be a very rare and doubtful plant, perhaps identical with *S. alatum* Moench.

BRITISH RECORDS.

S. nigrum L., var. *vulgatum* Dun.—There are specimens in herbaria that show the characters ascribed to this. It is, however, a form not hitherto encountered by me in the field.—Var. *melanocerasum* Dun.—A common British form whose name does not appear in our lists. Recorded by Druce from Oxford.—Var. *atriplicifolium* Dun. = *S. nigrum* L., var. *sinuatum* Druce, *Rep. B.E.C.*, 1920, p. 33; 1921, p. 297. Described by Druce as "a distinct plant with the leaf-outline of *miniatum* but with black berries, which at least deserves varietal rank." Recorded from Bradford, Abingdon, and Thetford.—Var. *prostratum* F. Gér.—Bristol, I. M. Roper, *Rep. Watson B.E.C.*, 1922-23, p. 219.

S. humile Bernh.—Recorded from Tweedside near Dryburgh in 1914.

S. ochroleucum Bast.—As previously mentioned, Surrey plants with berries yellow, bright green, or greenish-yellow have been placed to this.

S. luteo-virescens Gmel.—Recorded from solitary localities in Berkshire, Oxford, Kent, and Guernsey, and from the neighbourhood of Bournemouth.

S. nigrum L., var. *chlorocarpum* Spenner—Under this unequivocal name a green-fruited plant has been recorded from Surrey (*Rep. B.E.C.*, 1930).

S. miniatum Bernh.—As to plants with red-coloured berries, there are old records from Cornwall, Surrey, Kent, the Channel Isles, and a more recent one from Bristol. The records are meagre, and it is doubtful whether a red-fruited form has obtained a permanent footing in Britain. In Jersey the position is different, for there *S. miniatum* Bernh. seems established.

OBSERVATIONS ON LIVING WILD AND CULTIVATED PLANTS.

(1) *S. nigrum* L.—Oxted, Surrey. Tall, much branched, branches with prominent toothed ridges, leaves ovate-rhomboidal, sinuate-angular, light green, lamina decurrent upon the petiole, furnished on both surfaces with scattered acute broad-based appressed hairs; inflorescence 7-8 flowered, peduncle and pedicels erect in flower, peduncle divaricate in fruit and pedicels deflexed. Berries black, subglobose, 9 × 10 mm.,

savour disagreeable. Hairs on stems, branches, peduncles and pedicels appressed. Agrees with description of var. *melanocerasum* Dun.

(2) *S. nigrum* L., var. *chlorocarpum* Spenn.—Plants referred to this have been cultivated from two Surrey and one Sussex localities. From the last-mentioned county, Mr E. Payne sent me living plants in 1932, accompanied by the interesting note here reproduced. "*Solanum nigrum* is one of the commonest market garden weeds I know. Var. *chlorocarpum*, despite close observation over a wide area, I have only seen in one small spot, where it has been established for quite a few years. Its leaves are markedly different from those of *S. nigrum*, being sinuodentate to a degree I have never observed in the latter. This feature constitutes the principal difference between the two plants, as it enables you to distinguish the one from the other while the plant is as yet in flower. The fact that you can identify the plant before the fruits assume their proper colour appears to me to be very significant and inclines one to think that var. *chlorocarpum* is something more than a colour variant of *nigrum*." Unfortunately, the undulate, sinuate-dentate type of leaf referred to does not always accompany green berries, and examples of var. *chlorocarpum* from Hook and Godstone, Surrey were bearing plane leaves with angular serratures absent or few in number. The stems and branches of the Southwick specimens were furnished with prominent tuberculate ridges bearing appressed hairs. There was no suggestion of yellow in the green of the berries. At Godstone, Surrey, Mr A. Beadell found plants similar to those reported from Hook. Cultivation during successive seasons has shown that var. *chlorocarpum* remains unchanged. The plants raised from seed taken from the Southwick form were characterised by bright-green rhomboidal-ovate leaves, undulate, and as much angular-dentate as in *S. miniatum* Bernh., inflorescence 5-7-flowered, corolla 11 mm. in diam., fruit 9×10 mm., subglobose, with savour agreeable or nauseous. Plants derived from the Godstone gathering were marked by dark-green foliage, leaves plane, ovate-acuminate, entire, or sparingly dentate or sub-angular; inflorescence 4-6-flowered, corolla 14 mm., savour of fruit disagreeable. Although the mature berries are bright-green, eventually a slight yellowish tinge appears, owing to the berries becoming watery and the large mass of flattened yellowish seeds becoming visible beneath the pericarp.

(3) *S. miniatum* Bernh.—The following features were presented by cultivated plants grown from seed of Jersey plants. Smaller and more slender than any form with black or green fruit, stems and branches only slightly angled, angles by no means wing-like, in fact, less prominent than in *S. nigrum*, hairs on stems, branches, and leaves short, curved, appressed, scattered. A spreading pubescence is by some authors attributed to *S. miniatum*, a character not present in the Jersey plant. The berries differed from those of *S. nigrum* and var. *chlorocarpum* both in size and shape. In the two forms mentioned the berries are globose-depressed, about 9 mm. in height and 10 mm. broad, but, in *S. miniatum* the red berries are sub-globose, approaching an ovoid

form, being 7 mm. in height and 6 mm. broad. An unpleasant savour attaches to the berries. In all forms, the upper parts of the branches are clothed with sessile glands. Those of *S. nigrum* and var. *chlorocarpum* exhale the usual solanine odour when bruised, but, on pressure, a putrescent-like odour arises from the glands of *S. miniatum*.

SYSTEMATIC ARRANGEMENT.

Although the characters which separate the various-hued forms are not of outstanding importance, there is no reason to doubt that there are three series of true-breeding plants. It will be apparent from the number of described forms and from the characters depended upon, that identification is attended with difficulties, especially as suspicion may exist that certain names are synonymous. It is of interest to consider whether the forms with yellow or green fruit are mutants from black-berried plants or whether again they are fluctuations of one or more species or subspecies separable from *S. nigrum*. The former view appears doubtful, having regard to the recorded occurrence of "var. *luteo-virescens*" in as many as six localities in the Bournemouth neighbourhood. If all these forms are associated, it will be convenient to arrange them under the oldest existing name in the group. Already it has been mentioned that such a course was adopted by Rouy, but the group name fixed upon by that botanist, i.e., *S. ochroleucum* Bast., is antedated by *S. humile* Bernh., and, accordingly, that name is here employed.

As to the red-fruited forms, bearing the names *S. alatum* Moench, *S. miniatum* Bernh., and *S. puniceum* Gmel., it does not appear certain that these are strictly synonymous, although it is usual, outside Britain, to regard the two latter names as equivalent to *S. alatum* Moench. Yet, the original description of the latter, and modern authors' descriptions also, indicate a plant somewhat different from *S. miniatum* Bernh. In this case it is thought better to subordinate *S. miniatum* and *S. puniceum* as varieties under the older name *S. alatum* Moench. In the list that follows, the "var. *littorale* Raab" of the *London Catalogue* and *British Plant List* is omitted. The inclusion of this under *S. nigrum* L. is a curious error. It finds no entry in the *British Plant List* issued in 1908, nor in the 10th ed. of *The London Catalogue of British Plants* published in the same year. It first appears under *S. nigrum* L. in the 11th ed. of the *London Catalogue* (1925) and this error was reproduced in the *British Plant List*, ed. 2 (1928). The plant concerned is *Solanum littorale* described by Raab in *Flora*, ii, p. 414 (1819), as a new species distinguished from *S. Dulcamara* L. by the villous stems and tomentose foliage. It is synonymous with *S. Dulcamara* L., var. *tomentosum* Koch and *S. Dulcamara* L., var. *villosissimum* Desv. The trivial name refers to the locality where it was observed by the shores of Lake Lemán.

SOLANUM NIGRUM L.

Var. *vulgatum* Dun. in DC. Prodr. xiii, I, p. 50

Var. *melanocerasum* Dun., *l.c.*

Var. *atriplicifolium* Dun., *l.c.*

Var. *prostratum* F. Gér. in Magnier, "Scrinia," p. 356 (1895).

S. HUMILE Bernh. in Willd. Enum. Hort. Berol., p. 236 (1809).

Var. *typicum* = *S. humile* Bernh. (*sensu stricto*).

Var. *ochroleucum* = *S. ochroleucum* Bast. in Desvaux Journ. Bot.,
iii, p. 20 (1814).

Var. *luteo-virescens* = *S. luteo-virescens* Gmel. Fl. Bad.-Als., 4,
p. 177 (1826)—var. *a. genuinum* F. Gér. in Magnier, "Scrinia,"
p. 356 (1895).

Var. *citrinum* = *S. luteo-virescens* Gmel., *b. citrinum* F. Gér., *l.c.*

Var. *demissum* = *S. luteo-virescens* Gmel., *c. demissum* F. Gér., *l.c.*

Var. *chlorocarpum* = *S. nigrum*, γ *chlorocarpum* Spenn. Fl. Frib.,
iii, p. 1074 (1829).

S. ALATUM Moench Meth. Plant., p. 476 (1794).

Var. *miniatum* = *S. miniatum* Bernh. in Willd., *l.c.*

Var. *puniceum* = *S. puniceum* Gmel. Fl. Bad.-Als., 4, p. 177 (1826).

VARIETIES OF MELAMPYRUM PRATENSE L.

C. E. BRITTON.

In the course of study of the native forms of *Melampyrum pratense* L. it has been borne upon the writer that a revision of the varieties placed to this species is necessary. It is probable that there is no other British species which has had so many named forms ascribed to it as a result of examination of herbarium material apart from study of the living plants. No other species exemplifies to such an extent the weakness of the evidence afforded by non-living material. It is, I believe, not fully realised how inadequate herbarium specimens may be to illustrate the characteristics of a species, for there is always present with the collector a tendency to secure the most striking form seen to the neglect of the collection of the average form. In the case of annual social hemi-parasitic plants, as *Melampyrum*, some, at least, of the divergences seen among the communities may, with confidence, be attributed to differences in nutrition. Subject to unfavourable conditions, a plant may be more or less arrested in growth and so present the facies of a form otherwise absent. A plentiful supply of food-material may tend to develop characters, such as enlarged leaf-surfaces, that mark certain varieties. Study of the average form present would be decisive. It is on these lines that observation of the living plants would be likely to yield results of value.

In descriptions of the varieties and forms stress may be placed upon the number of pairs of intercalary leaves. Evidence on this point is best obtained by examination of numerous individuals from the same colony. The results are usually of interest. Thus, in var. *lanceolatum* Spenn. the intercalary leaves may be said to be 0-1-2 pairs, but communities show that these figures exist in varying degrees, as in the following instances. The figures are arranged in the order of descending frequency. (1) 1-2-0, (2) 1-0-2, (3) 1-2-0, (4) 1-2-0, (5) 0-1-2.

In previous papers, criticisms have been passed upon certain varieties appearing in the *British Plant List* and *London Cat.*, ed. xi, and in the writer's view, vars. *paludosum*, *foliatum*, and *brevidentatum* should not be employed to designate British plants, on present knowledge. It is not overlooked that in the first-mentioned list the various forms are arranged under two specific names, *pratense* L. and *vulgatum* Pers. As to the *Lond. Cat.*, the method adopted is unique, and no reference appears in the "Explanations of the Catalogue." Under *M. pratense* L. is a. *pratense* Beauv.—with varieties b. *scotianum*, c. *paludosum*, d. *montanum*, and e. *ericetorum*; and b. *vulgatum* Pers.—with vars. b. *britannicum*, c. *concolor*, d. *laurifolium*, e. *ovatum*, f. *lanceolatum*, g. *hians*, and h. *pseudo-silvaticum*. It is clear that the ultimate divisions are not formae but varieties. In the absence of any explanation the

grade of the two primary divisions is left in doubt. It is evident that in any new edition of the lists mentioned a drastic revision of the subordinate forms will be necessary. The attempt to arrange the forms of the common British Cow-wheat under two species or two subspecies fails to give satisfaction, and it would perhaps be better if the grade of subspecies were extended to several of the British forms.

Var. *britannicum* Beauv.—Plants so determined look by no means identical, and the characters ascribed to the variety present little to distinguish it from var. *lanceolatum*.

Var. *commutatatum* Beck and sub-var. *concolor* Schönheit.—There appears little to separate these as the contrasting characters here given indicate.

<i>commutatatum.</i>	<i>concolor.</i>
Calyx 7 mm. long, including teeth, 4-5 mm.	Calyx 5 mm. long, including teeth, 3 mm.
Corolla yellowish or whitish-yellow.	Corolla greenish-white and yellow or lemon-coloured.
Lower bracts entire or sub-hastate dentate at the base, upper bracts gradually becoming palmatifid-pectinate.	Lower bracts entire or only slightly toothed at the base, succeeding bracts hastate and more or less deeply falcate-dentate, uppermost palmatifid.

Both are typically broad-leaved forms (ovate-lanceolate) with conspicuous intercalary leaves (usually 3-5 pairs), and are usually of robust growth, in consequence of which they find representation in herbaria by incomplete examples only, and then usually under the name of "var. *latifolia*." The stout habit, and the presence of three or more pairs of intercalary leaves separate these two from allied forms.

Var. *concolor* Schönheit.—A description is given of plants found growing near Trotterscliffe, W. Kent, v.-c. 16, examples of which have been distributed through the Bot. Exchange Club (Ref. No. 4189). Stem stout, 2-3 mm. diam., c. 40-50 cm. in height, glabrous, apex inclined, nodes distant (40-60-120 mm.); cauline leaves 4-5 pairs all with branches from the axils, lowest branches more or less arrested, branches at middle of stem erect or ascending, floriferous, usually branched and not exceeding main stem; lamina of cauline leaves oval-lanceolate, acuminate, 70 × 15-18 mm., scabridulous, intercalary leaves 3-4 pairs, oval-lanceolate, acuminate, c. 65 × 18 mm., scabridulous, about 50 mm. distant. Inflorescence commencing at 8th-9th node, lower bracts similar to intercalary leaves, rounded and with 2 pairs of slight teeth at base, intermediate bracts lanceolate-hastate more dentate at base, decreasing in size, apical bracts palmatifid, mid-lobe largest. Flowers c. 13 mm., calyx-tube 2 mm., teeth 3 mm., scabridulous.

Var. *digitatum* Schur, Enum. Pl. Transs. (1886), p. 506, described by that author as having a stout much-branched stem, branches widely spreading, flowers in elongated racemes, with large palmatifid bracts. As noted in my previous paper (*Rep. B.E.C.*, 1935), there are not in

the Druce Herbarium any plants determined by Beauverd as *digitatum* without qualifying remarks.

Plants found growing near Shoreham, W. Kent, by Mr A. Beadell, have been identified as this variety and distributed through the Bot. Exchange Club, 1935. The characters of these plants are shown in the following description. Plant c. 40 cm., stem erect or flexuose, 3-4 mm. in diameter, purplish, glabrous below, goniotrichous above; nodes 30-45 mm. distant, branches arising from axils of all cauline leaves, spreading or ascending, the upper equalling or exceeding main stem, and again branched, all flowering. Cotyledons absent at flowering time. Cauline leaves oval-lanceolate, acuminate, 75-85 × 15-20 mm., about 5 pairs, spreading, scabridulous; intercalary leaves 1-2 pairs or 0, oval-lanceolate, acuminate, 65 × 15 mm., scabridulous. Inflorescence commencing at 7th node, lowest 1-2 pairs of bracts oval-lanceolate 50-80 × 20-24 mm. entire, reflexed or spreading, succeeding bracts oval-lanceolate, hastate at base, upper bracts deltoid, 12-15 × 12-18 mm., palmatifid, lobes linear-lanceolate, acuminate, median exceeding lateral. Calyx pale-green, spotted with purple, tube 2 mm., lower teeth straight, 3 mm., upper teeth curved-erect, 3.5 mm. Corolla 16 mm., uniformly yellow or tube paler, lip deep yellow, tube occasionally becoming purple. A large robust form notable after the fall of the corollas for the numerous contiguous pairs of spreading deeply palmatifid bracts that give a bristling appearance to the apices of the stem and branches.

In Beauverd's Monograph, the name *digitatum* appears as a group name for a series of formae. These are:—

(1) f. *laciniatum* (Kosh. et Zing.) Beauv. = *M. laciniatum* Kosh. et Zing. in Bull. Soc. Nat. Moscow, 56 (1881), I, p. 313 = *M. pratense* L., var. *laciniatum* Rouy, Fl. Fr., xi, p. 125 (1909). The latter author distinguishes his variety as having bracts broader than in the type, and divided into elongated lanceolate divisions that exceed the breadth of the central disk, a description that would apply to the W. Kent plants previously described. It is, however, doubtful whether the plants of Western Europe will prove identical with the Russian *M. laciniatum* Kosh. et Zing. which was suggested by the authors of the name to be possibly a hybrid between *M. pratense* L. and *M. nemorosum* L., the latter a non-British species.

(2) f. *murorum* Beauv.—A plant of stony places, described as smaller than the preceding, with spreading, simple, or slightly compound branches. Not recorded for Britain.

(3) f. *ovatum* (Spenner) Beauv.—Already dealt with in *Rep. B.E.C.*, 1934.

(4) f. *lancoletatum* (Spenner) Beauv. = *M. pratense* L., var. *lancoletatum* Spenner Fl. Frib., ii (1826), 367.

(5) f. *extremum* Westerlund.

(6) f. *divaricatum* Kerner ex O. Dahl in Blytt's "Haandb. Norges Flora" (1906), p. 642.

Nos. (5) and (6) are plants closely related to No. (4), from which they are distinguished, according to Beauverd's key to the forms of *M. pratense*, by geographical distribution, *lanceolatum* being a plant of Central Europe, *extremum* and *divaricatum* confined to Scandinavia. They are mentioned here as there is reason to believe that they occur in Britain or are represented by closely allied forms.

Var. *lanceolatum* Spenn.—This is the most frequently met with representative of *M. pratense* L., at least in Southern Britain. It varies chiefly in leaf-dimensions, the extreme condition being f. *laurifolium* nihi = *M. pratense* L., subsp. *vulgatum* (Pers.) Beauv., var. *vulgatum* (Pers.) Beck, sub-var. *laurifolium* Beauv. Monogr., 483, 507. A description drawn-up from plants authenticated by Beauverd, appears in *Rep. B.E.C.*, 1934, p. 915. The name *laurifolium* was brought into being to designate British plants erroneously referred to var. *latifolium* Schueb. & Mart. It would be incorrect to assume that all native plants named by collectors var. *latifolium* are identical with Beauverd's *laurifolium*. Examination of herbarium material shows that any form of *M. pratense* with notably broad leaves was liable to be identified with var. *latifolium*, and most of the plants formerly so named would come under one or other of the forms named by Beauverd as *commutatum*, *concolor*, *ovatum*, *digitatum*, or *lanceolatum*. It is, however, with the last-named that plants determined by Beauverd as *laurifolium* are most closely connected. They appear to be nothing more than a broad-leaved form of var. *lanceolatum* Spenner.

In coppices recently cleared of undergrowth, plants of var. *lanceolatum* may at times be seen which have developed a rather unusual aspect. The stem remains short with contracted internodes and numerous short branches spreading outwardly. This condition is probably due to the prevailing environmental factors, and is likely to be transient only, disappearing as the undergrowth is renewed. The two following forms have already been referred to under var. *digitatum*.

M. pratense L., f. *extremum* Westerlund in Bot. Notis., 1904, pp. 7-8.—Described by the author as a robust form with 3-5 pairs of ascending branches often equalling the stem, bracts cuneate or abrupt at base, with 2-4 elongated slender teeth, and calyx hairy, not merely ciliate. Beauverd describes it as having a stem about 35 cm. in height, 3-5 pairs of rather broad cauline leaves, branches arcuate, intercalary leaves 2-3 pairs. Recorded by Westerlund from Vastergötland. Plants occur in Surrey closely agreeing with the above descriptions, but further study is necessary.

M. pratense L., * *vulgatum* (Pers.), f. *divaricatum* (Kern. in herb.) Ove Dahl in Blytt Haandbog I Norges Flora (1906), p. 642, who described it as a form with very wide-spreading branches, narrow leaves, and entire or slightly toothed bracts. According to Beauverd's description, it is about 20 cm. in height, slightly branched, branches divaricate, cauline leaves rather narrow (40 × 3-5 mm.), rarely 6-8 mm. wide, intercalary leaves 0 or 1 or 2 pairs. The cotyledons are absent at flowering time, the stem branched at the lower 3-4 nodes, branches

simple or slightly branched, bracts dentate-palmatifid; inflorescence beginning at nodes 4th to 6th; calyx glabrous, tube short, teeth arcuate-filiform, corolla golden, about 13 mm. long. The distribution is given by Beauverd as Suecia and Lapponia. In Epping Forest, Essex, v.-c. 18, the only form of *M. pratense* L. hitherto seen by me—and that in two separated localities—is one that so closely agrees with the descriptions of Dahl and Beauverd that I see no reason to refrain from naming it *M. pratense* L., f. *divaricatum* Kern. ex Dahl, *l.c.* As similar plants may be met with elsewhere, a full description follows. Plant c. 20-30 cm. in height. Stem 1 mm. in diam., flexuose, glabrous, lower nodes 10-20 mm. distant; cotyledons oblanceolate-oblong, 17 × 4 mm., persistent till fruiting time in small plants, deciduous earlier in larger plants; cauline leaves lanceolate-linear, acuminate, 60-70 × 5-8 mm., hispidulous, spreading, all bearing branches in axils, branches spreading at right angles, 28-40 cm. in length, usually with secondary branches spreading at a similar angle, all flowering and prostrate, intercalary leaves 0-1-2 pairs, resembling upper cauline leaves. Inflorescence commencing at 4th-6th nodes, lower pairs of bracts lanceolate-linear entire, 70 × 5-10 mm. (rarely 80 × 15 mm.), intermediate bracts linear-lanceolate, falcate, decreasing in size, pectinate at base, teeth 2-3 pairs linear-lanceolate, apical bracts linear-falcate, smaller, basal teeth 1-2 pairs, ascending or divergent. Flowers c. 12 mm., calyx glabrous, tube 2 mm., teeth 3 mm., linear-setaceous, ascending corolla yellow.

PLANT NOTES.

†33/1. *MATTHIOLA INCANA* Br. In plenty with whitish flowers on cliffs above the railway near Dover; one plant with violet flowers on the cliffs between Dover and St Margaret's Bay, E. Kent, v.-c. 15, J. P. M. BRENNAN.

†70/2. *Vogelia apiculata* (Fisch., Mey., et Avé Lall.) Vierhapper in Oesterr. Bot. Zeitschrift, lxx, 169 (1921); Hayek, Prodr. Fl. Penins. Balcan., i, 484 (1925). *Neslia apiculata* Fisch., Mey. et Avé Lall. in Ind. oct. sem. hort. Petr. (1842), p. 68.

St Philip's Marsh, Bristol, West Gloucester, v.-c. 34, June 1905, J. W. WHITE, vide specimens in *Herb. White* in *Herb. Univ. Bristol*.

Distribution: Mediterranean Region and the Orient.

This species closely resembles the well-known *V. paniculata* (L.) Hornem. of our rubbish-tips and chicken-runs, but is immediately distinguished by characters of the fruit. This, in *V. apiculata*, is up to 2.8 mm. wide, and conspicuously cuspidate both at the base (where it is distinctly narrowed) and at the apex beneath the style, while definite longitudinal ribs tend to form amongst the reticulation of the surface. In *V. paniculata*, on the other hand, the fruit is up to 2.5 mm. wide, and rounded or rounded-truncate at both ends, with only a very minute apiculus beneath the style, while the reticulation of the surface does not form longitudinal ribs. The fruits of *V. apiculata* are also regarded as more compressed and sublenticular than those of *V. paniculata* which are described as subglobose, and they tend to be as long as broad, whereas those of *V. paniculata* are broader than long. *V. apiculata* is definitely Mediterranean in distribution, whereas *V. paniculata* is more a plant of Central Europe and the North Temperate Regions. The species are so alike that all British botanists should examine their material closely. Present evidence suggests that *V. apiculata*, in spite of its Mediterranean origin, is the rarer of the two as an adventive, since all the British sheets at Kew, and all the other Bristol specimens which have been examined, are to be referred to *V. paniculata*. The Kew material of *Vogelia* has recently been carefully sorted and re-arranged by Dr W. B. Turrill, and it is remarkable to see how few authors and collectors have succeeded in recognising *V. apiculata*, although it has occasionally been segregated under other, later, names such as *Neslia thracica* Velenovsky, *N. hispanica* Porta, or *Vogelia paniculata*, var. *thracica* (Vel.) Bornm.—C. I. and N. Y. SANDWICH.

80/2. *RAPHANUS MARITIMUS* Sm. Southwick, W. Sussex, v.-c. 13. Specimens of a very abnormal plant have been sent to Kew, who report

as follows:—"The specimen enclosed was an interesting example of *R. maritimus*, showing virescence and partial phyllody of the flowers, that is, the normal flower parts are replaced by green organs partially simulating much reduced foliage leaves. We have no record of a similar abnormality in this species, though there are several records published of parallel abnormalities in at least one other species of the genus. These phylломorphic flowers, as well as occurring at the usual intervals in the raceme, were also on other stems crowded together in dense heads, and in a manner quite foreign to the usual growth of the plant." L. A. W. BURDER.

†467/3b. ANAGALLIS FOEMINA Mill., var. *Allionii* Rouy Fl. Fr., x, 181, 1908. Splott, Glamorgan, v.-c. 41, E. VACHELL. This has verticillate leaves in whorls of threes.

558/. THE COLLECTION OF MINTS. The writer has recently sent some specimens of Mints to Herr R. Trautmann of Budapest, in the hope of clearing up the uncertainty attaching to the identification of *Mentha nemorosa* Willd. Herr Trautmann has very kindly sent a drawing showing the important characters of the plant upon which he relies, and also actual portions of a specimen. In the course of his accompanying letter he makes some remarks upon the collection of specimens which it seems desirable to bring to the notice of field botanists. The following is a free translation:

"With reference to my help in the elucidation of the British Mints, my humble powers are at your disposal, but I must have for examination complete and ample material, for in the case of so critical a genus, little can be done with single specimens when the Mint-flora of the region has not yet been worked out. The plants collected must be as complete as possible, showing clearly the middle stem-leaves and the terminal inflorescence; otherwise they cannot be determined.

"You could render a great service to science, if you would make a collection of the wild Mints of the British Isles. For this purpose, it is less useful to collect single specimens from numerous localities, than to procure a full supply of examples from a few areas which are rich in Mints. I have obtained the best results by collecting some hundreds of specimens from an area of at most 4 or 5 square miles; in this way one can get the best idea of the prevailing types, and determine the hybrids; while a few single specimens from such an area often allow of no certain determination.

"In the preparation of specimens, the only care to be taken is to see that measurements of the stem-leaves can be made; the setting of the leaves should not be altered, as it is often characteristic of a variety; while curved and longitudinally-folded leaves should not be flattened out. In short, the natural habit of the plant should be preserved as far as possible. The gumming-down of specimens renders the task of determination much more difficult, and is superfluous in private herbaria.

" If I am to be of any assistance to you in the working out of the British Mints, I must have a plentiful, well prepared collection in accordance with the above directions. so that I may be able to get a sufficient knowledge of the English Mint-flora, of which at present I know little. Existing herbarium material would not be of much use, as most botanists, not realising the rules which are made necessary by the critical nature of the genus, only collected Mints casually and often imperfect specimens thereof; so that even the largest herbaria give no certain view of the Mint-flora of individual regions. The English Mints must be newly and abundantly collected, if they are to be worked out with certainty."

Well, I am doing my best. Herr Trautmann is certainly right about the importance of collecting "populations" rather than outstanding specimens. He himself is faced with the fact that Hungary contains hundreds of *M. longifolia* forms, which hybridise freely; by getting all the forms from a small area, he feels that he can distinguish what he calls the "types" from their hybrids. As he already recognises 30 or 40 "types," he has his work cut out.

A. L. STILL.

558/4d. NEW AND INTERESTING MINTS. *Mentha viridis*, var. **rugosa** Gadeceau. *M. amaurophylla* Timb., var. β *rugosa* Rouy. In early September of 1934, I came across a Mint at Grafham, Surrey, which I took to be a form of *M. cordifolia* Opiz (*M. spicata* \times *rotundifolia*). Specimens were distributed by Mr E. C. Wallace, and came to Mr J. Fraser for comment. In his opinion the plant was *M. cordifolia*, and he suggested that it was near his variety *dourensis*. With this view I could not agree; the characteristic feature of var. *dourensis* is the long, slender spike; the spikes of the Grafham plant are short and stout. There are also differences in leaf-shape and stature. While looking through the Mints in Gadeceau's Hbm. at the British Museum, I found sheets of a Mint which correspond very closely with the Grafham plant, labelled as above. These were, with one exception, cultivated specimens, so I collected cuttings in early summer this year and grew them in my garden, in good clay-loam. In this way I was able to get specimens with good lower leaves, and these correspond even better with Gadeceau's sheets than the wild plant. There are small differences, but these are less than may be seen in specimens of, say, *M. spicata*, from different stations; and, in fact, less than those between the wild and garden specimens. The spikes of Gadeceau's plant are slightly longer than those of the Grafham plant, and the whole plant a little more compact with shorter foot-stalks to the lateral spikes. While these differences are not, in my opinion, important enough to invalidate the identification, they have perhaps some value when considering the possible origins of the colony. Last year, there was a single flowering spike of *M. alopecuroides* Hull in the middle of the very diffuse group of *M. amaurophylla*, var. *rugosa*; this year I could see no trace of it. The two Mints have some points of resemblance, but the latter is subglabrous. The likeness was observed

by Rouy, who gives a number of characters by which the two plants can be distinguished; he refers, of course, to the typical plant which has downy leaves and not to the variety; but the likeness is still there, and was noticed by several botanists when examining my specimens. Their opinions can be referred to in the Exchange Report of the B.E.C., 1934. Mr Pugsley saw the plant at Grafham in August this year and expressed the opinion that it could well be a hybrid between *M. spicata* and *M. alopecuroides*. That it should be an importation seems improbable; its distribution in France is very local, and I have not seen any specimens other than Gadeceau's in either British or foreign collections. It is a vigorous grower and spreads even more than *M. alopecuroides*, a fact which points rather to a hybrid than to a sport. It grows among brambles at Grafham, and reaches in some cases some 5 feet in height. In the garden under open conditions it grows well over 3 feet; the usual forms of *M. cordifolia* Opiz do not attain nearly this height. There can be no doubt that *M. spicata* and *M. rotundifolia* are concerned in its parentage. The scent is that of *M. spicata*, somewhat coarse. The stamens are strongly exerted. Flowers purple.

Gadeceau gives the following description:—" *M. viridis* L., 1. var. *rugosa*. Stem glabrous; leaves oval-elliptic, 25 to 40 mm. long, ending in an acute point, simply serrate, with unequal convergent teeth, wrinkled-rugose, deep green, glabrous above, slightly pubescent on the veins below, sessile or sub-sessile, with cordate base; spikes several at the summit of the stem, lanceolate, with compact whorls, the lower only spaced; calyx teeth lanceolate subulate, slightly ciliate; bracts linear lanceolate; appears to be fertile. Cultivated at Piriac (Loire Inf.) and the neighbouring villages as a seasoning for Limpets under the name of 'Limpet Mint.' Rouy (*Fl. de France*) connects my plant with *M. amaurophylla* Timb. as var. *rugosa*. My plant has not small, but cordate leaves. But the suspicion of hybridisation between *M. viridis* and *M. rotundifolia* seems to me plausible enough."

This description could not be bettered for the Grafham Mint. In the garden the leaves measured as much as 10 cm. in length.

A. L. STILL.

558/4e. *MENTHA SPICATA* Huds. Coldharbour Common, Surrey. In the Distributor's Report, 1934, this plant is mentioned as being contributed by Mr E. C. Wallace. Mr Fraser says, "The height of the stems and the narrowness of the leaves are notable, and I hope Mr Wallace will give an opinion as to any local causes that may have contributed to these excellent results."

This plant is in my opinion *M. spicata*, var. *angustifolia* Lej. = *M. Lejeuneana* Opiz and *M. spicata* Huds., var. *stenophyllon* Top.

In the same Report, Mr J. E. Lousley, speaking of his *M. longifolia* Huds., var. *pulverulenta* Strail, says, "The only other British station known to me is Tadworth, Surrey," etc., etc. In my view, these two plants are not identical. Among the forms of *M. longifolia* described by Topitz, the nearest to *M. pulverulenta* Strail seems to be

M. longifolia, var. *recta* (D.D.) Top., while the Tadworth plant has narrower leaves and is very near *M. Dossiniana* (D.D.), which Topitz puts (p.p.) under var. *jurana* (D.D.) Bq. I have seen sheets of *M. Dossiniana* and they agree well with the Tadworth Mint, of which I have another specimen from a local garden. According to Topitz, the same variety can occur either in the green or pulverulent state, even in the same colony.

In *Rep. B.E.C.*, 1932 (Plant Notes), Mr Fraser described a plant collected by Miss E. S. Todd at Sebergham, Cumberland, as a new variety under the name of *M. rubra* Sm., var. *Toddiana* Fraser. Subsequently he identified a Mint from Tresamble, W. Cornwall as the same variety. I had occasion to examine the specimens of these plants in Mr Fraser's Hbm. at Kew, and have regretfully to pronounce them to be both *M. piperita*, with the typical scent. I called Dr Turrill into consultation, and he agreed. In fact, the Sebergham plant is the exact double of a specimen of *M. piperita* collected in N. Aberdeen by Mr Fraser himself; the Cornish plant is a slightly different variety, but both, I think, could go under *officinalis* Sole. If a further differentiation is required the Sebergham plant could be called var. *poicila* Top., on account of its broader leaves. Topitz would, I think, include var. *subcordata* Fraser, with leaves rounded at the base, in the same variety.

A. L. STILL.

558/7×4. MENTHA AQUATICA L. × M. SPICATA Huds. The only Mints which are generally accepted as arising from this cross are the various forms of *M. piperita* L. From *M. aquatica* are derived the long petioles and habit of branching, and from *M. spicata* the spicate inflorescence and generally glabrous condition, and, presumably, the characteristic aroma. In addition to these forms, Topitz includes *M. citrata* Ehrh. as a variety. Several forms of Mint have recently come to my notice, which suggest that they are of the same parentage. To call them varieties (or forms) of *M. piperita* would probably lead to much misunderstanding, as this name has for so long been associated with Mints of a very special character. If, on consideration, the forms I shall mention are accepted as the same hybrid, they could be included with the Peppermints under some general name, such as, e.g. *M. aromatica*, in the same way as the *M. longifolia* × *M. aquatica* hybrids have been grouped under *M. dumetorum* Schultes. Most of the forms are rare, and I have not been fortunate enough to see all of them fresh; and under present conditions they remain as individual "problems."

1. *M. citrata* Ehrh. I think the inclusion of this is justifiable. It is usually almost completely glabrous, and the heads are less definite than in *M. aquatica*. The peculiar scent of bergamot is not confined to the true plants, as has been noted before. I think even Sole must have been confused about this, as he makes a statement in his well-known work that "*M. odorata* flowers at the end of July." *M. citrata* is one of the latest Mints to flower, not being at its best till well into September, like most of the Peppermints. His figure is quite correct for *M.*

citrata Ehrh. Possibly he had more than one form among his *M. odorata*. Certainly *M. citrata* lies very close to *M. aquatica*; the next form to be mentioned shows a further departure from this parent.

2. In "Plant Notes," *B.E.C. Rep.*, 1922, Dr Druce speaks of a specimen in his collection, gathered in 1843 by W. H. Coleman at Roydon, Herts, and labelled *M. citrata* Ehrh. Mr Fraser saw this specimen and thought it might be a hybrid, *M. citrata* × *M. rubra* Sm. I do not think it has been referred to since. I collected this plant on August 29th and September 29th, 1935, so it is a late-flowering form. In appearance it is a glabrous *M. aquatica*, with the characteristic odour of the species; but the inflorescence is a spike, varying in length, and more or less spaced below, as in *M. piperita*. The flowers suggest *M. rubra* Sm., but there is no indication of *M. arvensis*. The uppermost pair of leaves, subtending the first pair of floral cymes, is large. One stem bore an unusual inflorescence, this being branched, and strongly suggesting a rather poor specimen of *M. piperita*. It seems quite reasonable to suppose that this plant is a form of *M. aquatica* × *M. spicata*, of the same order as *M. citrata* Ehrh. Both the supposed parents grow fairly near, but I saw no *M. rubra* Sm. I have the plant under cultivation. It is almost entirely glabrous, even to the calyx teeth.

3. Mr N. D. Simpson and I collected a Mint by the Avon above Aveton Gifford, S. Devon, in August 1935. The leaves were elliptic, tapering to both ends, coarsely serrate, subglabrous, with long petioles. The inflorescence was sub-spicate, stout and blunt; calyx tubular, glabrous with a few hairs on the calyx teeth. There is a look of *M. piperita* about it, but it is less freely branched than is usual in that form and the scent is not typical, but more like that of *M. gentilis*. It is more of an intermediate in appearance than the forms previously referred to, and I cannot suggest any other parentage than the one we are considering. The accompanying Mints, which were not very near, were *M. aquatica*, *M. rotundifolia*, *M. verticillata*, and two forms of *M. gentilis*, both with included stamens. This character renders it unlikely that this last Mint is concerned directly; but the presence of *M. gentilis* goes to show that there must be, or have been, some *M. spicata* not too far off. There are houses within bee-range.

4. Mr G. M. Ash sent me for inspection a Mint from Bedwyn Brailes, Wilts, which had been shown to Dr Druce. His report was that it had the facies of *M. piperita*, but was too hairy for this and smelt like *M. spicata*. I told Mr Ash that so far as I could see it was an aberrant *M. piperita*; that is to say a hybrid of *M. aquatica* × *M. spicata* which had not the peppermint odour. I have not, so far, seen the fresh plant.

5. Dr Druce collected specimens from several localities in Scotland which he called *M. Fraseri*, and suggested that they were hybrids between *M. aquatica* and *M. piperita*. He says that they have leaves of varying degrees of hairiness, and less elegant in shape than those of *M. piperita*. If his view is correct these plants would come within the limits of the hybrid we are considering (*Rep.*, 1927, p. 315).

6. In "Menthae Britannicae," Mr Fraser suggests that *M. crispa* L. may be the same hybrid (*M. spicata* × *M. aquatica*). The peculiar lacinate form of the leaves is found in more than one species. *M. undulata* K., a *longifolia* form, shows this character, and also *M. spicata*, var. *lacerata* (Op.) Fraser. Topitz puts *M. crispa* L. as a var. of *M. aquatica*; I have seen a capitate form in the Brit. Mus. Hbm., which would justify this opinion; and also a verticillate form. Whether our plant from Wooler and elsewhere is the same as Topitz's plant is uncertain; the specimens I have seen dry are shortly spicate, or apparently so. Not having seen the plant fresh, I cannot express any opinion; the odour should give a good idea of the presence or absence of *M. spicata*.

The French botanist, Lloyd, attempted to cross these two species, and raised a number of seedlings. Some of these are to be seen among Gadeceau's Mints in the Brit. Mus. They are very varied in appearance, and in some cases the origin would hardly be guessed. So far as I remember, none of them are obviously Peppermint. In most, if not all, cases the seed-parent was *M. spicata*; but, unfortunately, Lloyd grew many kinds of Mints, and, judging from comments by contemporaries on the sheets, he was not very critical in his experiments; the pollen parentage is therefore not too certain.

A. L. STILL.

558/10j. *MENTHA GENTILIS* L., var. *Vesana* Lej. & Court. In South Wales last year I found a form of *M. gentilis* L., which differed a good deal from the plants which occur in Surrey and the eastern counties. On comparison I came to the conclusion that it was the same form which F. H. Davey and others collected in Cornwall, and which the late Arthur Bennett identified as *M. gentilis*, var. *Pauliana* F. Schultz. These Mints are much too hairy to agree with Schultz's description of his variety, which is said to be subglabrous; nor do they much resemble his type-sheets at Kew and S. Kensington. From the description given in Strail's "Classification," I had suspected that they might be var. *Vesana* of Lejeune and Courtois, which Strail identifies with *M. Crepini-ana* (Dur.) and *M. postelbergensis* (Opiz). In Gadeceau's collection at S. Kensington there are sheets of *M. gentilis*, var. *Vesana* L. et C., which agree so closely with my plant from S. Wales that I have no doubt that this and the Cornish plants are to be placed under this variety or "form." Topitz (*Bot. Cent. Blatt.*, 1913) includes this in var. *stricta* (Beck.).

A. L. STILL.

730/1c. *ALISMA RANUNCULOIDES* L., var. nov. *angustissima* E. Vachell. Planta erecta nana. Folia omnia angustissime lanceolata petiolata. Laminae ca. 1-2 mm. latae, 15-20 mm. longae. (Folia primaria submersa linearia). Scapus 3-8 cm. longus, pedicelli 15-20 mm. longi. Carpelli obovati costati. Semina obovata atra. Typus in Herb. Mus. Brit. Kenfig Pool, Glamorgan, 7/8/1935.

The above description was drawn up from 30 plants deposited in the British Museum. They are never stoloniferous and very uniform in

leaf-width, the maximum width of the laminae being usually 1.0-1.5 mm. Abundant fruits are produced, distinctly tapering below and never sterile. According to Mr W. H. Pearsall no similar form has hitherto been described. Most of the following are merely ecological states: var. *natans* Gluck, all leaves floating, plant nearly always sterile; var. *zosterifolius* Fries, all leaves submerged, plant usually sterile; var. *terrestris* Gluck is a sub-terrestrial form with a rosette of aerial leaves. The var. *repens* (Davies) is always stoloniferous.

The plants grow abundantly in damp slacks on the Kenfig dunes and in small patches of water near Kenfig Pool in both of which situations the water-level varies considerably from year to year and even during different seasons of the same year. For this reason the same area which at one period of the year may be covered with lagoons full of the submerged forms of *Potamogeton gramineus*, *Apium inundatum*, *Polygonum amphibium* and *Ranunculus peltatus* may, when visited a few months later, be perfectly dry, and its exposed surface covered with the terrestrial forms of the same species. The water of Kenfig Pool is fresh, not brackish, and a certain amount of lime is present in the sand of the neighbouring dunes. This accounts for the abundance of *Hutchinsia petraea* on them.

E. VACHELL.

737/9×2. *P. GRAMINEUS* L. × *POLYGONIFOLIUS* POURT. (*P. SEEMENII* Asch. et Graeb. Syn. Mitteleur. Fl., i, 1897, 335, var. *LANCEOLATIFOLIUS* (Tis.) Hagstr.).

This very rare hybrid has only once been previously recorded from the British Isles—see B.E.C. 1922 Rep., 631-2 (1923)—but recently Dr W. A. Sledge has sent me specimens gathered by him at Ballymalis, Co. Kerry, in August 1935. This station must be near that from which Dr Druce and Mrs Wedgwood collected the hybrid in 1921. It is extremely rare, even in Sweden, and as it is very similar to *P. gramineus* L., var. *graminifolius* (Fries) may be easily overlooked. It is, however, quite distinct and affords indubitable evidence of the influence of *P. polygonifolius*. The following description has been drawn up from the British plants collected by Dr G. C. Druce and Mrs Wedgwood, those of Dr W. A. Sledge and the scanty descriptions of Swedish material given by Dr Tiselius and Dr J. O. Hagström.

×*P. SEEMENII* Asch. et Graeb. Stem elongated, branched, internodes fairly long—the lower and median ca. 8-10 cm.—with the habit of *P. graminifolius* Fries. Submerged leaves linear-lanceolate or broadly lanceolate, very gradually tapering from a rounded semi-amplexicaul base to an acute apex which is equally attenuate or shortly acuminate. Sometimes the base is tapering (lanceolate) and more or less decurrent, and occasionally the leaves are shortly but distinctly petiolate (up to 7 mm.). (This last character does not occur in *P. gramineus*). The majority are 7-veined, the midrib is broad, conspicuous and reticulate. The venation is very variable, even in the same leaf. The margins are generally *entire* but in many leaves they show *very few and exceedingly*

minute and irregular denticulations. In a few of the younger leaves of one of Dr Druce's specimens (W.880) these are *quite numerous and well-marked near the apex.* As a rule the leaves are long (to 10 cm. \times 1 cm.), thin in texture, dark green.

The floating leaves are coriaceous, very uniform in shape, elliptic to elliptic-lanceolate, equally tapering to each end and very longly petiolate (5 cm.). Lamina ca. 6.0 cm. \times 1.5 cm. The apex is acuminate. A few of the leaves show an asymmetric base—one margin being distinctly more curved than the other. (This character is frequently found in the fruits of hybrid Carices). The size varies between 5.0 \times 1.0 cm. and 6.5 \times 1.5 cm. The flowers are normally sterile, the peduncle swollen and the spike \pm 17 mm. long, in those seen.

It has been thought that specimens collected by W. H. Beeby from Brousta Loch, Shetland, and described in his paper on the Flora of Shetland (*Scottish Naturalist*, January 1891) may have been the hybrid, *P. Seemenii*, as they are labelled "*P. polygonifolius* \times *heterophyllus*" by the collector. They are now in Hb. Beeby (No. 1077) at the South London Botanical Institute, and were kindly sent me for examination. They afford not the slightest evidence of the influence of *P. gramineus*, and I have no hesitation in referring them to *P. polygonifolius*. Similar plants collected by R. W. Scully in the Long Range, Killarney, 1888, and mentioned in the *Journ. Bot.*, April 1890, are now in Hb. A. Bennett at the British Museum. I have carefully examined them and consider them to be unquestionably *P. polygonifolius*. Both Beeby's and Scully's plants possess a somewhat cancellate venation which is a quite normal character in the leaves of *P. polygonifolius* from deep peaty water. *P. Seemenii* should be looked for where a tributary stream of such turbid water enters the clearer water of river or lake in which *P. gramineus* flourishes.

W. H. PEARSALL.

737/23. POTAMOGETON PUSILLUS L. An unusual form of this species was collected by Dr Geo. Taylor at Yetholm, Roxburgh, on July 8, 1935. It differs from any British form of this species hitherto described in its long, very gradually tapering and very acute leaves and in the exceptionally strong development of its lacunar system. It bears a superficial resemblance to *P. pusillus* L., var. *lacunatus* (Hagström) Fernald, described and figured in "The Linear-leaved North American Species of Potamogeton" (Memoirs of the Gray Herbarium, III, 85, and Plates, 18, 30 and 35). In that variety, however, the entire space between the midrib and the lateral nerves is usually filled with bands of lacunae. When *P. pusillus* produces longer leaves they tend to taper more gradually to the apex but no British specimens I have seen show this tendency—or the strong bands of lacunae—in so marked a degree as do these plants. The stem is filiform, much compressed, the internodes are long—up to 9 cm.—and the sheaths show only the immature peduncle (5 mm). In the absence of fruit I should refer these plants to *P. pusillus* L., var. *Berchtoldi* (Fieb.) Asch. et Graeb. Syn. Mitteleurop. Fl., 1897, 345 (*P. Berchtoldi* Fieber

Pot. Böhm., 1838, 40-41, pro parte). It is generally agreed that Fieber's *P. Berchtoldi* includes forms of *P. pusillus*, hybrids of that species with *P. Friesii* and—according to some French authors—hybrids of *P. obtusifolius* and *P. trichoides*. However, the *pusillus* forms have been separated under the above varietal name by Ascherson and Graebner and, pending subsequent emendation, should retain it.

W. H. PEARSALL.

737/29. *P. INTERRUPTUS* Kitaibel. It cannot be too often affirmed that this is not a separate species but merely a form of *P. pectinatus* L. Judging by the number of enquiries as to its characters and status it may be well to again set out its essential distinctions. According to the original description in Schultes, *Oesterreichs Flora*, 1814, 328, a plant with rather broad and elongated leaves and conspicuously interrupted spikes was meant—"Die Blumen in entfernt stehenden Querlen"—the whorls of flowers being distant. This character is further implied by the choice of the name *interruptus*—otherwise unintelligible. Ascherson (*Fl. Prov. Brand.*, 1864, 666) seems to have been the first to see that its characters were those of *P. pectinatus* and reduced it to a variety of this species—*P. pectinatus*, b. *interruptus* (Kit.) Ascherson. Since that date the majority of European authorities have retained it as such. In 1851, Babington established his *P. flabellatus*, which is now by common consent considered to be synonymous with *P. interruptus* Kit. In *Hooker and Arnott*, 1855, 479, we read "Mr Babington says of his *P. flabellatus* that the principal difference is in the earlier leaves, but that when in fruit it is very difficult to distinguish it from *P. pectinatus*." This was written 80 years ago, and during that period our knowledge of this genus has enormously increased, especially through the splendid work of the Swedish botanists Dr G. Tiselius and Dr J. O. Hagström. Examination of herbarium specimens of *P. flabellatus*, so labelled by Babington himself, shows conclusively that it is a form of *P. pectinatus*.

Respecting the fruits of this species there is the widest divergence of opinion in the literature. They are stated to be "keeled on the dorsal margin" by Chamisso, E. Fries, Gussone, and others. On the contrary, Grenier, Marsson, Morong, Kihlman, and Vuyck describe them as being "without keel." Hagström, however, states (*Crit. Res.*, 1916, 41) "The cover of the putamen is always rounded without keel, and the flesh also has the same curvature, but in the dried state false keels are often formed, both dorsally and laterally." In any case it is, in my judgment, impossible to separate normal *P. pectinatus* from the f. *interruptus* by the character of the fruits alone. The basal stem-leaves of each are, however, much more reliable for diagnostic purposes; in both cases they are obtuse, but those of *pectinatus* are usually much narrower than those of *interruptus* and also more early deciduous. It is, perhaps, unfortunate that in Fitch and Smith (968) and Fryer (*Pots. Brit. Isles*, Pl. 57) only the upper part of the stem of *P. pectinatus* is figured, all the leaves being apparently alike in form—there is no inset

showing the very different obtuse basal stem leaves. On the other hand the figures of *interruptus* in both Fryer (Pl. 59) and Butcher (393) show separately the broad and obtuse basal leaves. The inference often drawn from these figures is that only *interruptus* possesses these leaves, which, of course, is not the case.

P. pectinatus has been described in my paper, B.E.C. 1930 Rep., 408-410 (1931), and under the var. *diffusus* Hagström is given f. *interruptus* (Kit.) Asch. That is the correct status of this plant, all its essential characters being those of *P. pectinatus*. This species has a world-wide distribution much more extensive than that of any other species of the genus and is extremely variable. The f. *interruptus* is chiefly found in streams with a strong current and its lengthened stem, longer upper internodes and leaves are the results of this. Its broad basal stem-leaves differ only from those of normal British forms of *P. pectinatus* in being wider and more persistent—often remaining green through the winter—whereas those of most other forms are early deciduous and therefore seldom seen. The characters to be looked for in f. *interruptus* are:—1. Distinctly well-interrupted spikes of large fruits. 2. An elongated stem, much branched, with long upper internodes (ca. 5 cm.) and lower longer. 3. Basal stem-leaves very broad and obtuse, upper stem-leaves long but narrower, branch-leaves very narrow. 4. Sheaths rather long.

W. H. PEARSELL.

753/46d. *CAREX ACUTA* L., var. *GRACILESCENS* Almq. This name was introduced to British botanists by Ar. Bennett, who added it to the 8th edition of the *London Catalogue* in 1886 (p. 33, No. 1582d; also ed. 9, 41, No. 1682d; 1895). He attributed the name to Almquist but neither Kükenthal, Salmon (*Journ. Bot.*, 1931, 234) nor I can find that Almquist ever published it. Krok (*Bibliotheca Botanica Suecana*, 1925) gives a list of Almquist's publications dealing with *Carex*, but I cannot find the name in any of these papers. It must therefore be assumed that Almquist merely suggested the name for the British plant submitted to him by Ar. Bennett, as mentioned by Bennett in 1915 (B.E.C. 1914 Rep., 170: "Agrees very closely with the Cambridgeshire specimens so named for me by Dr Almquist"). Evidently Bennett used some Cambridgeshire specimen as a working type, but unfortunately this specimen was not found by me when Herb. Bennett was examined, nor was it in Herb. C. E. Salmon, to which some of Bennett's specimens had been removed.

So far, therefore, the name has been a "nomen nudum," and invalid. Unfortunately it did not remain so, for in 1892 (B.E.C. 1891 Rep., 348) Bennett comments as follows on specimens sent in by A. Ley as *C. aquatilis*, var. *Watsoni*, from near Bala Lake, Merioneth, 10th July 1891:—"Leaves with revolute margins, a few of the female spikes with male flowers, stem triquetrous, upper part rough, fruits unripe, but with indications of veining, which would become more apparent as it ripened; with these characters one can but refer it to *C. acuta* L., var. *gracilescens* Almq." All except the first of these characters are those used to separate *C. acuta* from *C. aquatilis*, and this character of leaves with

revolute margins defines the variety. But again there is no specimen in Herb. Bennett (or Herb. Salmon) and I therefore would ask anyone to whom they may have been loaned to return them to the Herbarium of the British Museum, where they should be found.

Unless Bennett published the name with description before 1892—and I can find no such publication—this description of the Bala plant must count as the first valid publication. This is unfortunate since the type must then be the Bala plant and not the Cambridgeshire plant as intended and used by Bennett. It would probably be better to treat the name as *nomen dubium* until Bennett's specimens have been found, when a decision can be made which will not be liable to reversal.

A. J. WILMOTT.

REVIEWS.

ORCHIS LATIFOLIA L. In a contribution to the *Journal of the Linnean Society*, January 1935, entitled "On Some Marsh Orchids," Mr H. W. Pugsley has challenged the accepted interpretation of *O. latifolia* L. and *O. incarnata* L., and has revised the European plants of this group. Pugsley's thesis is (1) that *O. latifolia* L. is the plant known in recent years as *O. incarnata* L., (2) that there is no evidence that Linnaeus ever saw a living Marsh Orchid with spotted leaves, and (3) that *O. incarnata* L. was described from a pink form of *O. sambucina* L. As to these propositions it may be said that there is ample justification for (1), but that (2) and (3) are not quite so certain. Of course (1) is the point that matters.

Pugsley gives a full and careful account of the pre-Linnean work done on the Palmate Orchids, and then, in complete detail, their descriptions and synonyms in all the publications of Linnaeus including these plants, namely, *Hortus Cliffortianus* (1737), *Species Orchidum* (1740), *Flora Suecica* (1745), *Species Plantarum* (1753), *Flora Suecica* (1755), *Species Plantarum* (1763), with later MS. notes on an interleaved copy, and the *Mantissa* (1771). Of these, the important works are *Sp. Pl.* (1753) and *Fl. Suec.* (1755), in which last *O. incarnata* was first described.

For the purpose of clearness, let us call "X" the orchids which are generally known as *O. incarnata* L., with narrow cucullate leaves, unspotted, very hollow stems, and small flowers with the side-lobes of the lips reflexed, and "Y" the plants usually named *O. latifolia* L., with usually more lanceolate, flatter, spotted leaves, less hollow stems, and larger flowers with flatter lips, side-lobes not reflexed, and a strong pattern of double lines.

In *Sp. Pl.* (1753) the description of *O. latifolia* is, "Orchis bulbis subpalmatis rectis, nectarium cornu conico, labio trilobo lateribus reflexo, bracteis flore longioribus." Here nothing is said about spotted or unspotted leaves, but the reference to the reflexed side-lobes of the lips points to "X." The synonyms can mostly be identified as "X," though Bauhin *Pin.*, 85, is a plant with long spurs, Vaillant, Paris, 8, *O. palmata sambuci odore*, and ϵ *O. palmata palustris maculata*. This is a very indefinite plant, with "apparently clouded leaves, and very small flowers." It is of no evidential value at all.

The specimen of *O. latifolia* in the Linnean herbarium appears to be "X." The leaves are not typical, but the bracts and spurs are right, and it looks as if the side-lobes of the lips might be reflexed. On the whole it is most probable that the *O. latifolia* of *Sp. Pl.* (1753) is "X." Specimen and description point this way. If Linnaeus saw, as he probably did, "Y" plants at Fontainebleau (1738), and at Skåno (1749), they are not allowed for in his description.

In *Fl. Suec.* (1755) to the description of *O. latifolia* is added, with other items, "folia parum maculata." Then *O. incarnata* is described as "bulbis subpalmatis rectis, nectarii cornu conico, labio obscure trilobo serrato, petalis dorsalibus reflexis." Then "very much like the preceding, with these differences, the leaves unspotted, pale green, not dark green and spotted, the stem shorter by half, bracts hardly longer than flower or ovary, corolla pale flesh-coloured, not red, the two dorsal petals quite reflexed, not so spreading, the lip agreeing in structure." This last phrase may mean that the side-lobes of the lips in *O. incarnata* are not so spreading as in *O. latifolia*. The only synonym given is Seguier's *O. palmata lutea*, which is *O. sambucina*, of which species the description follows.

Here the giving to *O. latifolia* of spotted leaves brings in "Y." Pugsley says there is no evidence that Linnaeus ever saw a living Marsh Orchis of the "Y" type. But as we have no reference to plates which might be referred to "Y," it is preferable to suppose that Linnaeus is including a "Y" which he had seen somewhere. In Sweden "Y" appears to be found only in Skåne and Småland. Now the map in Jackson's work on Linnaeus shows that he visited both the districts in question, Småland in May 1741, and Skåne in May-June 1749. Moreover, in June 1738, Linnaeus spent some days about Fontainebleau, where there is plenty of "Y." And as Fries notes that "Y" in Scandinavia is "foliis submaculatis," this may account for the "folia parum maculata" of Linnaeus. On the whole, it may be suggested that Linnaeus, finding no more "Y" anywhere, concluded that it was a mere variant of "X," and dropped it from subsequent descriptions. If so, "Y" makes almost a casual appearance in *Fl. Suec.* (1755), and thereafter disappears. In *Sp. Pl.* (1763) no reference is made to spotted leaves for *O. latifolia*, and the MS. of the interleaved copy says, "folia non maculata," and in the *Mantissa* (1771) we have "foliis immaculatis."

It therefore seems certain that *O. latifolia* of *Sp. Pl.* (1753) is "X," and Pugsley's main thesis is established. This is no doubt a disconcerting conclusion, as all modern floras take *O. latifolia* as "Y." However, botanists ought to be well used to changes of nomenclature. They are part of the game.

What, then, is to be done with *O. incarnata*? Pugsley's contention is that Linnaeus was describing a pink form of *O. sambucina*. This may be so, but it is not certain. *O. incarnata*, in Linnaeus's description, has pale green leaves, a short stem, and short bracts. Now "X" tends to yellowish-green leaves, whilst the leaves of *O. sambucina* are rather dark, and not yellowish. As to the stems and bracts, there are plenty of short plants of "X" and plenty of tall plants of *O. sambucina*. The short forms of "X" often have short bracts, but the bracts of *O. sambucina* are usually very large indeed, larger than those of "X." Moreover, the specimen of *O. incarnata* in the Linnean herbarium is certainly not *O. sambucina*. All this supports the conclusion that Linnaeus in *Fl. Suec.* (1755) transferred "X" to his *O. incarnata*. His emphasising the "red" colour of *O. latifolia* points to "X" for the other species. If in

Sweden "X" usually had purple flowers, and Linnaeus had recently found some flesh-coloured specimens, he might possibly have confused them with the pink *O. sambucina*; but the reverse is the case. In Sweden the purple form of "X" is rare.

In *Fl. Suec.* (1755) the description of *O. sambucina* follows that of *O. incarnata*. The only difference of any account is that the lips of the former are said to be ovate. In both cases the bracts are said to be short, which is not the rule for either of them. In *Sp. Pl.* (1763) *O. sambucina* is put before *O. incarnata*, and an MS. note in the interleaved copy says "forte praecedenti varietas." In the *Mantissa* (1771) again "varietas forte proximae," i.e. *O. sambucina*. So, evidently, Linnaeus did somehow confuse *O. incarnata* and *O. sambucina*.

We conclude that, as there is nothing in Linnaeus's description to distinguish these two species, and as Linnaeus came to regard *O. incarnata* as merely a variety of *O. sambucina*, the name *O. incarnata* is quite otiose, and must be discarded. Alternatively, if Linnaeus in *Fl. Suec.* (1755) was describing a form of "X" as *O. incarnata*, he was really duplicating his *O. latifolia* of *Sp. Pl.* (1753), and again the name is otiose. So as *O. latifolia* is "X" we need a new name for "Y." This seems quite necessary on the literary evidence; but what actually Linnaeus himself regarded as *O. incarnata* remains to the present writer a complete mystery.

For the help of those who cannot see the original paper, it will be useful to give the complete scheme of revised forms from Pugsley's paper, omitting *O. sambucina*.

- a. *Latifoliae verae*. 1, *O. latifolia* L. 2, *O. cruenta* Mull.
- b. *Sesquipedales*. 3, *O. praetermissa* Druce. 4, *O. pardalina* Pugsley.
- c. *Majales*. 5, *O. purpurella* Steph. 6, *O. majalis* Reich. 7, *O. alpestris* Pugsley.

On these some notes may be appended.

1. *O. latifolia*. This is the species named *O. incarnata* in all modern floras.

2. *O. cruenta*. This species is Northern (Scandinavia, Russia, Siberia). It has been claimed for Britain; but the British plants are *O. purpurella*. Pugsley reports the species also from the Alps.

4. *O. pardalina*. This is the species generally known as *O. latifolia*. In *Nederlandsch Kruidkundig Archief.*, 1933, Vermeulen discussed this form, especially in relation to *O. praetermissa*. He named it *O. latifolia*, var. *junialis*, making Reichenbach's *majalis* also a var. of *O. latifolia*, here following Kittel. He showed that the var. of *junialis* is identical with British "Y" plants. In *Journ. Bot.*, April 1934, these conclusions were given, with some good plates. It is to be regretted that Pugsley did not adopt Vermeulen's name *junialis*. It suits well with Reichenbach's name *majalis*; and it is a pity to have two new names for identically the same set of plants.

5. *O. purpurella*. Pugsley is inclined to think that this runs into *majalis*; but Vermeulen's figures in *Journ. Bot.* show how very different

is the structure of the leaves. *O. majalis* has broad leaves with usually very heavy crimson blotches all over the leaves. *O. purpurella* has smaller, less pointed leaves, usually narrower, with a very few tiny sepia dots, chiefly at the tips of the leaves. In a very few cases, the leaves have numerous spots, but these are quite unlike the *majalis* spots (being perfect circles, oblongs, etc.). Also the flower-colour and markings are quite different. and the diamond-shaped lip of typical *O. purpurella* is quite distinctive.

7. *O. alpestris* Pugsley. This is a new species, to include the very beautiful forms of the Alps of Central Europe. A careful study of these plants might very well result in the separation of some good varieties.

Turning to varieties, we have *O. latifolia*, β *Gemmana* Pugsley. This includes the very tall plants, with long leaves and large bracts.

γ . *ochroleuca* (Boll). Flowers large and lemon or straw-coloured, a very handsome variety. This has been found by Mr J. E. Lousley, in plenty, in fens on the borders of Norfolk and Suffolk.

δ . *pulchella* (Druce). A form with bright purple flowers and very heavy lip-markings.

ϵ . *coccinea* Pugsley. This is the beautiful form with maroon-coloured flowers. It was named by Godfery forma *atrirubra*; but as he omitted a Latin description, Pugsley has renamed it.

In *B.E.C. Rep.*, 1915, Druce described a var. *dunensis* (of *O. incarnata*), giving Sands of Barry and Freshfield as localities. In *B.E.C. Rep.*, 1917, he gave as colours, white, rose, crimson to dark purple. This var. is evidently a rather dwarf soil-form of sand-dunes, whereas var. *coccinea* is a colour-variety, pure and simple, and may be dwarf or tall.

ζ . *cambrica* Pugsley. It is very doubtful whether this is anything but a colour-variety. Apart from sand-dunes, the purple-flowered form is found in many districts, and is frequent in East Anglia. In structure it does not appear to be different from the flesh-coloured forms in inland districts.

O. pardalina. There are three stations in S. Devon, two near King's Kerswell and one near Axmouth, where there are fine colonies of this species, no form of *O. maculata* being on the ground. Near Borth there is a very interesting colony of plants which will probably take rank as a new variety, growing where there are *O. elodes* and *O. purpurella*, as well as "X," but no *O. praetermissa*. Mr P. M. Hall saw these plants in 1935, and thinks they may be derived from "X" and *O. purpurella*, but with no influence of *O. elodes*.

O. purpurella, β *pulchella* (Druce). This form naturally falls here. It is really a form of *O. purpurella*, and not at all like *O. praetermissa*. It is almost always found growing with *O. purpurella*, or at any rate in the same geographical area. Godfery, from what he says in his Monograph, evidently agrees with this.

O. majalis, γ *occidentalis* Pugsley. This is a fine form occurring in Ireland.

Pugsley is inclined to put Godfery's "Mystery Orchis" (*O. latifolia*, var. *eborensis*) under *O. majalis*. The chief difficulty here is the time of flowering. It should probably be placed under *O. pardalina*.

T. STEPHENSON.

The writer of this review is much indebted to Mr P. M. Hall for criticisms and suggestions.

ABSTRACTS FROM LITERATURE.

A. J. WILMOTT, assisted by Miss M. S. CAMPBELL, P. M. HALL,
J. S. L. GILMOUR, and others.

Owing to the fact that two years' Abstracts are included in this number, it has been necessary to condense as much as possible. There is a considerable literature which has not been looked through, and the compiler would be glad to hear from anyone willing to undertake the abstracting of some of the periodicals. The Bibliography will be found at the end of the Abstracts.

GENERAL.

(A) MORPHOLOGY.

INFLORESCENCE.—The Angiosperm inflorescence types are studied phylogenetically by Zimmermann (1935 A), who regards the cymose panicle as primitive and (p. 99) gives a diagrammatic figure which illustrates the relations between this and other types of inflorescence. The origin of the "flower" is also discussed.

SEEDS.—Fruits and seeds of 306 species of weeds [nearly all British] are described and finely illustrated by Karsmo (1935).

STOMATA.—The orientation of the stomata of many British species is described by Smith, G. E. (1935), who shows it to be related to the course of the underlying vascular system.

(B) ANATOMY.

For a comparative study of the endodermal anatomy of many British species of phanerogams see Rajkowski (1934).

(C) CYTOLOGY.

A table of the chromosome numbers of the angiosperms of Slesvig Holstein (Tischler, 1935: 4-24) includes a very large proportion of the species of the British Flora.

(D) ECOLOGY.

ARCTIC VEGETATION.—A discussion of the factors responsible for the instability in arctic vegetation, which is in such strong contrast with the relatively stable plant formations of the temperate zone: Griggs, Robert F. (1934).

BEECHWOOD (Chiltern Hills).—See Watt (1934).

EPIPHYTES.—A list of trees, and plants that have been found growing epiphytically on them, is given by Magocsy-Dietz (1935), many British species being mentioned.

FEN DEPOSITS.—The controlling factors in the deposits of fen peat (studied near Ely) are discussed by Godwin and Clifford (1935).

GRASSLAND.—Retgression of permanent pastures in Devonshire is described by Fenton (1934).

Statistical methods of investigating the distribution of species in grasslands are described by Blackman, G. E. (1935).

Ungrazed grassland on limestone is described by McLean (1935).

Transitions from woodland and moorland to grassland have been studied in the Spey Valley (and elsewhere) by Fenton (1935).

MOUNTAIN PLANTS.—Dusseau (1934) shows that the leaves of many high alpine cushion plants (*Silene acaulis*, etc.) become mummified (without complete decomposition) and form a protection against rigorous climate.

RUDERAL PLANTS.—The vegetation of footpaths, sidewalks, cart-tracks, and gateways is studied by Bates (1935).

SOIL: CALCIUM CONTENT.—The behaviour and chemical composition of various plants in relation to the calcium content of the soil is studied by Popovici (1934).

HYDROGEN-ION CONCENTRATION.—Some relations to plant distribution are discussed by Emmett & Ashby (1934).

TRANSPLANT EXPERIMENTS.—Third report on these experiments. See Marsden-Jones & Turrill (1935 B).

(E) PHYTOGEOGRAPHY.

FLORISTIC ELEMENTS.

Steffen (1935) discusses some of the floristic elements of the European flora, giving lists of the more outstanding species of each group. [Names sometimes condensed by A.J.W.]

1. ARCTIC ALPINE.
2. SUBARCTIC AND SUBARCTIC OREOPHILE.
3. PONTIC.
 - i. *Species of Steppes* and similar formations distributed over several floral regions. In addition to such species as *Silene Otites*, *Artemisia campestris*, etc., numerous common British species belong to this group, e.g., *Achillea Millefolium*, *Carex praecox*, *Galium boreale*, etc., etc.
 - ii. *Pontic-siberian*. The only "British species" in this group is *Linum perenne* L. [But our British plant is not the Siberian plant.—A.J.W.]
 - iii. *Pontic-mediterranean*—including *Hutchinsia petraea*, *Symphytum tuberosum*, *Trifolium ochroleucum*, and a second list of species more widely spread into Transcaucasia (or even occurring in Central Asia), including *Alsine tenuifolia*, *Aster Linosyris*, *Bupleurum tenuissimum*, etc.
 - iv. *Mediterraneo-siberian*, including *Carex humilis*; some stray into Central Asia and have their main asiatic area there, *Milium vernale* (*scabrum*) and *Verbascum Blattaria*.

- va. *Aralo-caspian* (none British); and vb, also widespread into Siberia, or in Persia or Transcaucasia, including *Orobancha coerulea*.
- via. *Pontic-caucasian* and vib *Pontic-transcaucasian*; vii. *Eu-pontic*; viii. *Pannonian*; ix. *Russo-pannonian* (Steppe); x. *Eury-pontic*, and xi. *Dacic and mösic*: none (of vi-xi) British.

4. ATLANTIC.

- 1a. *Eu-atlantic*, with compact distribution in Atlantic Europe (sensu Braun-Blanquet), and as appendices a *macaronesian* (Atlantic Is.) list, including *Asplenium marinum* and *Barbarea praecox*, which is probably a separate floristic-element, and a second list of species which more or less lead into the mediterranean element (including *Beta maritima*, *Ceterach officinarum*, *Crithmum maritimum*, *Cynosurus echinatus*, *Daphne Laureola*, *Brassica adpressa*, *Lagurus ovatus*, *Ophioglossum lusitanicum*, and *Umbilicus pendulinus*).
- 1b. *Sub-atlantic*, which stray into neighbouring regions.
1. *Atlantic-submediterranean*, including *Arabis scabra*, *Armeria plantaginea*, *Oenanthe crocata*, and many other British species.
 2. *Atlantic-subarctic*, which reach some part of the sub-arctic region—*Armeria maritima*, *Atriplex glabriuscula*, *Cochlearia anglica* and *C. danica*, *Erica Tetralix*, *Hieracium Peleterianum*, *Isoetes echinospora*, *Saxifraga decipiens* and *S. hypnoides*, *Sorbus scandica* and *Utricularia ochroleuca*, and a few which also occur in high mountains of Southern Europe are perhaps best placed here (incl. *Arenaria gothica*).
 3. *Atlantic-suboceanic*, including those species with distribution wider than Atlantic in various directions (found in areas with sub-oceanic climate), for which the climate of the "Litorina-period" may be responsible. This includes many British species—*Aira praecox*, *Alisma natans*, *Centaurea nigra* and *C. pratensis*, *Dianthus caesius*, *Galium saxatile*, etc., etc.
- c. *Atlantic-mediterranean*, equally at home climatically in both regions—including *Arbutus Unedo*, *Luzula Forsteri*, *Ophrys apifera*, etc., etc.
- d. *Atlantic-american* (really the true Atlantic, i.e., on both sides of the ocean)—*Carex arenaria*, *Drosera intermedia*, *Eriocaulon septangulare*, *Lobelia Dortmanna*, *Lycopodium inundatum*, *Myosotis palustris*, *Scirpus americanus*, *Sisyrinchium angustifolium*, *Spartina alterniflora* and *S. stricta*, *Spiranthes Romanzoffiana* and *Statice Limonium*.

Many British species (and European floristic elements) are mentioned also by Suza (1935) in discussing the xerotherm areas and steppe types of S.W. Moravia (with distribution maps).

Very many British species are dealt with by Lange (1935) in grouping the species of the Jemtland flora according to their distribution in that area (with many maps).

ORIGIN OF THE BRITISH FLORA.

A whole day discussion of this problem took place at the Royal Society, the morning devoted to papers and the afternoon to discussion (PRS.Lond., Ser. B, 118, 197-241). The Tertiary floras, with decreasing Chinese element as climate cooled until immediately before the glacial period when the flora was essentially the same as now, were discussed by Mrs Reid. The climate and geography of the Ice Age were discussed by Prof. Boswell, whose tentative maps of the ice of various periods left ice-free areas far greater than the usual maps summing all glaciations, which "do not furnish a true picture of events." Miss Chandler argued for complete extinction, citing southern records of boreal plants such as *Betula nana* in S. Devon [but ignoring the Atlantic *Salix atrocinerea* shown in the same slab of rock!]. Dr Godwin discussed the post-glacial floras as reconstructed from pollen-analyses of peat, but these do not give indication of conditions *during* glaciation. Wilmott (1935 A), on grounds of taxonomy and distribution, considered that much of the flora survived glaciation in the British Isles and that the climate was not as severe as generally considered. Salisbury (1935) assumed "age-long 'winters' of the glacial epochs" and the certain extinction of southern and oceanic types. Du Rietz gave abundant evidence that the Scandinavian flora was not extinguished in glacial times—"it seems . . . certain that a very great part of [the Scandinavian] flora survived at least the last glaciation on ice-free coast areas in Norway . . ."

STUDIES OF PEAT.

SNOWDONIA.—Woodhead and Hodgson (1935): dating only possible by comparison with other peats and results indefinite.

ADVENTIVES.

A short account of alien plants noticed in Havelland, Brandenburg, is included in a general history of the flora by Mrugowsky (1935).

(F) TOPOGRAPHICAL.

BRITISH ISLES.—A pocket book for the ready identification of 844 species of British plants, illustrated by Miss Trower and Miss Weston, has been produced by Skene (1935).

The changes in the flora during the last 50 years are discussed by Wilmott (1935 B).

Don, George: *Herbarium Britannicum*.—Notes on this series of exsiccata, with details of labels not available to Dr Druce in his account of an incomplete set, are given by Evans (1934).

English Names.—Second volume of the late Canon Fisher's work noticed in Vol. x, 807.

Wild Flower Preservation.—A considerable correspondence on this subject from the most diverse points of view is to be found in Gard. Chron., 96, see Index, p. vii (1934).

S. DEVON.—A list of plants seen in the neighbourhood of Salcombe is given in Pugsley (1935 B).

N. DEVON.—The aboriginal flora of Lundy has an Oceanic facies, which would mean that since its final appearance above the sea and becoming capable of supporting vegetation Lundy has not been directly joined to the mainland. This theory is supported by the absence of trees except for quite recent introductions and by the absence of all reptiles and many mammals. The presence of Neolithic artefacts argues the greater proximity of the mainland towards the close of the Glacial Epoch but not necessarily complete connection with it. Most of the native species were probably brought by birds, of which there is a large resident population, and also Lundy lies in the main stream of migration.—Elliston Wright (1935 A).

N. SOMERSET.—The effects of drought on the vegetation of reservoirs were studied in the autumn of 1933 and dry season of 1934. At Blagdon many young plants of *Stellaria aquatica* had the leaves blotched with dark purple, thought by Kew to be due to the presence of anthocyanin pigment. At Chew Magna *Polygonum amphibium* had its stems surrounded by pale brown corky masses due to a Polyzoon, *Plumatella fungosa*. A great amount of *Barbarea vulgaris* flowered at Chew Magna in 1934 although scarcely seen there in 1933.—Thompson (1935).

DORSET.—Ecology. South Haven peninsula (Studland Heath). The general ecology of the flowering plants and ferns is described by Good (1935).

LONDON AREA.—Botanical Records of the London area, 1934: Part 6.—London Naturalist Reprints, No. 15.

CHILTERN HILLS.—The vegetation, with special reference to the beechwoods and their seral relationships, is studied by Watt (1934).

YORKSHIRE.—The vegetation of Redcliff Sand (Humber) is described by Good & Waugh (1934).

WALES.—Catalogue of the Welsh flora with much additional information by Hyde & Wade (1934). See Vol. x, p. 805.

CARDIGAN.—Flora of the county by Salter (1934). See B.E.C. Rep., Vol. x, p. 805.

DOVEY ESTUARY: Salt Marshes.—The rates of vertical accretion, horizontal extension, and scarp erosion are detailed and discussed by Richards (1934).

MORAY.—Flora of the county by Burgess (1935). See B.E.C. Rep., Vol. x, p. 807.

IRELAND.—An excellent tourist's guide to the whole country has been produced by Praeger (1934) on the lines of his earlier flora of the west

of Ireland. Recent discoveries have shown that many interesting and critical members of the Irish Flora have a wider range of distribution than was previously known. This result is almost entirely due to the work of Praeger (1935).

DOWN: MOURNE MOUNTAINS.—Vegetation maps by Armstrong, Ingold & Vear (1934).

(G) SYSTEMATICS.

RANUNCULACEAE. Floral anatomy detailed (many fine plates) by Brouland (1935): *Aquilegia vulgaris* (p. 17), *Helleborus foetidus* (p. 44), *Eranthis hyemalis* (p. 49), *Delphinium Ajacis* (p. 55), *Trollius europaeus* (p. 74), *Caltha palustris* (p. 82), *Actaea spicata* (p. 90), *Anemone nemorosa* (p. 112), *A. Pulsatilla* (p. 122), *Clematis Vitalba* (p. 131), *Thalictrum minus* (pp. 150, 149), *T. majus* and *T. alpinum* (p. 148), *Myosurus minimus* (p. 152), *Ranunculus repens* (p. 174), *R. acris* and *R. sceleratus* (p. 184), *Ficaria* (p. 200). As a result of the study changes in classification are suggested (p. 243), notably placing *Actaea* in *Helleboreae*; *Ficaria* would be reunited to *Ranunculus*.

- 3/1. ANEMONE PULSATILLA L. A great amount of information (genetics, phylogeny, ontogeny, anomalies, etc.) concerning this species is given by Zimmermann (1935 B) in a paper dealing with *Pulsatilla vulgaris* and some of its many subspecies.
6. RANUNCULUS L. Petals: the structure of the starch layer in the glossy petals of the British species is described by Parkin (1935).
- 6/33. R. FICARIA L. occurs in two forms, one with bulbils in the axils of the leaves, the other without. The bulbil-producing plant is tetraploid ($2n = 32$) and is described as a new var. [33e] **bulbifera**: distribution unknown, less common than the typical species and usually, but not always, found in shady places. In this form reproduction is almost entirely vegetative and the number of viable seeds produced is very small. Tables of counts of viable and abortive seeds and lists of visiting insects (48 species were seen in 35 observations) are given.—Marsden-Jones (1935 B). The flower variation is described by Alkins (1934).
- 7/2. CALTHA RADICANS Forst. has long been known from a single station on L. Erne but is now found to be spread all over Ireland, having been recorded from 36 v.-cs. It is not a montane species and is particularly abundant on lake-shores in the Central Plain. In addition to a tendency to hybridise with *C. palustris*, *C. radicans* is very variable: the most persistent characters are the single-crowned, unbranched rootstock and very short lowest internode.—Praeger (1935).
21. PAPAVER L. Four species are critically discussed, and a key to the species and varieties given by Mosseray (1934).

22. *MECONOPSIS* Vig. Monograph of the genus by Taylor (1934). *Mecconopsis cambrica* (L.) Vig. is the only species of the section *Cambricae* (p. 20) which is confined to western Europe; all the remaining species are exclusively Asiatic. The pre-Linnean synonymy is given in full: no varieties are recognised.
- 35/1. *NASTURTIUM OFFICINALE* R. Br. (*Radicula Nasturtium* Dr.). Cytology: three forms in Britain as on the Continent:—diploid $2n = 32$, triploid $2n = 48$, tetraploid $2n = 64$. The diploid has widest range and except in the British Isles is the commonest. The tetraploid occurs only in the north, where it is as abundant as the triploid. Cultivated strains are all diploids originating at Erfurt, except the brown "winter" variety, which is triploid.—Manton (1935).
- 37/5. *ARABIS PETRAEA* Lam. Map of distribution in Moravia by Suza (1935: 480).
- 42/4. *ALYSSUM CAMPESTRE* L. This is a *nomen confusum*, according to Turrill (1935 B). The earliest available name traced is *A. parviflorum* Fischer, ex M. Bieb. Fl. Taur. Cauc., 3, 434 (1819).
44. *EROPHILA* DC. Cytological and experimental investigations by Griesinger (1935). Of the four (Munich) strains cultivated some had chromosomes $n = 12$, others $n = 20$. Emasculated flowers produce no seed. Crosses between strains with the same number of chromosomes produced fully fertile F_1 with normal pollen; $n12 \times n20$ gave much bad pollen and almost complete sterility; back crossing gave results only when the F_1 was used as pollen-parent.
- 45/5. *COCHLEARIA ANGLICA* L. has been considered a southern plant in Ireland but is now known all round the coast, hybridising everywhere with *C. officinalis*. Var. *Hortii* Syme is considered a hybrid form.—Praeger (1935). [The true var. *Hortii* is the peculiar Merseyside uniform plant.—A.J.W.]
- 45/6. *C. GROENLANDICA* L.? (*C. scotica* Dr.) occurs from Cork round the west coast to Antrim, crossing occasionally with *C. officinalis*.—Praeger (1935).
- 47/2. *HESPERIS MATRONALIS* L. Aljawdina (1935) describes the thickenings in the seed coat which act as lenses concentrating the rays of light, without which the seed will not germinate; the seed is negative to diffuse white light but positive to ultraviolet rays.
49. *SISYMBRIUM* L. Chromosomes—*S. officinale*, $n = 7 + 2$ microchromosomes + 2-3 satellites, and $2n = 14 + 4$ mc. + 4-6 satellites; *S. Irio*, $n = 9$ (8 large and 1 small), $2n = 18$ (16 large and 2 small); *S. Sophia*, $n = 10 + 1$ satellite, $2n = 20 + 2$ satellites; *S. Columnae*, $n = 7 + 2$ microchromosomes and $2n = 14 + 4$ mc.; *S. Alliaria*, $n = 18$, $2n = 36$.—Mayor (1934).
- 52/1. *CAMELINA SATIVA* Crantz. Chromosomes, $n = 14$, $2n = 28$.—Mayor (1934: 87).

54. **BRASSICA L.** The chromosomal relationships of the Swede and Turnip groups are detailed by Catcheside (1934): Swedes, $2n = 36$; Turnips, $2n = 20$ (N.B., Cabbage, $2n = 18$). The chromosomes are described in detail.

Cytological studies of various hybrids between *B. oleracea* ($n = 9$), *B. campestris* ($n = 10$), *B. napus* ($n = 19$), *B. nigra* ($n = 8$), and *B. juncea* ($n = 18$) are detailed by Nagaharu (1935). There is varying degree of incompatibility, and *B. campestris* \times *oleracea* is very suggestive of *B. napus*, especially in one individual, and from this cross a tetraploid has been found among the cultures.

B. adpressa Boiss. Chromosomes, $n = 7 + 2$ satellites or $8 + 2$ satellites; $2n = 15 + 4$ satellites, but another plant (showing some sterility) had $n = 9 + 3-4$ sat., $2n = 18 + 6-8$ sat.—Mayor (1934: 83).

55. **DIPLOTAXIS DC.** Chromosomes—*D. tenuifolia* (p. 72), $n = 10 + 1$ microchr., $2n = 20 + 2$ mc.; *D. muralis* (p. 81), $n = 9 + 1$ mc. + 4-5 satellites, and $2n$ double this.—Mayor (1934: other Spanish species detailed).

59. **CAPSILLA Medik.** *Capsella Bursa pastoris* and *C. rubella* are critically dealt with by Mosseray (1935 B).

- 66/1. **TEESDALIA NUDICAULIS (L.) R. Br.** Originally in the U.S.A. a ballast alien about Philadelphia, this species is becoming established in four eastern states: details of records given by Blake (1934).

- 76/3. **RAPISTRUM RUGOSUM (L.) All.** Chromosomes, $n = 18 + 1$ microchromosome, $2n = 16 + 2$ mc.—Mayor (1934: 86).

87. **HELIANTHEMUM Mill.** Three species and one hybrid are dealt with critically by Mosseray (1935 A).

- 87/2. **H. CHAMAECISTUS Mill.** has been refound in Donegal and is undoubtedly native, not an introduction as suggested by the only previous finder, H. C. Hart, in 1893.—Praeger (1935).

92. **DIANTHUS L.** Rohweder (1934) gives much interesting information concerning variation, phylogeny, etc., in a long paper on this genus. Chromosomes given as:—*D. Armeria* (p. 256), $n = 15$; *D. deltoides* (p. 270), $n = 15$; *D. Caryophyllus* (p. 289), $n = 45$; *D. superbus* (p. 298), $n = 15$, but *D. plumarius* (p. 312), $n = 45$; *D. gallicus* (p. 307), $n = 30$; *D. gratianopolitanus* (p. 310), "form typicus," $n = 45$, but another Swiss form (as "*D. caesius* Herms," p. 309, and plate 1), $n = 30$.

The following hybrids between British species are dealt with:—(" *D. caesius* Herms " \times *D. plumarius*, p. 317, $2n = 75$, n not found higher than 38); *D. gratianopolitanus* \times *plumarius* (p. 318). Three "mutations" of *D. plumarius* were investigated and a large amount of cytological detail given in tabular form (p. 334) for each species.

- 92/1. D. CAESIUS Sm. Map of distribution in Moravia by Suza (1935: 480).
- 96/1. *SILENE MARITIMA* With. Additional studies of genetics of colour, etc.—Marsden-Jones and Turrill (1935 A). Anatomical differences from *S. Cucubalus* are detailed by Millner (1934: 94).
- 96/2. *S. CUCUBALUS* Wibel. (" *vulgaris* Moench "). Genetics of colour, indumentum, and vegetative parts.—Marsden-Jones and Turrill (1934). Anatomy compared with *S. maritima* (q.v.).
101. *STELLARIA* L. Chromosome numbers given by Peterson (1935) include:—*S. nemorum*, $2n = 26$; *S. media*, $2n = 36-42$ (Heitz, 1926), $n = c. 20$ (Rocén, 1927), $2n = 44$ (Peterson, 1933); *S. neglecta* ($2n = 22$, Peterson, 1933) but a " v. *grandiflora* (Ten.) Bég., $2n = 44$; *S. apetala* Ueria and *S. pallida* Piré, $2n = 22$; *S. halostea*, $2n = 26$ (but $n = 10$, Rocén, 1927); *S. graminea* L. ($n = 13-14$, $2n = 26-28$, Heitz, 1926), ♂ and ♀, $2n = 26$; *S. palustris* Ehrh., $2n = ">100?"$; *S. uliginosa* Murr., $2n = 24$ (24-26, Heitz, 1926).
- 101/3. *S. MEDIA* Vill. The effect of varying light intensity, root medium, dampness of air, temperature, amounts of nitrogen, phosphorus and calcium, pH., and follicle-hormone (" progynon ") upon the flower formation, are detailed by Hitzer (1935). The species does not behave like most others so far studied, in which by changing the conditions vegetative growth and flowering can be increased or depressed. *Stellaria media*, after forming a somewhat variable (4-12) number of pairs of leaves, passes into flowering whatever conditions it was given.
- 102/2. *ARENARIA CILIATA* L. The treatment of the Ben Bulben plant as a distinct subspecies (*hibernica* Ostenf. & Dahl.) is confirmed by Nordhagen (1935: 30), who places *A. norvegica* also under this species as subsp. *norvegica* (Gunn.) Fries. Four other subspecies are also recognised, and the allied *A. cylindrocarpa* Fernald is shown to be *A. humifusa* Wahlenberg.
- 102/7. *A. PEPLOIDES* L. (*Halianthus peploides* (L.) Fr.). Wide distribution in the Arctic detailed by Tolmatchew (1934), but with broken distribution elsewhere.
103. *SAGINA* L. The extreme variability in this genus is caused by the influence of various factors. For example, *S. nodosa* Fenzl is normally glabrous but var. *glandulosa* Bess. occurs less often and both forms grow intermixed. There is also variation in the number of stamens, styles, petals, and sepals. Wet conditions induce lengthening, light intensity induces shortening of the internodes. Var. *moniliformis* Lange is a prostrate xerophytic form, shy flowering but with specialised development for vegetative reproduction. An account of all the species of *Sagina* noticed in N. Devon and the variations, illustrated by photos, is also given.—Elliston Wright (1935 B).

- 111/1. ELATINE HYDROPIPER L. has spread from its aboriginal localities (L. Neagh and two lakes in Co. Down) along canals made 100 years ago, east to Belfast and south to Newry: near the latter the plant occurs in a canal for 15 miles.—Praeger (1935).
- 111/2. E. HEXANDRA L. A note on its forms by Goffart, Maréchal, et Sternon (1935).
112. HYPERICUM L. Noack (1934) continues his studies of *Hypericum* crosses with an account of hybrids between *H. acutum* (i.e., *H. tetrapterum*), *H. montanum*, *H. quadrangulum*, *H. hirsutum* and *H. pulchrum*, between which crosses in all possible combinations were attempted. Reciprocal crosses, *ac.* × *mont.*, *mont.* × *quad.*, *hirs.* × *pul.*, show differences in seedling stage; *ac.* × *mont.* only slight fertility in ♀—back crossing shows strong splitting; *hirs.* × *pul.* quite sterile; *ac.* × *quad.* ± fertile. Ability to cross and fertility of the hybrid varies as the affinity.
- Similar studies are detailed by Herbst (1935). The following crosses are described:—*H. acutum* ♀ with *montanum*, *perforatum*, and *quadrangulum*; *H. hirsutum* ♀ with *acutum*, *montanum* and *quadrangulum* (these never complete result, apparent setting being followed by no viable seed, the embryo rotting); *H. montanum* ♀ with *acutum* (good), *perforatum* and *quadrangulum*; *H. quadrangulum* ♀ with *acutum*, *hirsutum*, *montanum* and *perforatum*. *H. acutum* × *hirsutum* and *montanum* × *hirsutum* did not set. Hybrids with *H. acutum* ♀ are often ± pale green (*acutum*-bleaching); various hybrids are green and white variegated.
125. LINUM L. Many British species and varieties are included in notes on the Bulgarian Flora by Stojanoff, etc. (1934), a new form (f. *micrantha*) of *Linum angustifolium* being described.
- 125/4. L. USITATISSIMUM L. Linseed production in the United States is described by Dillman (1935; in U.S. Department of Agriculture Farmers' Bulletin, No. 1747).
- 147/2. GENISTA PILOSA L. Map of distribution in Moravia by Suza (1935: 481).
- 150/1. CYTISUS SCOPARIUS (L.) Link. The natural distribution in Virginia is considered in relation to its soil reaction. Its acid preference is less pronounced than has been stated by Professor E. T. Wherry. Broom is becoming established in Canada and the U.S.A. slowly, and only along or near the coast line.—Turner, T. W. (1935).
153. MEDICAGO L. The history and world distribution of the various cultivated forms of lucerne and its hybrids with *M. falcata* are described in detail, with maps, by Klinkowshi (1933). *M. sativa* is considered native from Persia and Iraq in the south to just N. of the Caspian Sea in the north, and from Turkey eastwards to the borders of Tibet.

- 154/2. *MELILOTUS ALBA* Desf. The relative growth rates and interdependence of tops and roots of the "biennial white Sweet Clover" are discussed by Martin (1934).
- 155/16. *TRIFOLIUM REPENS* L. The relation of leaf size to root structure is studied by Bates (1934). This species is very sensitive to drought when on light soils: for a study of the effect of conditions on it see Nilsson-Leissner (1935).
- 166/2. *ASTRAGALUS ALPINUS* L. In Arctic America the leaves are sometimes greyish but the canescence is insufficient to warrant a varietal name. The hairiness of the pods is variable, usually black-hairy, sometimes brownish and even whitish.—Malte (1934: 179). [Field observations on these points in this country are desirable.] Distribution: map of occurrence in North America by Rousseau (1933: 23).
170. *CORONILLA* L. Monograph by Uhrova, A. (1935). A large number of subspecies, varieties and forms of *C. varia* L. are described.
- 178/26. *LATHYRUS NIGER* Bernh. The mechanism involved in the swelling and shrinking movements of the pods of this (in Britain rare or extinct) plant is the subject of a detailed investigation by Glage (1934).
185. *RUBUS* L. Several British plants bearing names published by Genevier have been compared with types in Herb. Genevier by Barton and Riddelsdell (1933), with the result that *R. cariensis*, *anglicanus*, *sertiflorus*, *mutabilis*, *nemorosus*, *nutans*, *plinthostylus* and *horridicaulis* disappear from the British list. *R. gymnostachys* Genevier is a legitimate name based on type specimens now in Herb. Mus. Brit., but the species does not occur in Britain.—Barton and Riddelsdell (1935 A).
- 185/1. *R. IDAEUS* L., f. *INERMIS* Lej. & Court. Hruby, J. (1934 A: 381) places under this specimens from "Misk Hills nr. Hucknall, Notts (leg. R. Bulley, distrib. 1928," as var. *obtusifolius* Willd.): the form is recorded for Hungary, Spain, and N. Italy.
- 185/8. *R. OPACUS* Focke. Arbrook Common, Surrey (leg. Catcheside, 14/8/1926, as *R. integrifolius* Müller ?, Wats. E.C.).—Hruby, J. (1934 A: 382).
- 185/11. *R. ALTIARCUATUS* Bart. & Ridd. (1933: 198)—*R. cariensis* Rogers Handb., non Rip. & Genev.
- 185/12. *R. confertiflorus* Watson. This species has previously been known as *R. holerythros* Focke, but that species is not British. Recorded from v.-cs. 16 and 17, it has an affinity with *R. gratus* and a hybrid with *R. Marshalli* has been found.—Watson (1935 A).
- 185/18. *R. LINDLEIANUS* Lees. By stream, Polperro, E. Cornwall (leg. Rilstone, 7/1928, no. 488: BEC., 1928 distr.).—Hruby, J. (1934 A: 386).

- 185/19. *R. ARGENTEUS* W. & N., var. *ARGENTEUS* (W. & N.) Sudre, f. *GENUINUS* Sudre. Fox Down, Cissbury, v.-c. 13 (leg. Riddelsdell, 7/1926, BEC., 1925 distr.).—Hruby, J. (1934 A: 386).
- 185/19c. — — var. *gneissogenes* Sudre. Durdham Down, Bristol, W. Glos. (leg. White, 7/1927. "Pan. grown abnormal," Wats. E.C.).—Hruby, J. (1934 A: 386).
- 185/19d. — — var. *separinus* Genev. Headley Heath, Surrey, v.-c. 17 (leg. E. C. Wallace, 8/1928: ref. 2; Wats. E.C.).—Hruby, J. (1934 A: 387).
- 185/27. *R. BAKERI* F. A. Lees. This name is rejected as a *nomen confusum* on the grounds that the gathering on which Lees' description was based was a mixture; its place is taken by
- 185/27. *R. pistoris* Bart. & Ridd., recorded from v.-cs. 38, 39, 41, 58, 62, 63, 98;
- 185/27(2). *R. Bakeranus* Bart. & Ridd., of the London Commons, v.-cs. 16 and 17, with a var. b. *milcombensis* Bart. & Ridd., in v.-c. 23; and
- 185/27(3). *R. fumarius* Bart. & Ridd., recorded from v.-cs. 64, 65, and 69b: = *R. Bakeri* F. A. Lees, f. *elongata* Rogers: closely related to *R. Lindebergii* P.J.M.—Barton and Riddelsdell (1935 B).
- 185/45d. *R. GODRONI* Lec. & Lam., var. *ellipticifolius* Sudre, f. *MACROBELOPHOROIDES* Hruby. Sibford Heath, v.-c. 23 (leg. Riddelsdell, 8/1927, B.E.C. [1928: as *R. Godroni*]. "Pet. broad, short pale, sep. refl."—forms the transition from var. *ellipticifolius* Sudre (term. lfts. ovate-rhombic, base cuneate-narrowed not rounded, with long "abgesetzter" point) to var. *propinquus* P. J. Müll. (infl. very thick, short, large flowered, thickly spreading hairy)—like f. *macrobellophorus* Sudre, has numerous long, strong prickles, broadly compressed at base, on the inflorescence and flowering branches.—Hruby, J. (1935: 172).
- 185/47c.—*R. ULMIFOLIUS* Schott, var. *anisodon* Sudre, f. *GENUINUS* Sudre. Arbrook Common, Surrey (leg. Catcheside, 8/1926, as *R. thyrsoides* Wimm., Wats. E.C.). Passes into var. *angustifolius*.—Hruby, J. (1934 A: 387).
- — f. *LONGIPETIOLULATUS* (Müll. & Timb.). Banstead Downs, Surrey, v.-c. 17 (leg. Wallace, 8/1926; Ref. 24, as *R. rusticanus* Merc., Wats. E.C.), with more narrowed terminal leaflets.—Hruby, J. (1934 A: 387).
- 185/56b. *R. SCHLECHTENDALII* Whe., f. *ANGLICUS* Sudre. Highmoor Wood, Almeley, v.-c. 36 (leg. Riddelsdell, 9/1926, as *R. mucronatoides* A. Ley, B.E.C. 1928 distr.). Not belonging to *R. mucronifer* Sudre, f. *mucronatoides* (A. Ley), because the term lfts. of the turion leaves are ovate-round with projecting apex, but here are longish obovate with weakly cordate base with broader and longer almost truncate apex.—Hruby, J. (1934 A: 386).

- — f. *GENUINUS* Sudre. Freeland, v.-c. 23 (leg. Riddelsdell, 6/10/1926, B.E.C. 1928 distr.).—Hruby, J. (1934 A: 386).
- 185/63(2). *R. GRISEOVIRIDIS* Bart. & Ridd. (1933: 204).—*R. adscitus* auct. angl. plur., non Genev.
- 185/63. *R. ADSCITUS* Genev. *R. macrophylloides* auct. angl. p.p. Devon and Cornwall.—Bart. & Ridd (1933).
- Three different brambles have come to be known by this name in Britain. True species occurs in v.-cs. 1-5, 10, 69. The second sheet issued in the Set of British Rubi under this name from Dorset is 185/63(3). *R. prolongatus* Boul. & Let. in Corbière's Fl. de Normandie (1893), 203, treated by Boulay as a subspecies of *R. hypoleucus*. This occurs in v.-cs. 1, 4, 9, 14, 16, 17, 35, 36, 41, 45, 46, 49. The third plant often determined by Rogers as *R. adscitus*, but not issued in the Set, is now described as 185/56(2). *R. conspersus* Watson. It is best placed in the *Vestiti* near *R. Schlechtendalii* and is distributed over an area of 150 square miles in N. Hants, W. Sussex, and Surrey.—Watson (1935 B).
- 185/63(4). *R. MICANS* (Godr.) Sudre, var. *MICANS* (Godr.) Sudre, f. *OBSECTIFRONS* Sudre. Shotover, v.-c. 23 (leg. Riddelsdell, 8/1926, as *R. Powellii* Rogers f., B.E.C. 1928 distr.). By the prickles and glands not possibly *R. Lejeunii* Whe., f. *Powellii* (Rogers).—Hruby, J. (1934 B: 364).
- 185/67. *R. VESTITUS* W. & N., var. *VESTITUS* (W. & N.), f. *PILIFER* Sudre. "Wood, Fittleworth, v.-c. 13 (leg. Riddelsdell, B.E.C. 1928 distr., as *R. leucanthemus* P. J. Müller ?)"—Hruby, J. (1934 B: 359).
- 185/72. *R. LASIOCLADOS* Focke (= *R. vestitus* × ? *Winteri* Sudre). Paddlesworth Court Wood, v.-c. 15, 7/1927 (leg. Riddelsdell, B.E.C. 1928 distr.).—Hruby, J. (1934 B: 359).
- 185/84. *R. APICULATUS* Whe, f. *CINEROSUS* Rog. Malpus, v.-c. 58 (leg. Riddelsdell, 8/1926, as *R. Newbouldii* Rogers, B.E.C. 1928 distr.). "From the weak turions before us certainly not *R. Newbouldii* (Bab). Rog., in which, besides, the turions are slightly furrowed."—Hruby, J. (1934 B: 363).
- 185/84e. *R. OBTUNCATUS* (P.J.M.) Sudre, var. *OBTUNCATUS* (P.J.M.) Sudre, f. *ANGUSTICUSPIS* Sudre. Freeland, v.-c. 23 (leg. Riddelsdell, 7/1917, as *R. setulosus* Rog. f., B.E.C. 1928 distr.).—Hruby, J. (1934 B: 366).
- 185/85. *R. MELANOXYLON* M. & W. Stoke Wood, near Oxshott, Surrey, v.-c. 17 (leg. E. C. Wallace, 7/1927, Ref. 30, Wats. E.C.). Moderately typical.—Hruby, J. (1934 B: 365).
- 185/89. *R. INFESTUS* Whe., var. *DREJERI* G. Jensen (teste W. M. Rogers). Durdham Down, Bristol, W. Glos. (leg. White, 8/1927, Wats. E.C.).—Hruby, J. (1934 B: 364).

- 185/91. *R. ERICETORUM* Lefv. ex Genev. *R. anglicanus* Rogers. Bart. & Ridd. (1933: 208). × *mucronatus*, var. *nudicaulis* (Bart. & Ridd., 1933: 220). × *pubescens*, var. *subinermis* (Bart. & Ridd., 1933: 220).
- 185/93. *R. RUDIS* (W. & N.), var. *RUDIS* (W. & N.) Sudre, f. *ARGUTI FOLIUS* M. & Lef. "Colan, near Newquay, W. Cornwall (leg. C. C. Vigurs, 7/1909, Wats. E.C., Herb. Rilstone, as *R. plinthostylus* Genev.). Since the turions are almost glabrous and the general appearance ('habit') does not correspond to the *Hystrices*, I put the plant to the *Rudes*."—Hruby, J. (1934 B: 365).
- 185/94(2). **R. Schmidelyanus** Sudre, f. *SILVULICOLUS* Sudre. Hedge by a wood near Walton-on-the-Hill, Surrey (leg. D. G. Catcheside, 7/1926; Watson B.E.C. as *R. cenomanensis* Sudre, var. *Bloxamianus*). Not *R. cenomanensis*, because the term. lfts. of the leaves of the sterile shoots are quite different and the toothing coarse.—Hruby, J. (1934 B: 362).
- 185/96. *R. REGILLUS* A. Ley. This is placed by Hruby, J. (1934 B: 364) as a forma of *R. fuscus* Whe., var. *apiculatiformis* Sudre.
- 185/99(3). *R. GRANULATUS* M. & L., f. *MENTITUS* P. J. Müller. Wood by Green Wrythe Lane, Mitcham, Surrey (leg. E. C. Wallace, 8/1927, "Ref. 43 f.?", Wats. B.E.C.). "Difficult to determine without flowers."—Hruby, J. (1934 B: 364).
- 185/99(3)b. — — var. **traunsteiniensis** Kaufm. Arbrook Common, Surrey (leg. E. C. Wallace, Ref. 12).—Hruby, J. (1934 B: 364).
- 185/99(3)c. — — var. **obovatifrons** Sudre. Colley Hill, Surrey (leg. E. C. Wallace, Ref. 35).—Hruby, J. (1934 B: 364).
- 185/100. *R. BABINGTONII* Bell, Salt. Downs near Devil's Dyke, v.-c. 13 (leg. Riddelsdell, 7/1926, B.E.C. 1928 distr.)—Hruby, J. (1934 B: 365).
- 185/102. *R. LEJEUNEI* Wh. There has been confusion between this species and *R. ericetorum* Lef. due to errors in the original description of the former. Focke finally decided that the bramble gathered by him at Godalming and in Dorset was *Lejeunei*, not *ericetorum*.—Watson (1935 B).
- 185/104. **R. Moylei** Bart. & Ridd. (1933: 210). *R. ericetorum* auct. angl. non [Lefev.] Genev. b. *cuneatus* (Rogers & Ley) Bart. & Ridd. (1933: 221). c. *scoticus* (Rogers & Ley) Bart. & Ridd. (1933: 221).
- 185/106. *R. WEDGWOODIAE* Bart. & Ridd. (1933: 212). *R. mutabilis* Rogers' Handb. non Genev. × *rusticanus* (Bart. & Ridd., 1933: 221). b. Var. *Naldretti* (White) Bart. & Ridd. (1933: 221). e. Var. *Sabrinae* Bart. & Ridd. (1933: 212).
- 185/108(2)b. *R. THYRSIFLORUS* Whe., var. **caliginosus** Sudre. Clifton, Bristol (leg. White, 8/1904, as *R. rudis* Weihe; no. 436: B.E.C.).

- "Certainly not *R. rudis* Whe., since the armature and glandulosity are much too poor. Also agrees well with the figure (T. cxlviii) in Sudre (M.R.E., f. 20), only the prickles of all parts are even weaker.—Hruby, J. (1934 B: 364).
- 185/110(2) (=110b). *R. NUTICEPS* Bart. & Ridd. (1933: 217). *R. fuscus*, var. *nutans* Rogers' Handb.
- 185/110(3) (=110c). *R. MACROSTACHYS*, var. *FIMBRIFOLIUS* M. & Wirtg., f. *HYPOLEUCOIDES* Sudre. Near Burwardsley, v.-c. 58 (leg. Riddelsdell, 8/1926; B.E.C. distr. 1928, as *R. adenanthus* Boul. et Gill.).—Hruby, J. (1934 B: 359).
- 185/110(4) (=110d). *R. OBSCURUS* Kalt., f. *OPULENTUS* M. & L. Near Fittleworth, v.-c. 13 (leg. Riddelsdell, 7/1926, as *R. durotrigum* R. P. Murray: B.E.C. 1928 distr.).—Hruby, J. (1934 B: 365).
- 185/110(4)b. — — var. *calvifrons* Sudre. Wolford Heath, v.-c. 33 (leg. Riddelsdell, 8/8/1926, as *R. hostilis* M. & W.; B.E.C. 1928 distr.).—Hruby, J. (1934 B: 365).
- 185/114. *R. MORGANWGENSIS* Bart. & Ridd. (1933: 218). *R. horridicaulis* Rogers' Handb., non Müller. Var. *Devoniae* Bart. & Ridd. (1933: 219).
- 185/115(2). *R. microdontus* Muell. & Lef. The Boar's Hill, Berks, bramble known as *R. scaber* Wh. should be called *R. microdontus*. It is recorded from v.-cs. 14, 16, 19, 21-4. Hybrids occur on Boar's Hill with *R. caesius* and *R. vestitus*.—Watson (1935 A).
- 185/123. *R. HYSTRIX*, f. *VELATUS* Lef. Cissbury, v.-c. 13 (leg. Riddelsdell, 7/1926, as *R. hystrix*, var. *bercheriensis* Druce). "*R. bercheriensis* Druce belongs (according to Sudre) to var. *rufescens* L. & M., for which the inflorescence is too little and too weakly armed; but the plant is also not typical enough for var. *rubicundus* P.J.M., since this has more strongly haired turions and fine-toothed leaves."—Hruby, J. (1934 B: 366).
- 185/124. *R. ADORNATUS* P. J. Müller. Sandling Park, v.-c. 15 (leg. Riddelsdell, 7/1927, B.E.C.). "Typical."—Hruby, J. (1934 B: 366).
- 185/122. *R. RILSTONEI* Bart. & Ridd. (1933: 213). *R. plinthostylus* Rogers' Handb., p.p., non Genev.
- 185/145b. *R. TERETICAULIS* (P.J.M.) Sudre, var. *curtiglandulosus* Sudre, sf. *UMBROSUS* Sudre. Near Sapey Common, v.-c. 36 (leg. Riddelsdell, 9/1927, as *R. minutiflorus* Müller: B.E.C. 1928 distr.).—Hruby, J. (1934 B: 367).
- 185/151b. *R. semialterniflorus* Sudre (= *R. alterniflorus*—*caesius*), f. *SUBLUSTRIS* Lees. Intermediate between *R. alterniflorus*—inflorescence almost exactly like this, as well as the whitish felt on underside of leaves, and *R. caesius*—turions weakish, roundish to blunt-angled, mostly suffused with red (cf. *R. ambifarius* P.J.M.); leaves mostly incompletely 5-nate, outer leaflets sessile, round, broadly acuminate, base weakly rounded. Near Rollbright Stones, v.-c. 23 (leg. Riddelsdell, 3/8/1926, B.E.C. 1928 distr., as nearest *R. sublustris* Lees).—Hruby, J. (1934 A: 387).

- 189/7. *POTENTILLA REPTANS* L. Souèges (1935 B) describes the appearance of an adventive embryo, originating close to the normal embryo, apparently from a cell of the ovary tegument wall.
190. *ALCHEMILLA* L. A key to the Esthonian, Latvian, and Lithuanian species is given by Zamelis (1933), many British forms being mentioned. Their distribution and a scheme of morphological relationship are also given.
- 193/4. *SANGUISORBA OFFICINALIS* L. The stamens of this insect-pollinated species are compared with those of the wind-pollinated *S. minor* Scop. [*Poterium Sanguisorba* L.] by Heller (1935 B).
194. *ROSA* L. An account of the roses of Neumark (*i.e.*, all Brandenburg east of the River Oder), including descriptions of every infra-generic group there represented, partial running keys to many infra-specific groups, and Latin descriptions of certain new varieties and forms of *R. omissa* Déségl., *R. tomentosa* Sm., *R. agrestis* Savi, *R. elliptica* Tausch, and *R. Afzeliana* Fries, is given by Schenk (1934).
195. *PYRUS* L. The lenticels which form the spots or dots on the fruits have been studied by Clements, H. F. (1935) in 18 horticultural varieties of apple. They may be open or closed to the passage of gases. The number varies within limits characteristic of the variety, but is affected by the water supply in the earlier stages of development.
- 195 (2). *SORBUS* L. Cytological investigation has confirmed Hedlund's views on the relative age of certain European species, those which he regarded as more primitive being found to be diploids ($n = 17$), while species which in his view were derivative are now shown to be polyploids.—Liljefors (1934).
- The Irish distribution of the segregates is in striking contrast to their distribution in Britain. *S. Aria* is only known round Galway. *S. porrigens* is the prevailing form, having been recorded from 16 v.-cs. from Kerry and Wexford in the South to Dublin and Sligo.
- S. rupicola* is widely but sparingly spread from Killarney to Londonderry, the very rare *S. anglica* has been found at Killarney only, and *S. latifolia* is probably native in the south-eastern counties.—Praeger (1935).
- 195/7(2). *S. LEYANA* Wilmott (1934: 78). Breconshire, near Dan-y-graig. Distributed by A. Ley as *S. scandica* and localised "Cefn Coed."
- 195/14. *S. LATIFOLIA* Lam. British plants are not the same as Lamarck's type from the Forest of Fontainebleau. Three forms are described as new by Wilmott (1934), and the "var. *decipiens* Bechst." disappears from the list.
- 195/14(2). *S. BRISTOLIENSIS* Wilmott (1934: 76). The *S. latifolia* and var. *decipiens* of the Avon Gorge; very uniform.

- 195/14(3). *S. SUBCUNEATA* Wilmott (1934: 76). The *S. latifolia* and var. *decipiens*, *intermedia*, *rotundifolia* and *scandica* of near Minehead (Greenaleigh); again a uniform plant which has received very varied names.
- 195/14(4). *S. VAGENSIS* Wilmott (1934: 78). *S. latifolia* of the Wye Valley: Symonds Yat, etc. (at least in part, as several slightly different forms occur).
199. *SAXIFRAGA* L. Chromosome numbers:—*S. nivalis*, $n = 14$; *S. stellaris* (Norway), $n = 14$; *S. Geum*, $n = 14$; *S. umbrosa*, $n = 14$; *S. umbrosa* \times *Geum* (cultivated strain which "looked rather intermediate"), $n = 14$ generally, but some pollen mother cells showed a few univalent chromosomes; *S. tridactylites* (wild from Copenhagen), $n = 11$; *S. granulata* (Denmark), $n = 46-57/2$ and $60/2$, and discussion of previous examinations indicates general variability—a "structural hybrid" (p. 37): the variation is not due to crossing in Denmark, where the only other native species are *S. tridactylites* and *S. hirculus*; *S. cernua* (Norway), $n = c. 33$; *S. hypnoides*, $n = c. 44/2$ and $c. 58/2$; [*S. caespitosa* (cultivated varieties), $n = 56/2, 60/2, 63/2, 65/2$]; *S. aizoides* (Norway), $n = 13$; *S. oppositifolia* (Norway), $2n = 26$.—Skovsted (1934).
- 199/13. *S. DECIPIENS* Ehrh. Map of distribution in Moravia by Suza (1935: 480).
203. *CHRYSOSPLENIUM* L. Chromosome numbers known, $n = 21, 24$; *C. alternifolium* L., $n = 24$.—Skovsted (1934).
- 211/1(2). *S. SPURIUM* M.B. Chromosomes, $2n = 28$ (Baldwin, 1935: 561).
- 211/3. *SEDUM REFLEXUM* L. Chromosomes, $2n = 34$ or 68 (Baldwin, 1935: 561).
- 211/7. *S. ALBUM* L. Chromosomes, $2n = 64$ (Baldwin, 1935: 561).
- 220/7(2). *Epilobium adenocaulon* Hausskn. This is an American species which has been noticed abundantly in S.W. Surrey for several years. It is distinguished by its upright growth much branched above, reddish stems, numerous very small flowers, patent pods, glandular clothing, short entire stigma, and seeds with a small pelucid beak protruding from the testa. The plant is found in woods, stream-sides, gardens, and waste places, and has been recorded from v.-cs. 12, 13, 16, 17. The following hybrids with native species are recorded:— $\times E. montanum$, in Surrey; $\times E. obscurum$, in Surrey; $\times E. palustre$, in N. Hants; $\times E. parviflorum$, in Surrey. This species has been known in Sweden for upwards of 30 years. Its taxonomic position is uncertain and it may be synonymous with, or a variety of, *E. glandulosum* Lehman. It was possibly introduced to Britain during the Great War, when there was a large Canadian camp at Witley, Surrey. The earliest [then known] British gathering seen was made by J. Fraser at Woking, Surrey, in June 1921.—Ash and Sandwith (1935).

Three specimens of this species in Herb. Druce antedate the previous earliest British record: Cropstone Reservoir, Leicester, v.-c. 55, August 1894, T. A. Preston; Malvern Link, Worcester, v.-c. 37, S. H. Bickham and R. F. Towndrow, July 1905; Woodchester, W. Gloster, v.-c. 34, H. J. Riddelsdell, July 1920. All the above were named by G. M. Ash. Also recorded from Colman's Moor, Berks, v.-c. 22, June 1928, G. C. Druce; near Henley, Oxon, v.-c. 23, 1935, Ash.—Chapple (1935).

223. *OENOTHERA* L. A key is given by Munz, P. A. (1935) (also full descriptions) of the subgenus *Raimannia*, which includes *O. odorata* Jacq., and *O. stricta* Ledeb. to which belongs most of the material named *O. odorata* [including the plant of our sandhills]. *O. odorata* has cauline leaves undulate or crisped and is often glaucous, petals 15-35 mm. long. *O. stricta* has leaves generally not crisped (if crisped the petals are shorter ["12-30 mm."]) and is not glaucous). *O. argentina* Lév. et Thell., which has been recorded from docks in Britain, is reduced to *O. indecora* Camb.—Munz (1935).
- UMBELLIFERAE. Chromosomes: number varies from 6-48 haploid (tables given) and 8 (not 11) is considered as the most probable basic number.—Wanscher (1934).
- 237/1. *HYDROCOTYLE VULGARIS* L. Chromosomes, $n = 48$.—Wanscher (1934: 63).
- 276/3. *PASTINACA SATIVA* L. The anatomy of the vegetative organs is described by Warning (1934). The floral axis is initiated during the first year and develops rapidly during the second.
291. *LONICERA* L. Feng (1934) notes the presence of a typical centrosome in the resting nucleus of pollen cells in *L. Xylosteum* L. (p. 38, pl. vi): somatic divisions are described (p. 55), and spiral spermatozoids figured (pl. vii).
296. *GALIUM* L. Chromosomes: *G. Mollugo*, L., $n = 11$; var. *latifolium*, a tetraploid, $n = 22$. The latter crossed with tetraploid *G. verum* gave fertile hybrid, $n = 22$. *G. erectum* Huds., $n = 22$ (i.e. tetraploid). *G. verum* L., ssp. *verum* (L.) Hayek and ssp. *litorale* (Bréb.)—both $n = 22$ (i.e. tetraploid); *G. uliginosum* L., $n = 22$; *G. palustre* L., $n = 33$; *G. boreale* L., $n = 33$ (i.e. hexaploid).—Homeyer (1935).
- 296/2×9. *G. MOLLUGO* L., var. *LATIFOLIUM* × *VERUM*. Description and account of genetics by Homeyer (1935: 253). Selfing of wild plant showed considerable variation in leaf form—the F_1 clearly segregates and "a special specific name should be avoided."
298. *ASPERULA* L. Chromosomes: *A. cynanchica*, $n = 22$ (but 11 in a "f. montana"); *A. odorata*, $n = 22$.—Homeyer (1935: 259).
308. [*SCABIOSA* L. Sect.] *KNAUTIA*. Szabo (1934) gives the result of work on material from France and Spain examined since the author's monograph of 1911. The classification and distribution

of the species are discussed and an enumeration is given, including several new species, varieties and forms. Under *K. arvensis* one new variety is described.

Cytological study by Jaeger (1934 B) shows that in *K. arvensis* $n = 8$ as usual in Dipsaceae.

- 308/5. *K. ARVENSI* (L.) Coult. Pollen grain and its nuclei described in detail by Jaeger, P. (1934 A).
- 90% of the pollen grains showed degeneration of the three nuclei, and were probably sterile, although grains without nuclei can produce a pollen tube of normal appearance.—Jaeger (1935).
- 318/20. *ASTER LINOSYRIS* (L.) Bernh. In open sunny places protected from wind this species behaves as a compass-plant (gnomon-plant), all its leaves turning to the South in the direction of the mid-day sun.—Huber (1935).
339. *AMBROSIA* L. An account of the species occurring in Italy. Besides the indigenous *A. maritima*, four species, *A. artemisiifolia*, *A. coronopifolia*, *A. tenuifolia*, *A. trifida*, and its var. *integrifolia*, have been introduced from America.—Vignolo-Lutati (1935).
- 353/1d. *BIDENS CERNUA* L., sub-var. *rugosa* Coss. & Germ., a form with the stem and branches clothed with numerous prominent patent yellow bristles. Breamore, S. Hants, and Heckfield, Berks.—Lousley (1935).
- 383/3×5. *SENECIO AQUATICUS* Hill × *JACOBAEA* L. Occurs very commonly in Ireland with fertile offspring and many intermediates; this hybrid may have been overlooked in Britain.—Praeger (1935).
- 383/5. *S. JACOBAEA* L. A study of the means of controlling this pest is made by Cameron (1935).
- 383/31. *S. CINERARIA* DC. An extract from this species having proved effective in cases of cataract, the distribution of the species is detailed by Turrill (1935 A): a Mediterranean species, chiefly on maritime rocks.
- 383/33. *S. SPATHULAEFOLIUS* Gmel. The Bulgarian plants which have been thus named are *S. procerus*, var. *neglectus*.—Stojanoff (1934).
- 395/3. *CARDUUS PYCNOCEPHALUS* L. (restr.). Comparison is made between *C. tenuiflorus* Curt. and the restricted *C. pycnocephalus* L., which were found growing together on Plymouth Hoe. The latter is occasionally found as an alien at seaports and is probably of alien origin, although it has been known at Plymouth since 1868.—Lousley (1935).
396. *CIRSIUM* Mill. Chromosome numbers of thirty non-British species found to be 17 (16 species), 34 (11 species), and 51 (3 species in one series).—Aishima (1934).
- 396/8. *C. ARVENSE* (L.) Scop. A discussion of the means and causes of the spread of this species in the state of Iowa.—Hayden (1934).

- 416/1. *CREPIS MOLLIS* Aschers. A sheet of this species in Herb. B. Reynolds, named *C. paludosa*, is labelled as from Co. Down, but Praeger was unable to find *C. mollis* in the locality in 1935 and there has probably been mixture of specimens.—Pugsley (1935 C).
- 416/3. *C. BIENNIS* L. The identification of a *Crepis* grown by the late Dr E. Drabble in the Isle of Wight from seed taken from a Herbarium specimen from N. Yorks in 1932 with *C. sporinoides* was incorrect. The plant was *C. biennis*. A synoptic table of the characters of these two species and *C. nicaeensis* is given by Babcock (1935).
435. *CAMPANULA* L. The taxonomy and distribution of many varieties and forms are discussed by Hruby, J. (1934 C). The species dealt with include *Campanula rotundifolia*, *C. patula*, *C. rapunculoides*, and *C. glomerata*.
- ERICACEAE.** Pollen grains of the following species are described and mostly (indicated by *) illustrated by Overbeck, F. (1934):—*Erica cinerea* and **E. tetralix*, **Calluna vulgaris*, *Sedum palustre*, **Loiseleuria procumbens*, *Phyllococe coerulea*, **Andromeda polifolia*, **Arctostaphylos uva-ursi* and *A. alpina*, **Vaccinium vitis-idaea*, **V. myrtillus*, **V. uliginosum*, **Pirola secunda*, *P. minor*, *P. media*, **P. rotundifolia*, and **Moneses uniflora*.
- Chromosomes: Wanscher (1934)—*Erica cinerea*, $n = 12$, shows secondary associations, probable maximum 3-3-3-3; *Phyllococe coerulea*, $n = 12$ (Hagerup reports 6 but his drawings and slides show 12), shows at least five groups of two or three; these groupings indicated 4 and not 6 as the probable basic number of the *Bicornes*.
441. *ARCTOSTAPHYLOS* Adans. A key and descriptions of the 53 known species. Our British *A. Uva-ursi* is included, but *A. alpina* is not mentioned since it is now almost universally regarded as constituting the independent genus *Arctous*.—Eastwood (1934 B).
- 441/2. *A. ALPINUS* (L.) Spreng. long known to British botanists as *Arctostaphylos alpina* L., is keyed off from *Arctostaphylos* by the deciduous leaves into the genus *Arctous*.—Eastwood (1934 A).
- 446/4. An account of the very limited range in Cornwall of *Erica ciliaris* L. and its hybrid with *E. Tetralix*.—Vigers and Rilstone (1935).
453. *PYROLA* L. A key to the four Belgian species is given by Hauman (1934).
- 456/1. *MONOTROPA HYPOPITYS* L. The relation of this species to its mycorrhiza throughout its life-history is described by Francke (1934).
467. *ANAGALLIS* L. *A. arvensis* L. has leaves generally ovate, but plants occur with lower leaves ovate and upper lanceolate. The colour of the corolla is typically scarlet but plants are also found with salmon, flesh (var. *carnea*), and blue corollas. On selfing all

- breed true through several generations. All the colours cross readily together and the F_1 and subsequent families are fully fertile. *A. foemina* Mill. has lower leaves ovate, upper lanceolate. The corolla is blue, but of a shade different from *A. arvensis*: by Ridgway's Colour Standard the shade is greyish violaceous blue in *A. foemina*, deep dull bluish violet in *A. arvensis*. The differences between the "species" are in the corolla only. Salmon-coloured *arvensis* gives a fertile F_1 with *foemina* and a highly segregating F_2 . *A. foemina* should only be regarded as a variety of *A. arvensis*.—Marsden-Jones (1935 A).
471. FRAXINUS L. A study of the bud-scales, leaf-scars, twigs, etc., of certain species (including *F. excelsior*) and a key for identifying them in the winter condition, is followed by useful descriptions and figures.—Whelden (1934).
- 478/1. CENTAURIUM UMBELLATUM Gilib. The development and differentiation of the growing stem tissues are described in detail with figures.—Halmai (1935).
- 480/7. GENTIANA ULIGINOSA Willd. is regarded as specifically distinct from *G. Amarella* L., following Murbeck's view. An interesting account of their morphology, taxonomy, ecology, biology and local distribution in northern Neumark, Brandenburg, is given by Libbert (1935).
- 505/1. MERTENSIA MARITIMA (L.) Gray. Distribution detailed by Tolmatchew (1934)—Arctic Europe and North America, but not Siberia: rather like that of *Halianthus peploides*, but much more local and extending less far south on the coasts of the Atlantic and the Pacific coast of America; only on the Pacific coast of Asia, where it is quite common, does it reach as far south as *H. peploides*.
- 517/7. SOLANUM ROSTRATUM Dun. Recorded from France (Vendée) by Dop, P., and Gaussen, H. (1934), and fully described.
522. DATURA L. Following treatment of pollen by radium, normal plants, with chromosomes $2n$ and $3n$, have been obtained in various ways.—Satina and Blakeslee (1935).
527. VERBASCUM L. The development of the embryo in *V. Blattaria* is of exactly the same type as that of *Veronica arvensis* and *Mentha viridis*.—Souèges (1935 A).
- 541/1. DIGITALIS PURPUREA L. Characters of the epidermis and hairs of the leaves are described and figured in detail from many parts of Europe (none from the British Isles), and compared with other species of the genus by Oehm (1935). The hairs are variable.
543. VERONICA L. A new variety of *spicata* L., var. *austrobulgarica*, is described by Degen (1934), with densely hairy stems and leaves, and ciliate capsules and calyces.
545. EUPHRASIA L. The occurrence of *E. tenuis* in the Tatra mountains on the borders of Czechoslovakia and Poland is recorded by

- Györfy (1934 B), and its short and early flowering period described. It is considered a distinct species.
- 546/4. *BARTSIA VISCOSA* L. A Belgian record for this species is described by Goffart and Sternon (1935).
- 549/3. *MELAMPYRUM PRATENSE* L. A paper by C. E. Britton deals with the British distribution of the varieties and is complementary to the paper by the same author in Rep. B.E.C. for 1934. The main division into two subspecies, *eu-pratense* Beauv. and *vulgatum* Beauv., is abandoned. Var. *foliatum* Neum. appears in Br. Pl. List, ed. ii, "Sussex, Tyrone." According to the present author the Sussex plants so named are in reality an early summer condition of the var. *lanceolatum*, and the Clogher Valley, Tyrone, plants are the var. *typicum* Beck. Var. *foliatum* therefore disappears from the British List. The varieties admitted and the vice-counties from which they are recorded in this paper are:—Var. *typicum* Beck.; 92, H36. Var. *alpestre* Beauv. (as the sub-var. *scotianum* Beauv.); 89, 110. Var. *ericetorum* D. Oliver; 5, 14, 17, 18, 58, 86, 88, 92, 100. Var. *commutatum* (Tausch) Beck., including sub-var. *concolor* (Schönheit) Beauv.; 16, 34, 35, 69. Var. *vulgatum* (Pers.) Beck., sub-var. *laurifolium* Beauv.; 7, 9, 10, 11, 15, 16, 22, 23, 37. (Note.—V.-c. 12 is given in the paper but the locality, Bishopstoke, is in S. Hants). Var. *ovatum* Spenn.; 2, 15, 16, 17, 22, 23, 33, 34. Var. *lanceolatum* Spenn. ("no doubt the most common form of the species"); 14, 16, 17.—Britton (1935).
- Stomata: see Smith (1935: 456).
- 551/1. *LATHRAEA SQUAMARIA* L. The glandular tissue of the rhizome scales shows similarities with bladders of *Utricularia*; there is a potential difference of 20 MV. between the epidermis and glandular layer, and the excretion is similarly alkaline.—Nold (1934: 440, 446).
- 552/1. *UTRICULARIA VULGARIS* L. The function of the bladders has been thoroughly investigated by Nold (1934). The winding up of the mechanism is not due to growth but to the expulsion of water, which can be observed both in paraffin oil and in a damp chamber. Calcium and potassium salts are expelled with the water; excretion from the bladders is rhythmic (and alkaline). A suitable electrometer shows a difference in potential of 40-50 MV. between the four partite hairs on the inner (positive) and outer (negative) sides of a normal bladder. The normal functioning of bladders in a "phosphate-buffer" [i.e., a solution which maintains a constant pH. value] is possible only up to pH. value 7, and the pH. value in natural habitats of the plant is, according to measurements, always less than 7.
558. *MENTHA* L. The nature and origin of the polymorphy in this genus is discussed by Trautmann (1934). The following abstract

is by Mr A. L. Still (whose rough translation of the whole paper is in the Nat. Hist. Mus. library).

The author has previously expressed his opinion that the great majority of the Mints are hybrids, not only between the accepted species, but between distinct types which occur within the species.

This opinion has been challenged, so the author brings further arguments forward to support it, with special reference to the forms of *M. longifolia* Huds., which are such an important feature of the Mint flora of Hungary and the Balkans.

He recognises a continuous series of forms, beginning with the riparian, large-leaved, green and sparingly hairy, ramose *M. cuspidata* (Op.) Trtm. and ending in the small-leaved, simple, woolly *M. retinervis* (Borb.) Trtm. from dry situations, with a vast number of intermediates. His opponent maintains that these forms have arisen from *M. cuspidata* (Op.) by a process of mutation consequent on the gradual change from a wet to a dry habitat. This view the author considers to have been arrived at by comparison of simple forms from widely separated localities, so that no connection can be traced between them. From his study of complete collections from restricted areas he claims that the differences cannot be related to ecological conditions, but should be attributed to hybridity. Among the hundreds of forms of *M. longifolia* Huds. (sensu lato) occurring in Hungary the author recognises, so far as his researches have progressed, 30 or 40 types, from which he contends the remaining forms have arisen by crossing. He does not overlook the problem of "mosaic-hybrids." The actual types occur rarely in comparison with the abundance of the hybrids.

In the author's opinion, the difficulties surrounding the determination of Mints can only be solved by making and studying complete collections of Mints from rather small but rich areas. In this way he thinks that the types can be decided upon and their influence in the hybrid forms detected. Once the types are recognised, the comparison of gatherings from widely separated areas will take on a phyto-geographical importance.

In the author's opinion the older monographers failed to grasp this aspect of the problem, because their material was drawn in small quantities from too wide an area, so that the connecting links between his so-called types were missing.

[By way of comment, it may be said that his idea of the importance of exhaustive collection from small areas is undoubtedly sound. With regard to the possibility of recognising "types" which would command general acceptance, one cannot entirely share the optimism expressed by the author.—A.L.S.]

Fourteen new mints are described with Latin diagnoses, 10 new subspecies and 3 new varieties of *M. longifolia*, and one new subspecies of *M. aquatica*.—Trautmann (1935).

- 558/13×1. *M. ARVENSIS* L. × *ROTUNDIFOLIA* (L.) Huds., of spontaneous, not cultivated, origin, found at Salcombe, S. Devon, v.-c. 3. Two forms of this hybrid were named by F. Schultz *M. Wohlwerthiana* and *M. Muelleriana*. Two other forms of this hybrid are *M. stachyoides* Host and *M. arvensis*, var. *micrantha* F. Schultz. The Salcombe mint is described as *M. Muelleriana* F. Schultz, var. *serratifolia* Pugsley.—Pugsley (1935 A).
- 566/1. *SALVIA PRATENSIS* L. See Hruby, K., 1934. Originally a south european pontic species, it is now spread over the whole Mediterranean. Many varieties are named and described. Germination about 30 hours after wetting. Chromosomes $n = 9$; $2n = 18$, two pairs large and two smaller, one sometimes with satellites.
- 586/1. *TEUCRIUM SCORODONIA* L. The associations in which the species grows in Valois are described by Jovet (1934).
- 587/4. *AJUGA CHAMAEPITYS* (L.) Schreb. Distribution map of species and account of geographical variation by Turrill (1934), the peculiarities of the British form being given in detail (p. 219), with figures of nutlets and flowers (p. 227).
588. *PLANTAGO* L. Among a number of species tested with regard to the influence of light on germination, *P. lanceolata* and *P. media* are "indifferent," i.e., show the same germination results in light as in darkness, while *P. major* and, to a less marked degree, *P. Coronopus* and *P. maritima*, definitely prefer light. A very few (non-British) species, e.g., *P. arborescens* and *P. Cynops*, apparently germinate best in darkness.—Witte (1935).
- 588/5. *P. MARITIMA* L. and its allies. Var. *integralis* (Gaudin) Pilger is not known to be British. Sub-var. *Hudsoniana* (Dr.) Pilger = *P. maritima* L., γ *serpentina* Brand, f. *ciliata* Williams, and δ *alpina* Williams = *P. Hudsoniana* Druce = *P. montana* Huds. sec. Druce. Has been recorded from Caernarvon, Durham, Cumberland, Perth, Skye and Unst. Sub-var. *parvula* Pilger = *P. maritima* L., δ *alpina* Williams, f. *pumila* Kjellman = *P. maritima* L., f. *angustissima* Grevillius. Recorded from Unst, Sutherland and Shetland. Var. *minor* Hook. = *P. maritima*, δ *alpina* Williams, f. *hirsuta* Williams = *P. maritima* L., var. *lanata* Edmondston ex Williams = *P. Edmondstonii* Druce. A small form with thick rhizome, leaves linear-lanceolate to lanceolate, 1.5-3 (-4) cm. long, 2-3 (-4) mm. broad, with greyish-white basal wool; peduncle 4-10 cm. Spikes small, 0.5-3 cm.; Orkney and Shetland.—Pilger (1935).
- 588/8. *P. LANCEOLATA* L. The stamens of this wind-pollinated species are compared in detail with those of the insect-pollinated *P. media* L. by Heller (1935 B).
- 588/8h. — — var. *ANTHOVIRIDIS* Wats. This var. is widely though sparingly distributed and may be recognised by the more erect stamens on shorter filaments with greenish-yellow anthers.

There is also a difference in the pollen: in one form the pollen grains are about half the width of normal grains and lacking the granular contents, in another form 10% of the pollen grains are normal, the remainder as described above.—Rilstone (1935).

600. *CHENOPODIUM* L. Chromosome numbers given by Kjellmark, 1934 (and those given by Winge in 1917) are:—*C. album*, 27 (four forms: Winge says 9); *C. hybridum*, Winge says 9; *C. murale* ("9," Winge); *C. rubrum*, 18; *C. Vulvaria* ("9," Winge); *C. bonus-Henricus* ("18," Winge). *C. hybridum* $2n = 36$; *C. album*, $2n = 36$.—Cooper (1935).
606. *ATRIPLEX* L. A classification of this genus on a basis of the leaf structure is attempted by Moser (1934: 385), but the British species remain in the same groups. Chromosome numbers given by Kjellmark (1934: 139):—*A. patula* 9, *A. hortensis* 9. *A. hastata* L., $n = 18$, reported by Cooper (1935); Winge found *A. hastata*, $2n = 18$, and *A. patula*, $2n = 36$.
611. *SALICORNIA* L. Effect of tide on populations of *S. europaea* quantitatively described by Wiehe (1935).
- 613/1. *SALSOLA KALI* L. Chromosomes, $n = 18$.—Cooper (1935).
- 618/4. *RUMEX ELONGATUS* Guss. from Thames-side has remained constant in cultivation: similar plants from Medway, W. Kent.—Lousley (1935).
- 618/29. *R. OBOVATUS* Dans., var. *CORDATUS* C. Blom, is distinguished as new on account of its distinctly cordate lower leaves. It occurred as a casual near Göteborg, Sweden.—Blom (1934 B).
- 621/1. *ASARUM EUROPAEUM* L. Observations on the distribution of the seeds over short distances by snails, which eat the "nectar-cells" of the lower part of the perianth and also the seed-arils, the seeds themselves resisting digestion. Distribution of seeds through the agency of ants (myrmecochory) is of rare occurrence.—Wallner (1935).
625. *HIPPOPHAE* L. The species of this genus are sunk into *Elaeagnus* by Nelson (1935): a brief key and synopsis are added. *Elaeagnus rhamnoides* (L.) A. Nelson, n.-comb.
628. *EUPHORBIA* L. A discussion of species-relationship as shown by the electrophoresis of latex. British species examined were:—*E. Lathyris*, *E. pilosa*, *E. platyphyllos*, *E. virgata*, *E. Esula* and *E. Cyparissias*. The reactions of latex from *E. virgata*, *E. Esula* and *E. Cyparissias* were found to be very similar.—Moyer (1934).
- 631/1. *BUXUS SEMPERVIRENS* L. A full account of the *Buxus* society in the Enntal (Upper Austria), with discussion of its origin and age, is given by Rohrhofer (1934): the species is protected there.
- 632/2. *MERCURIALIS ANNUA* L. The cytology of the intersexual flowers and of the abscission zone is studied by Yampolsky (1934 A and B).

633. **ULMUS L.** The British species are described and well illustrated by Bancroft (1934), Elwes and Henry's nomenclature being used. The species described are:—I. Goodyer or Small-leaved Elm (*U. minor*, p. 122, fig. 52, and cf. p. 180); II. *U. montana* and *U. nitens* (p. 139, figs. 57 and 58); III. The Cornish Elm (*U. stricta*, p. 208, fig. 86), with a note on the Wheatley Elm; IV and V. Elms generally accepted as hybrids: Huntingdon Elm (p. 244, fig. 98), Dutch Elm (p. 298, fig. 120); VI. The Common or English Elm (p. 334, fig. 134); VII. Conclusions and Bibliography (p. 372). "The number of . . . true species is limited, but that . . . of varieties and of hybrid and intermediate forms . . . is indefinite and incalculable."
- 633/4. **U. MINOR** Mill. sec. Henry (Goodyer's Elm). The growth of a seedling established in a crevice of the masonry of a Cambridge wall is described by Dallimore (1934).
- AMENTIFERAE (and SALICACEAE).** The development of the male catkins is detailed by Heller (1935 A). They begin to form in spring or summer of the year before they flower. Some (*Alnus*, *Betula*) are covered by a coating of resin during the winter, others (*Corylus*) by a mat of hairs, others by woody scales and woody hairs, but there is no lignification when the catkins are completely covered in winter by bud scales (e.g., *Fagus*, *Quercus*, *Populus*). Many other anatomical and developmental details are given.
- For detailed study of the stamens of *Alnus glutinosa*, *Betula pendula*, *Carpinus Betulus* L., *Corylus Avellana* L., *Fagus sylvatica* L., and *Quercus pedunculata* L., see Heller (1935 B).
- 644/1. **CARPINUS BETULUS L.** The northern and western distributional limits of the Hornbeam, illustrated by a map, are compared with those of the Beech by Erdtman (1934).
- The reactions of the tissues to the eggs and larvae of *Perrisia carpini* and the migration of the larvae is described by Christmann (1934).
- 645/1. **CORYLUS AVELLANA L.** An account of the development of the catkin and the pollen, discussing their reactions to the cold of winter, and the difference between morphological and physiological maturity.—Foa (1935).
646. **QUERCUS L.** It is certain that *Q. Robur* L., Sp. Pl., 996 (1753) is the pedunculate oak, cited by most Continental authors as *Q. pedunculata* Ehrh., but there is confusion as to the correct name for the sessile oak, variously cited as *Q. Robur* Miller (1768), *Q. sessilis* Ehrh. (1789), and *Q. sessiliflora* Salisbury (1796). Though there is no doubt at all what species Ehrhart intended, his name was published without description and most modern authors prefer *Q. sessiliflora* Salisb. Mattuschka (Fl. Siles., ii, 375, 1777) gave a detailed description in German of a *Q. petraea*, but he cited it as a variety of *Q. Robur* L. and it is therefore inadmissible as a specific epithet. But the name appears again

- in Lieblein's Fl. Fuldensis, 403, 1784, where it is cited as "*Quercus petraea* Linn." with a description in German. The name *Q. petraea* Lieblein is proposed for the sessile oak. For the third species of oak native to Germany the name *Q. pubescens* Willd. is preferred to *Q. lanuginosa* Lam., which is held to be synonymous with *Q. Cerris* L.—Schwarz (1935).
649. FAGUS L. A study of the leaf characters used for distinguishing *F. sylvatica*, *F. orientalis*, and a new species or subspecies *F. moesiaca*, which is said to lie between the two both in taxonomic characters and in area of distribution.—Czeczott (1934).
650. SALIX L. Ecological study of the Willows of the western part of the Isle of Wight by Buxton (1934).
651. POPULUS L. The origin and development of sucker buds on the roots into sucker shoots is described anatomically by Brown (1935).
P. nigra, *P. trichocarpa*, and *P. tacamahacca* are species growing in Britain which are among the parents of new hybrids recently artificially obtained in the nursery of the Oxford Paper Company at Frye, Maine, U.S.A. The new hybrids are being propagated by cuttings and a special horticultural name has been given to each clone.—Schreiner and Stout (1934).
- 651/2. P. TREMULA L. The development of the male catkins is detailed by Heller (1935 A); see *Amentiferae*. For details of the stamens see Heller (1935 B).
652. EMPETRUM L. The differences in the distributions of *E. nigrum* and *E. hermaphroditicum* in Sweden are detailed by Arwidsson (1935). Chromosomes: *E. nigrum*, $n = 13$, maximum association 3-3-3-4. *E. hermaphroditicum*, $n = 26$, also shows associations pointing to a lower basic number than 13.—Wanscher (1934).
- 652/1. E. NIGRUM L. Pollen described and figured by Overbeck, F. (1934).
- 652/2. E. HERMAPHRODITICUM (Lge.) Hagerup. There is an earlier but invalid name for this species. In Herb. Hooker at Kew there is a specimen labelled "Highlands of Scotland, 1807." Attached to the sheet is a slip of paper with an enlarged drawing of the flowers by Sir W. Hooker and a note in his hand, "Hermaphrodite! *E. scoticum*." The name is invalid under Article 37 of the Rules of Nomenclature.—Pugsley (1935 D).
- 655/1. STRATIOTES ALOIDES L. Experiments are described in detail by Vegis (1933) showing the effect on turion-production of various periods of immersion in water between 35° and 100° C.
669. ORCHIS L. *O. latifolia* of Linnaeus is the plant which has been generally known in recent times as "*O. incarnata* L.": the plant named by Linnaeus *O. incarnata* was a flesh-coloured form of *O. sambucina* L. These are the two principal theses of Pugsley (1935 E), referred to at greater length elsewhere in this Report. The species covered by this paper are arranged as follows:—

O. latifolia L., sensu stricto = *O. incarnata* auct. non Linn.
 Var. **Gemmana** Pugsley, a tall, leafy form with long bracts; var.
ochroleuca (Boll.) Pugsley; var. *pulchella* (Druce) Pugsley; var.
coccinea Pugsley = f. *atrirubra* Godfery; var. **cambrica** Pugsley.
O. cruenta Mull. Not British, now first recorded for Switzer-
 land.

O. praetermissa Druce.

O. pardalina Pugsley = *O. latifolia* auct. non Linn., probably
 = *O. latifolia* L., var. *junialis* Vermeulen.

O. purpurella Steph. Var. *pulchella* (Druce) Pugsley, trans-
 ferred from *O. praetermissa* Druce.

O. majalis Reichb. Not British. Var. *pinguis* (A. & G.)
 Pugsley; not British. Var. **occidentalis** Pugsley, described from
 Irish plants.

O. alpestris Pugsley = *O. latifolius* race or subspecies *impudicus*
 A. & G. Not British.

O. sambucina L. with var. *incarnata* Lam. Not British.

- 669/18. **HIMANTOGLOSSUM HIRCINUM** Koch. The behaviour of this
 species in cultivation at Stevenage (Herts) since 1931 is de-
 scribed by Wooster (1935).
676. **IRIS** L. The floral nectaries (and their anatomy of) many species
 are described in detail and their systematic importance discussed
 by Daumann (1935). *I. foetidissima*, p. 565 (figs.); (*I. spuria*,
 p. 575); *I. pseudacorus*, p. 576 (figs.).
- 680/1. **SISYRINCHIUM ANGUSTIFOLIUM** Mill. Is recorded, as new, for
 the High Tatra by Györfly (1934 A). It has been found in Hun-
 gary (Com. Marmaros, 1917) and Croatia (Com. Zagreb, 1915) and
 Hayek recorded it for Galicia in 1916; it has been recorded also
 as an escape in Bohemia, Moravia, Lower Austria and the Tyrol.
 Possibly introduced on boots of foresters, or by birds (Degen
 in lit.).
684. **NARCISSUS** L. A study of the number and morphology of the
 chromosomes in certain species, including several of those in-
 cluded in British lists.—Fernandes (1934).
- 689/1. **RUSCUS ACULEATUS** L. The development of the assimilating
 organs is described and figured by Wenck (1935: 13).
- 702/6. **ALLIUM URSINUM** L. This species has been specially studied by
 Schmucker and Drude (1934) from the point of view of laws of
 plant distribution. Vegetative increase (diagram, p. 550) is
 slight, seed production prolific, yet the plant is not present every-
 where in the area wherever the author would expect it, but is
 restricted to the flat high lying plains, and almost exclusively to
 "Muschelkalk," while even there it may be absent. Dispersal to a
 considerable distance appears to be important, and the ecological
 (especially edaphic) peculiarities of the area need investigation.
 Such prolific seed production ("almost confined to annuals and
 biennials") is [thought by the author to be, but cf. *Endymion*,

Juncus, *Orchis*, etc., A.J.W.] unusual in a perennial, in which reproduction by seed "probably plays a much lesser part than is usually thought." [It is probably slight in closed associations.—A.J.W.]

706. *SCILLA* L. *Scilla* L. emend. should be added to the list of *nominu conservanda*, the type-species having been transferred to *Urginea*.—Chouard (1934).
- 706/3. *S. NON-SCRIPTA* (L.) H. & L. There are "strong taxonomic reasons for conserving and extending" the genus *Endymion*.—Chouard (1934).

The normal flower has one bracteole which may be placed on either side of the bract. Plants were found near Paignton, S. Devon, bearing in very small numbers flowers having no bracteoles and flowers having two bracteoles. Plants were also found bearing supernumerary bracts. Under unusual conditions vegetative features may occur in the region of the flowers, resulting in the formation of additional foliar organs on the spiral of growth and a disturbance in that part of the flower where the spiral impinges.—Burkill (1935).

- 706/3d. *SCILLA* (vel *ENDYMION*) *NON-SCRIPTA*, var. **longipedicellata** (Senay) comb. nov. (A. J. Wilmott). Senay (1935) describes Kent specimens in the ecological herbarium at Kew (as *E. nutans* var.), which have excessive elongation of most of the bracts, and elongated pedicels towards the base of the inflorescence.
- 716/1. *PARIS QUADRIFOLIA* L. Cytology.—The asiatic var. *obovata* has $n = 5$, the five chromosomes being easily distinguishable from each other: diploid and triploid forms found.—Haga (1934: 247).
- 724/1. *ACORUS CALAMUS* L. Further evidence of the fruiting of this species in North America is given by Buell (1935 A), who finds no reason for doubting its indigeneity. The species is sterile in Europe, but fruits freely in Minnesota where it is probably native. The seed and seedling are described and figured by Buell (1935 B).
727. *LEMNA* L. Interaction of external factors on the rate of growth is analysed by Hicks (1934) and Ashby and Oxley (1935).

Whether flowering in this genus is as rare as supposed, and possible conditions affecting flowering, are discussed by Joukovsky (1935), who observed mass flowering of *L. minor* and *L. trisulca* near Jaroslavl, and describes and figures them. Numerous specimens of morphological interest were found, in all of which a peculiar swelling occurred between the root and the lamina bearing minute scales, which, increasing in size, topped itself with "a flat plate of a normal stem." [There is no figure, but the author considers this the first evidence of a definite stem with metamorphosed leaves (scales) found in the genus].

- 727/1. *L. MINOR* L. This species flowered in Cheshire in August 1934. Flowering fronds were plentiful in a shallow ditch where the water was fully exposed to the sun. Pollination results from the

- juxtaposition of free-floating flowering fronds rather than from crawling insects or wind.—Green, Mörch and Travis (1935).
- ALISMATACEAE. The ribbon-leaves of *Sagittaria*, *Alisma*, *Elisma*, and *Damasonium*, although externally uniform, show anatomically a differentiation into petiole and lamina.—Meyer (1935).
- 736/1. SCHEUCHZERIA PALUSTRIS L. Embryology and endosperm development detailed (good figures) by Stenar (1935) in relation to phylogeny.
737. POTAMOGETON L. Boros (1934) discusses the Hungarian distribution of the following species: *Potamogeton coloratus*, *P. fluitans*, *P. helveticus*, var. *balatonicus*, *P. pectinatus*, and *P. filiformis*.
- 740/1. ZOSTERA MARINA L. This species largely disappeared from the American Atlantic coast in 1893 and 1894, returning to normal abundance after some years. Other cases of temporary local scarcity are known. At present some areas show improvement but others do not (Cottam, 1934). "Probably no period of eelgrass scarcity (in U.S.A.) can be compared in intensity, duration, and completeness with the present catastrophe."—Cottam (1935: 270; and see 1934). Further evidence is discussed; extreme cold may produce scarcity. Condition in U.S.A. is still unsatisfactory generally, but a few localised areas are fast approaching normality.
- 746/8. SCIRPUS PAUCIFLORUS Lightf. The Eastern American plants of this species are found to differ from the typical Scotch form, having softer caudices, narrower spikelets 4-6 mm. (not 5-8 mm.) long, averaging 5 (not 6) flowers, narrower (not equilateral) duller achene, and bristle teeth weak and irregular. They are named *Eleocharis pauciflora*, var. *Fernaldii*, by Svenson (1934: 380, Plate 321): Distribution map on p. 384.
- 746/9. S. PARVULUS R. & S. Map of distribution in United States by Svenson (1934: 387).
- 753/27. CAREX HUMILIS Leyss. Detailed map of distribution in Moravia by Suza (1935: 473).
- 753/29. C. ERICETORUM Poll. Map of distribution in Moravia by Suza (1935: 477).
- 753/41. C. ATRATA L. Leaf anatomy of series *atratae* in Japan (Japanese key, p. 547, includes *C. Buxbrunii*): *C. atrata* peculiar in having no spine cells in the margin.—Akiyama (1935: 551).
- 753/50. C. TRINERVIS Dégl. In recording this species for the island of Sylt (W. coast Slesvig), Bornmuller (1935) gives much information concerning its distribution. It is a maritime dune plant almost exclusively of the Atlantic coast region from Portugal, France, Belgium, Holland, Frisian Is., Denmark, and sporadically along the Baltic to Finland.
- 753/54. C. LAGOPINA Wahl. Leaf anatomy figured by Akiyama (1934: 254); Japanese material.

- 753/58. *C. CANESCENS* L. Leaf anatomy figured by Akiyama (1934: 253); Japanese material.
- 753/68. *C. DIVISA* Huds. A thriving colony was discovered in Maryland (Chesapeake Bay) by Blake (1934: 412), the first record for America [presumably introduced, as *Teesdalia nudicaulis*—a ballast alien—was recorded from the same point].

GRAMINEAE. Several changes in classification are suggested by Prat (1934) from a study of epidermal tissues. *Nardus* becomes a new subtribe of *Chlorideae*, *Beckmannia* is transferred to *Festuceae*. The genus *Spartina* contains at least five subdivisions.

The ligule consists of (a) the free upper border of the sheath, which is usually split, and (b) a median upgrowth of the leaf epidermis. Either or both of these parts may be absent, but if (b) is absent the grass is considered eligulate. In the studies of transition structures between lemma and normal leaf (Philipson, 1934) both these parts may be evident, and (b) "may form a scale which is free from the lateral lobes, which then appear as lobes of the sheath," i.e., (a).—Philipson (1935 B).

Study of proliferating spikelets of *Dactylis glomerata* and *Deschampsia caespitosa* show that the leaves of such spikelets are equivalent to the lemmas, the lateral teeth of the latter being ligular.—Philipson (1934).

758. *SPARTINA* Schreb. Chevalier, A. (1934) discusses the species of this genus and doubts the hybrid origin of *S. Townsendii* Groves because it possesses characters not in either supposed parent. [But Huskins has shown that *S. alterniflora* has chromosomes $2n = 70$, *S. stricta* $2n = 56$, *S. Townsendii* $2n = 126$, which confirms the supposition of hybrid origin.] *S. stricta* (Aiton, 1789) Roth 1806 is called *S. maritima* (Curtis, 1758) Fernald 1916 [but the latter is invalidated by *S. maritima* Walter 1788]. Three forms of *S. glabra* Muhl. (*S. maritima* Fernald, subsp. *glabra* (Muhl.) Yves) are differentiated, but not recorded for this side of the Atlantic. *S. Neyrautii* is treated as being luxuriant *S. alterniflora* L.

- 758/3. *S. TOWNSENDII* H. & J. Groves has been planted in six Irish counties and is making good progress.—Praeger (1935).

The extension of the range of this species at the mouth of the Seine is detailed (with maps) by Senay (1934). Its characters are discussed, also its origin and method of dissemination (by shipping).

Details of the planting out of this species in Denmark (1931 and 1932) are given by Jørgensen (1934, with map and photographs). It appears to be doing well.

The germination has been investigated by Nelson and Munro (1934) with a view to discovering the best methods of storage for preserving the viability of the seed for its practical use in coastal reclamation work. Dry storage appears to be preferable.

777. **PHELEUM L.** A full bibliography of taxonomic and agricultural work on this genus is given by Hall, M. (1935).
780. **AGROSTIS L.** There are four kinds of abnormality of the spikelet.
1. "*A. sylvatica* Huds." is a state of *A. canina* L. due to infection by a nematode worm, *Anguillina agrostis*. *A. stolonifera* and *A. tenuis* are also attacked and the effects of infection are enlargement of the glumes, lengthening of the lemma with increase in the number of nerves, and development of the ovary into a spindle-shaped purple gall. The result is a quasi-viviparous state not to be confused with
 2. True "vivipary" or proliferation. This occurred in two culms of a plant of *A. stolonifera*, var. *maritima*, transplanted from Tynemouth to Kew.
 3. Infection by a fungus, *Tilletia decipiens*. This, when *A. tenuis* is attacked, results in "*A. pumila* L." of low habit and with numerous erect culms. There are also, however, dwarf forms of *A. tenuis* of natural origin. The fungus is also found on *A. stolonifera* and *A. canina*.
 4. Two-flowered spikelets. This is of extreme rarity in *Agrostis* and has been noted in *A. setacea*, *A. tenuis* and a specimen in Herb. Mus. Brit., which may be *A. canina* × *tenuis*.—Philipson (1935 A).
- 791/4. **DESCHAMPSIA FLEXUOSA (L.) Trin.** Germination factors: after-ripening is important (was incomplete in 5 months, complete 14-15 months); if un-after-ripened (a) darkness and (b) 30° C. are unfavourable, but after-ripened seed is less sensitive to external conditions.—Nelson and MacLagan (1935).
- 813/1. **MOLINIA CAERULEA (L.) Mch.** The panicle is poisonous before and during flowering, owing to the presence of a cyanogenetic complex which disappears after flowering.—Jullet and Zitti (1935).
824. **POA L.** Chromosomes of *P. palustris* L. (*P. serotina* Ehrh.), 2n = 28 (Avdulov, 1928), 42 (Stählin, 1929), 28 (three sources: tetraploid) and 21 (one source: triploid), Kiellander (1935), i.e., basic number 7 as in most other grasses.
- 824/11b. **P. ALPINA**, var. **ACUTIFOLIA** Druce, is identified by Nannfeldt (1935 B: 35) as *P. jemtlandica* (Almq.) Richt., which is a hybrid between *P. alpina* L. and *P. flexuosa* Sm.
- 824/12b. **P. [LAXA Hanke]**, var. **SCOTICA** Druce. This is shown by Nannfeldt (1935 B) to be a species distinct from *P. laxa*, the correct name for which is *P. flexuosa* Sm. (type locality, Ben Nevis). A full list of known localities is given (p. 95-) in Sweden, Norway, Iceland and Scotland. The Scottish are Inverness: Ben Nevis; Cairntoul; Aberdeen: Lochnagar; [Forfar: Caenlochan ?, specimens not seen]. The species is partial to bare mountain summits. [I have twice searched for it without success at the summit of Ben Nevis, but it should be sought by climbers of the precipices

- and spouts: A. J. W.]. It is readily distinguishable from *P. glauca* forms by the extremely short anthers (c. 0.6-1.0 mm. long). It is regarded by the author as a relict survivor of the glacial period.
- 824/14b. *P. SUPINA* Schrad. is held by Nannfeldt (1935 A; very well illustrated) to be a distinct species from *P. annua*. It does not appear to be rare in Sweden (from Schonen to Jemtland) and is now recorded from Latvia and Siberia. The most certain and convenient character to separate it from *P. annua* is the length of the stamens, about double as long as in *P. annua*. Sterile hybrids between the two species have been seen.
- 826/9. *FESTUCA OVINA* L. Fernald (1935: 250) gives a key to the eastern American allies of this group, the characters of the British plants concerned being:—
- (a) Awns 1.3-3 mm. long.
- F. ovina* L. Culms 1.5-3 (-6) dm. high.; leaves .4-6 mm. diam., 5-7 nerved; panicles 2-5 cm. long; spikelets 5-7 mm. long, 3-6 flowered; second glume 2.5-4 mm. long; lowest lemma 4.5-6 mm. long.
- F. ovina*, var. *duriuscula* (L.) Koch. Culms to 7 dm.; leaves .7-1.2 mm. broad, 7-9 nerved; panicles 4-10 cm.; spikelets 7-10 mm., 4-9 flowered; second glume 3.5-5 mm. long; lowest lemma 4.5-6 mm. long.
- (b) Awnless or awns at most 0.6 mm. long.
- F. vivipara* L. Florets modified into leafy proliferous shoots; second glume 3-5 mm. long; lemmas membranaceous, not strongly inrolled, 4-6 mm. long; stamens wanting.
- F. capillata* Lam. Florets normal; second glume 2-2.7 mm. long; lemmas coriaceous, lightly inrolled, 3-3.5 mm. long; anthers 1.5-2 mm. long.
- 826/18. *F. MYURUS* L. "*Vulpia Myurus* (L.) Gmel., forma *hirsuta* Hack.," originally described from Portugal, is recorded for Spain, France, Switzerland, Bulgaria, Czechoslovakia, Germany and Sweden. With it is identified *Festuca megalura* Nutt. from North America. The form *hirsuta* is distinguished from typical *V. Myurus*, with which it has sometimes been found growing, by the lemmata being ciliate in the upper part. Intermediates have been observed. The form should be looked for in the British Isles.—Blom (1934 A).
827. *BROMUS* L. The measurements of various parts of *B. rigidus*, *B. Gussonii* and *B. sterilis*, taken from large numbers of individuals, are analysed, with support to the view that *B. Gussonii* is a hybrid of the other two species.—de Cugnac (1934).
- 827/19(2). *BROMUS LEPIDUS* Holmberg. Wein (1935: 91) tabulates the characters distinguishing this from *B. mollis*, and indicates that it was probably known to Ray, Tournefort and Scheuchzer. The distribution in Germany is discussed.

- The species seems nearly always to occur in fields sown with *Lolium italicum* and is presumably introduced with the seed.—Tutin (1935).
828. BRACHYPODIUM Beauv. A critical account of four species from Europe and the Mediterranean region is given by Saint-Yves (1934).
- The flowering and seeding habits of the two British species are detailed by Beddows (1935). *B. pinnatum* is shown to be normally cross-fertilised, with possible slight self-fertilisation. The various anther colours are constant on each plant. *B. silvaticum* has canary yellow anthers 3.5-4.5 mm. long, and self-fertilisation by autogamy and geitonogamy is possible, although in the open cross-fertilisation might also occur.
829. LOLIUM L. Hybrids between *L. perenne* × *L. temulentum* have been established by Jenkin (1935), the percentage of seed setting being relatively high, but that of germination and plant establishment good only if *L. perenne* was the female parent, although the reciprocal hybrids are similar; they are functionally male sterile but can be used as female with either parent as male. Smooth stem, relatively short glume, and awlessness (all characters of *L. perenne*) are dominants, and the behaviour of other characters is described.
- 830/1×2. AGROPYRUM ACUTUM. Its probable hybrid origin is confirmed by Simonet (1935), who shows that while in *A. junceum* $2n = 28$ and in *A. pungens* $2n = 42$, in *A. acutum* $2n = 35$. The characters (tabulated) are intermediate or show dominance of one or other parent. The pollen is empty, and there are small grains indicative of cytological aberrations (pentaploidy). Its distribution in France is given.
- 830/2b. A. LITORALE Host. Wein (1935: 97) tabulates the characters separating this species from *A. repens*. In the single Thuringian locality sterile ± intermediate hybrids with *A. repens* occur.
839. JUNIPERUS L. The two native species have been confused. In Ireland *J. communis* is not always erect but sometimes prostrate like *J. sibirica*.—Praeger (1935).
841. PINUS L. For a long study of the tracheids (diagrammatically illustrated) see Lewis, F. T. (1935). (*Pinus silvestris* is mentioned but the work appears to have been mainly done on *P. Strobus*).
844. EQUISETUM L. The intermittent or sporadic occurrence in most species of short internodes, flexuous stems, dichotomous or twin shoots, spiral sheaths, and semisterile and completely sterile cones, is considered to be the expression of physiological states rather than of genetical conditions.—Schaffner, J. H. (1934).
- 845/1. CRYPTOGRAMMA ORISPA (L.) R. Br. Fernald (1935: 238, distribution map 245) discusses at length the differences between this, the North American *C. acrostichoides* Hooker, and the Himalayan *C. Brunoniana* Wallich, treating them as three varieties of *C.*

- crispa* (key, p. 244), of which our plant is var. *typica*.—Fernald (p. 245).
- 847/1. *EUPTERIS AQUILINA* (L.) Newm. This can grow (in France) on calcareous clays where decalcification of the surface assists, provided that the subsoil, whether permeable or impermeable, maintains the constant humidity needed by a plant with extremely rapid growth.—Gardet (1934). Stomata: see Smith (1935: 456).
- 850/1. *PHYLLITIS SCOLOPENDRIUM* (L.) Newm. Occurs as rare relic from pre-glacial times, in unglaciated parts of North America.—Fernald (1935: 199, 201; distribution map, p. 200).
- 854/4. *POLYSTICHUM LONCHITIS* (L.) Roth. Occurs as pre-glacial relic in unglaciated eastern N. America.—Fernald (1935: 199; distribution map, p. 207).
- 857/4. *CYSTOPTERIS FRAGILIS* (L.) Bernh. The North American varieties are described by Weatherby (1935: key p. 375).
- 866/1. *OPHIOGLOSSUM VULGATUM* L. Incomplete nuclear division in the formation of the tapetum is described by Steil (1935).
870. *LYCOPIDIUM* L. The spores of the British species are very distinct, and are figured by Wilson (1934: plates 275-277). Those of some species require special treatment (see p. 14) before the appearance of the characteristic papillation can be seen. *L. alpinum* is not constantly distinguishable from *L. complanatum* by spore characters.
- 871/1. *SELAGINELLA SELAGINOIDES* (L.) Link. Leaf epidermis figured by Satake (1934: 270 (English summary, p. 277)). Microspores and megaspores are critically described and figured by Reeve (1935: 343; plates 380, 381).
- CHARACEAE. Records from Uruguay of 11 Charophyta, compiled from notes left by the late James Groves. Several of them are British species.—Allen, G. O., and Herter, W. G. (1934).
872. *NITELLA* Ag. The primary divisions of the genus adopted by H. Braun, *Monarthrodactylae*, *Diarthrodactylae*, and *Polyarthrodactylae*, were based on the number of cells of the branchlets and involve the inclusion of anomalous species in the same division. The present paper proposes as a more natural arrangement the division of the genus into two main primary divisions—(1) *Homoeoclemae*, species having all the branchlets in a whorl in a single circle and \pm equal, and (2) *Heteroclemae*, species having them in more than one circle and of two distinct kinds.—Groves and Allen (1935).

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Abbreviations of Titles of Periodicals.

- AHB.Univ.Latv.=Acta Horti Botanici Universitatis Latviensis.
 AHB.Univ.Tart.=Acta Instituti et Horti Botanici Tartuensis (Dorpatensis).

- Amer.JB.=American Journal of Botany.
 Ann.Bot.=Annals of Botany.
 Archiv.Bot.=Archivio Botanico.
 ASB.Polon.=Acta Societatis Botanicorum Poloniae.
 BBC.=Beihefte zum botanischen Centralblatt.
 BM.Tokyo=The Botanical Magazine, Tokyo.
 Bot.Archiv.=Botanisches Archiv.
 Bot.Gaz.=The Botanical Gazette.
 Bot.Közlem.=Botanikai Közlemények.
 Bot.Not.=Botaniska Notiser (Lund).
 Bot.Tidskr.=Botanisk Tidsskrift (København).
 BSB.Bulg.=Bulletin de la Société botanique de Bulgarie.
 BSB.Fr.=Bulletin de la Société botanique de France.
 BSB.Genève=Bulletin de la Société botanique de Genève.
 BS.Broter.=Boletim da Sociedade Broteriana.
 BSRB.Belg.=Bulletin de la Société royale de Botanique de Belgique.
 B.Torrey BC.=Bulletin of the Torrey Botanical Club.
 Contr.LBU.Montreal=Contributions du Laboratoire de Botanique de l'Université de Montreal.
 Dansk BA.=Dansk botanisk Arkiv.
 Engl.BJ.=Botanische Jahrbücher . . . begründet von A. Engler.
 Fedde Rep.=Repertorium specierum novarum regni vegetabilis. Herausgeber . . . Dr Friedrich Fedde.
 Gard.Chron.=The Gardeners' Chronicle.
 Jap.JB.=Japanese Journal of Botany.
 J.Arnold Arbor.=Journal of the Arnold Arboretum.
 J.B.=The Journal of Botany.
 J.Ecol.=Journal of Ecology.
 J.Gen.=Journal of Genetics.
 JLS.=The Journal of the Linnean Society of London.
 J.Wash.Acad.Sci.=Journal of the Washington Academy of Sciences.
 Kew Bull.=Bulletin of Miscellaneous Information, Kew.
 Le Bot.=Le Botaniste.
 L.Western Bot.=Leaflets of Western Botany.
 Magy.BL.=Magyar botanikai Lapok.
 M.Göteborg.BT.=Meddelanden från Göteborgs botaniska Trädgård (Acta Horti Gotoburgensis).
 Mitt.Thür.BV.=Mittheilungen des Thüringischen botanischen Vereins.
 New Phyt.=The New Phytologist.
 NGB.Ital.=Nuovo Giornale botanico Italiano.
 NW.Nat.=The North Western Naturalist.
 Notes RBG.Edinb.=Notes from the Royal Botanic Garden, Edinburgh.
 OBZ.=Österreichische botanische Zeitschrift.
 PLS.=Proceedings of the Linnean Society of London.
 PRS.Lond.=Proceedings of the Royal Society of London.
 Rev.Sudamer.Bot.=Revista Sudamericana de Botánica.
 RG.Bot.=Revue générale de Botanique.
 Svensk BT.=Svensk botanisk Tidsskrift.

VBV.Brandenb.=Verhandlungen des botanischen Vereins der Provinz Brandenburg.

Zeits.Bot.=Zeitschrift für Botanik.

Zeits.Vererb.=Zeitschrift für induktive Abstammungs-und Vererbungslehre.

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