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THIRD
ANNUAL REPORT,

AND

PROCEEDINGS,

OF

The Botanical Society.

SESSION 1838-9.



EDINBURGH:

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Corrected to 31st October 1839.

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Mem. C.P.S., Botanic Garden, Calcutta. (4)

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1839.
Jan. 10. His Majesty FREDERICK AUGUSTUS, KING OF SAXONY.
Apr. 11. His Majesty FREDERICK WILLIAM III., KING OF PRUSSIA.
1837.
Feb. 9. CHARLES ADOLPHE AGARDH, F.L.S., Member of the Royal
Academy of Sciences, Stockholm, and Bishop of Carlstadt.
L. B. FREDERICK MARSCHALL VON BIEBERSTEIN, Ordinary
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Geneva.
BENJAMIN BARON DE LESSERT, F.L.S., Member of the Insti-
tute of France, Paris.
FREDERICK ERNEST LUDOVIC DE FISCHER, M.D., F.L.S.,
Director of the Imperial Botanic Garden, St Petersburg.

1837.
Feb. 9. ELIAS FRIES, M.D., F.L.S., Member of the Royal Academy of Sciences, Stockholm, and Professor of Political Economy, Upsal.
JANUS WILKEN HORNEMANN, F.L.S., Professor of Botany, Copenhagen.
ALEXANDER BARON DE HUMBOLDT, F.R.S., F.L.S., Member of the Institute of France, and of the Royal Academy of Sciences, Berlin.
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C. F. BRISSEAU MIRBEL, F.L.S., Member of the Institute of France, and Professor of Agriculture at the Sorbonne, Paris.
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LUDOVIC CHRISTIAN TREVIRANUS, M.D., F.L.S., Professor of Botany, Bonn.
Dec. 14. LE CHEVALIER GIOVANNI GUSSONE, Naples.
1838.
Dec. 13. ADRIAN DE JUSSIEU, F.L.S., Member of the Institute of France, Professor of Botany, Paris. (23)

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Director of the Royal Botanic Garden,
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Original
Members.

Places of Birth.

1836.

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Admitted.

1836.

- April 14. GEORGE ANNE MARTIN, M.D., Ventnor, Isle of Wight.
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JAMES WARD, Esq., Richmond, Yorkshire.
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- Nov. 10. ROBERT BALL, Esq., M.R.I.A., Sec. Zoological Soc., Dublin.
Rev. GEORGE GORDON, Minister of Birnie, Morayshire.
EDWIN LEES, Esq., F.L.S., Worcester.
DANIEL CHAMBERS MACREIGHT, M.D., F.L.S., London.
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WILLIAM THOMPSON, Esq., Vice-President of the Belfast
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HEWETT COTTRELL WATSON, Esq., F.L.S., Thames-Ditton,
Surry.
- Dec. 8. THOMAS COULTER, M.D., M.R.I.A., Dublin.

Admitted.

1836.

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SIMON FOOT, Esq., M.R.I.A., and one of the Botanical Committee of the Royal Dublin Society, Dublin.
GEORGE STEPHENS GOUGH, Esq., M.R.I.A., Dublin.
Rev. THOMAS DIX HINCKS, LL.D., Corresponding Secretary of the Belfast Botanical Society.
JAMES TOWNSEND MACKAY, Esq., M.R.I.A., A.L.S., Dublin.
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29. GEORGE CHARLES WALLICH, M.D., Calcutta. (Res. Fellow, 1837. March 17. 1836.)
- Jan. 12. WILLIAM ALLMAN, M.D., Professor of Botany, Trinity College, Dublin.
HARRY BABER, Esq., B.A., Trinity College, Cambridge.
FREDERICK JOHN FARRE, M.D., F.L.S., Lecturer on Botany at St Bartholomew's Hospital, London.
Rev. JOHN STEVENS HENSLOW, M.A., F.L.S., Sec. C.P.S., Regius Professor of Botany, Cambridge.
EDWIN JOHN QUEKETT, Esq., F.L.S., Lecturer on Botany at the London Hospital, and at the Aldersgate Street School, London.
CHARLES ABBOT STEVENS, Esq., B.A., Trinity College, Cambridge, Rochester, Kent.
- Feb. 9. JOHN FORBES ROYLE, M.D., V.P.R.S., Sec. G.S., Professor of Materia Medica, King's College, London.
- March 9. GEORGE JASPER LYON, Esq., Glasgow.
JAMES STUART MENTEATH, Esq., Closeburn, Dumfriesshire.
GEORGE AUGUSTUS FREDERICK WILKS, M.D., Lecturer on Botany, London.
- April 13. WILLIAM B. CARPENTER, M.D., M.R.C.S.L., Bristol. (Res. Fellow, June 9. 1836.)
- May 11. JAMES SCOTT BOWERBANK, Esq., F.G.S., London.
ALFRED WHITE, Esq., F.L.S., F.G.S., London.
- June 8. JOHN BALL, Esq., 85 Stephen's Green, Dublin.
- July 13. JOHN EDWARD GRAY, Esq., F.R.S., F.G.S., F.Z.S., Pres. Bot. Soc. Lond., British Museum, London.
- Nov. 9. C. E. BROOME, Esq., Rudloe, near Chippenham, Wilts.
SAMUEL HOLKER HASLAM, Esq., F.L.S., 4 Grosvenor Place, Bath.
JOHN SHEER, Esq., Lecturer on Chemistry, Aberdeen.
- Dec. 14. ROBERT HIBBERT TAYLOR, Esq., Liverpool.

Admitted.

1838.

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GEORGE LUXFORD, Esq., A.L.S., Ratcliffe Highway, St George's East, London.
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16. THOMAS BELL SALTER, M.D., F.L.S., Ryde, Isle of Wight. (Res. Fellow, May 12. 1836.)
GILBERT M'NAB, M.D., St Mary's, Jamaica. (Res. Fellow, March 17. 1836.)
- Feb. 8. ROBERT MAULKIN LINGWOOD, Esq., F.L.S., B.A. Christ's College, Cambridge, Sufton Court, near Hereford.
10. HENRY REED MELVILLE, M.D., St Vincent. (Res. Fellow, April 13. 1837.)
- April 12. GEORGE EDGAR DENNES, Esq., F.L.S., Sec. Bot. Soc. Lond., 5 Vine Street, Golden Square, London.
GEORGE DICKIE, Esq., Lecturer on Botany, Aberdeen.
JOHN GEORGE INNES, Esq., Forres.
- May 10. Rev. WILLIAM HINCKS, F.L.S., 20 Torrington Sq., London.
- June 14. ANDREW FLEMING, Esq., A.M., King's College, Aberdeen.
- July 12. JONATHAN HAIGH BRANFOOT, M.D., Durham (Res. Fellow, Jan. 12. 1837.)
- Nov. 8. JOSEPH DICKINSON, M.D., 24 Great George Square, Liverpool.
WILLIAM GOURLIE jun. Esq., 8 South Frederick St., Glasgow.
Rev. KENYON HOMFRAY, Monmouth.
GODFREY HOWITT, M.D., Nottingham.
- Dec. 13. DUNBAR, JAMES, EARL OF SELKIRK, St Mary's Isle, Kirkcudbright.
JAMES MACFADYEN, M.D., F.L.S., Kingston, Jamaica.
THOMAS WHITE MANN, Esq., Bowman's Lodge, Upper Holloway, London.
SPENCER THOMSON, Esq., Burton-on-Trent, Staffordshire. (Res. Fellow, June 9. 1836.)
- 1839.
- Jan. 10. JOHN REILLY, Esq., F.G.S., Flood Street, Galway, Member of the Royal Galway Institution.
JOHN WYNNE, Esq. of Haslewood, Sligo, Member of the Geological Society of Ireland.
- Feb. 14. ALBERT JOHN HAMBROUGH, Esq., Steephill Castle, Isle of Wight.
RICHARD PARNELL, M.D., F.R.S.E., M.W.S., Jamaica. (Res. Fellow, 17th March 1836.)
- Mar. 14. THOMAS J. BOWMAN, Esq., Richmond, Yorkshire.
Lieut. WILLIAM MUNRO, H. M. 39th Regt., Madras.
THOMAS VEITCH, Esq., Exeter, Devonshire.
- May 10. THOMAS SANSOM, Esq., Mem. Bot. Soc. Lond., 2 Cloudesley Street, Islington.
- June 13. WILLIAM ARNOLD BROMFIELD, M.D., F.L.S., Ryde, Isle of Wight.
WALTER CALVERLEY TREVELYAN, Esq., M.A., F.R.S.E., F.G.S., M.W.S., Wallington, near Newcastle-on-Tyne.

IV. LIFE MEMBERS.

1836.
Dec. 8. Mrs KANE, 23 Lower Gloucester Street, Dublin.
1837.
May 11. Mrs MICHAEL PERCIVAL, Edinburgh.
1838.
Mar. 8. The Honourable LOUISA ANNE NEVILLE, Audley End, Essex.
1839.
Feb. 14. The Right Hon. Lady JANE LINDSAY-CARNEGIE, Kinblethmont, Forfarshire.
- Mar. 14. Mrs SCRYMSOURE FOTHRINGHAM, Fotheringham House, Forfarshire.
- June 13. Miss ANNA MARIA PLOWDEN, Sawston, near Cambridge.

(6)

V. FOREIGN MEMBERS.

1837.
Feb. 9. P. J. BROWN, Esq., Eichenbuhl, near Thun, Switzerland.
M. GUTHNICK, Berne, Switzerland.
CHARLES FREDERICK MEISNER, M.D., Basle, Switzerland.
- Nov. 9. S. BISCHOFF, Berne, Switzerland.
GEORGE DOLLINER, Vienna.
F. GLOCKER, Berne, Switzerland.
OSWALD HEER, M.D., Professor of Botany, Zurich, Switzerland.
- ALBERT KOLLIKER, Zurich, Switzerland.
FRANÇOIS LAGGER, M.D., Fribourg, Switzerland.
REV. CHRISTIAN MUNCH, Basle, Switzerland.
CHARLES NAEGELI, Zurich, Switzerland.
PHILIP MAXIMILIAN OPITZ, Prague, Bohemia.
L. RABENHORST, Luckau, Prussia.
J. L. SCHALLER, Fribourg, Switzerland.
R. SCHATOW, Berne, Switzerland.
C. SINZ, Zurich, Switzerland.
JOHN BERNH. WILBRAND, Professor at Giessen, Germany.
1838.
Mar. 8. A. FISCHER, Basle, Switzerland.
Rev. LOUIS LERESCHE, St Cierge, sur Moudon, Switzerland.
OTTO WILH. SONDER, Kiel, Holstein, Saxony.
M. LUHLER, Wirtemberg, Germany.
- Apr. 12. ADAMS JEWETT, Mobile, United States.
- June 14. H. JEWETT, M.D., Dayton, Ohio, United States.
LEVI FLETCHER, Mobile, Alabama, United States.
C. T. BEILSCHMIED, Ohlau, near Breslau, Silesia.

1838.

- June 14. AUGUST AEMIL KELLERMAN, late of Dresden,—*Assistant Curator.*
- July 12. GAVIN WATSON, M.D., Philadelphia, United States.
- Nov. 8. CH. MORREN, Member of the Royal Academy of Brussels, and Professor of Botany, Liege, Belgium.
- Dec. 13. FR. ANT. W. MIQUEL, Rotterdam.

1839.

- Jan. 10. C. B. LEHMANN, Berlin.
- Apr. 11. CH. H. GODET, Neuchatel, Switzerland.
Rev. F. C. REHSTEINER, Teuffen, Appenzell, near St Gall, Switzerland.
FERDINAND RUGEL, Basle, Switzerland.
JOHAN. KARL SCHMIDT, M.D., Berne, Switzerland.
- May 10. N. C. SERINGE, Professor of Botany, Lyons, France. (35)

VI. ASSOCIATES.

1836.

- Nov. 10. Mr JAMES CRUICKSHANK, Dumfries.

1838.

- Nov. 8. Rev. A. RUTHERFORD, Kingussie, Inverness-shire.
Mr WILLIAM GARDINER junior, Dundee.
- Dec. 13. Mr ALEXANDER CROALL, Teacher, Hillside, by Montrose.
Mr JOHN HUNNEMAN, A.L.S., London. (Died March 1839.)

1839.

- Jan. 10. Mr ARCHIBALD GORRIE, Annat Garden, Perth. (5)
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Members are requested to intimate to the Secretary any errors or omissions in their designations which have occurred in the preceding List.

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THIRD ANNUAL REPORT,

PREPARED BY THE COMMITTEE OF MANAGEMENT.

The Committee of Management, in submitting their THIRD ANNUAL REPORT, have much pleasure in congratulating the Society on the progress which it has made during the past year. The number of Members has increased in a ratio beyond expectation; many interesting Papers have been communicated; numerous specimens both of British and Foreign plants have been received; several valuable Works have been added to the Library; and important privileges have been obtained through the union which has been recently effected with the University Herbarium. These various points will be more particularly noticed in the subsequent part of this Report, and the Committee merely refer to them now, as affording the most gratifying proofs not only that the prosperity of the Society continues unabated, but that it is rapidly advancing in that career of success and usefulness which has hitherto distinguished its progress. The Committee are aware that this degree of prosperity has been chiefly attained through the zeal, activity, and cordial co-operation of many valuable Members of the Society at home and abroad; and they would impress upon all the importance of contributing, by similar exertions, to the maintenance and increase of that prosperity, in the full assurance that they will thereby mutually benefit each other, and promote the best interests of Botanical Science.

On a former occasion, the Committee were enabled to communicate the gratifying intelligence that Her Majesty the QUEEN had consented to become Patron of the Society. They have now to record with peculiar satisfaction that His Majesty FREDERICK AUGUSTUS, KING OF SAXONY, and His Majesty FREDERICK WILLIAM III., KING OF PRUSSIA, both zealous cultivators of botanical science, have been graciously pleased to become Foreign Honorary Members of the Society.

At the date of last Annual Report, the number of Members amounted to ONE HUNDRED AND NINETY-NINE. Since that period to 31st October 1839, four Members have died, and one has resigned. During the same period, SEVENTY-ONE new Members have been enrolled, and the Society therefore now consists of

British Honorary Members	4
Foreign Honorary Members	23
Resident Fellows	109
Non-Resident Fellows	83
Life Members.....	6
Foreign Members.....	35
Associates	5

Number of Members at 31st October 1839, 265

Specimens were distributed to the following Members and others, contributors to the Society's Herbarium, in the order of priority exhibited below, ascertained in terms of Bye-Law eighth; National Institutions, Universities, and Chartered Societies, forming Herbaria, being entitled to take precedence of the Members.

Highland and Agricultural Society of Scotland.	Dr A. Douglas Maclagan.
	Mr R. Ball.
Materia Medica Herbarium in the University of Edinburgh.	Rev. George Gordon.
10 Dr J. H. Pollexfen.	Dr D. C. Macreight.
Mr Walter Scott.	Mr M. J. F. Sidney.
	Mr W. A. Stables.
5 Mr R. J. Shuttleworth.	Mr H. C. Watson.
Mr W. A. Leighton.	Mr W. F. Lindsay-Carnegie.

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|----|---|----|---|
| 15 | Mr Simon Foot.
Mr H. Baber.
Dr F. Farre.
Professor Henslow.
Mr C. A. Stevens. | 50 | Dr Walker-Arnott.
Dr R. C. Alexander.
Mr A. H. Balfour.
Dr G. A. Martin.
Rev. T. B. Bell. |
| 20 | Mr J. Veronge.
Dr F. I. White.
Mr P. J. Brown.
Professor Meisner.
Mr G. J. Lyon. | 55 | Dr T. Bell Salter.
Mr C. C. Babington.
Mr J. Ward.
Dr W. B. Carpenter.
Rev. W. S. Hore. |
| 25 | Dr H. B. M. Harris.
Mr J. Ball.
Mr C. E. Broome.
Rev. C. H. Münch.
Mr J. T. Syme. | 60 | Rev. W. Hincks.
Mr H. F. C. Cleghorn.
Mr A. Fleming.
Dr Gavin Watson.
Dr J. Dickinson. |
| 30 | Mr E. Young.
Mr G. Luxford.
Dr John Shaw.
Mr R. M. Lingwood.
Hon. Miss Neville. | 65 | Mr W. Gourlie jun.
Dr G. Howitt.
Mr J. E. Currey.
Mr T. Fraser.
Mr J. S. Morrieson. |
| 35 | Mons. A. Fischer.
Rev. Louis Leresche.
Mons. O. W. Sonder.
Mr Geo. Dickie.
Botanical Society of London. | 70 | Mr A. Sibbald.
Mr T. W. Mann.
Mons. F. A. W. Miquel.
Mr P. Cruickshank.
Mr J. Reilly. |
| 40 | Professor Graham.
Dr J. H. Balfour.
Mr R. Maughan.
Mr D. Steuart.
Mr W. Brand. | 75 | Mons. C. B. Lehmann.
Rev. C. F. Rehsteiner.
Mons. F. Rugel.
Dr J. K. Schmidt.
Mr W. Gardiner jun. |
| 45 | Mr E. Forbes.
Mr J. M'Nab.
Dr G. M'Nab.
Dr N. Tyacke.
Mr W. H. Campbell. | 80 | Mr J. Cruickshank.
Mr A. Croall.
Rev. A. Rutherford.
Mr R. Leyland. |
| | | 84 | Dr Roth. |

At the next annual distribution, one-third of the Members from the top of the list will, in terms of the Laws, be placed at the foot of it, and rise by rotation.

It is hoped that the specimens transmitted from the Society will, in most instances, have realized the expectations

of Members. At the same time, the Committee are fully aware that, amongst so large a number, there must necessarily have been some parcels by no means adequate to the contributions received. This may have arisen either from the extent of the latter, or from the plants wanted in return being rare species, which the Society might not at the time be able to supply. The Committee feel anxious that such defects should be remedied, and they have at present under consideration measures which, they trust, will accomplish that purpose. In the mean time, however, where the desiderata of contributors could not be fully supplied, they have endeavoured to give an equivalent, by substituting plants which, from their rarity or other circumstances, they thought might prove acceptable. It will be obvious, that every year will tend to lessen the number of specimens required to fill up blanks in the Society's Herbarium, and thus leave a larger portion of the rarer plants for distribution.

The experience of three years has convinced the Committee, that the period hitherto proposed to be set apart for conducting the annual distribution is much too short, and that the Curator cannot have it satisfactorily accomplished before June or July. It is therefore necessary to state, that, in future, the parcels will not be forwarded till about the middle of July; an arrangement which the Committee have reason to believe will not prove inconvenient to correspondents, as there will be an interval of nearly five months between the date of receiving the Society's parcels, and the period for sending in the following year's contributions.

A list of contributors to the Herbarium, during the past year, will, as usual, be found at the end of the Proceedings, embracing the names of many zealous correspondents in various parts of the world. The number of specimens received, after rejecting a large portion of those which were imperfect or badly preserved, has been estimated by the Curator as follows :—

	Species.	Specimens.
British Phænogamic Plants, about	3,300	31,500
Foreign do. do. about	1,600	7,500
British and Foreign Cryptogamic Plants, about	280	1,200
	<hr/>	<hr/>
Total, about	5,180	40,200

The number of specimens distributed, after a selection was made for the Society's Herbarium, has been computed at about 38,000; viz. of British plants, 30,000; of Foreign plants, 8000.

To all the contributors of specimens, the thanks of the Society are gratefully returned.

The Committee must, however, specially notice another donation from the late Mr William Christy junior, received in June last, consisting of the remainder of his Herbarium, and comprising about 1100 specimens of British and Foreign plants. It may be proper here to record, that the whole contributions to the Herbarium from Mr Christy, now amount to the very large number of 16,000 specimens, and that a great proportion of these were previously desiderata in the Society's Herbarium. Whilst the Committee again feel called upon to express the high sense which they entertain of the value of these donations, and the benefit thereby conferred upon science, they are satisfied that every Member will cordially unite with them in the expression of similar sentiments.

Amongst the other Members who have contributed largely to the Society's Herbarium, the following may be particularly noticed:—Mr H. Baber, Mr C. C. Babington, Dr J. H. Balfour, Rev. T. B. Bell, Mr C. E. Broome, Right Hon. Lady Jane Lindsay-Carnegie, Mr A. Croall, Mr S. H. Haslam, Rev. W. S. Hore, Mr George Luxford, Mr C. A. Stevens, Mr J. T. Syme, Mr James Ward, Mr H. C. Watson.

Whilst some improvement has been observed in the character of the specimens received since the date of last Annual Report, still many of them have fallen very far short of what the Society could render available, either for their own

Herbarium or for the purpose of distribution. The attention of Members is therefore again requested to the necessity of a better selection and preservation of their specimens, whether intended for their own Herbaria or for duplicates; and the Committee are again under the necessity of reminding contributors, that bad or imperfect specimens cannot be reckoned, at the annual distribution, in determining the number to be allowed them in return for their contributions. They are particularly referred to a paper by Dr Greville, entitled "Directions for collecting Botanical Specimens, and preserving them for the Herbarium," which has been embodied in the Society's Proceedings in the present Annual Report, on account of the many valuable rules and suggestions which it contains; and though a difference of opinion exists amongst the Members respecting some of his views, it will doubtless be regarded with the attention due to any thing which emanates from so high an authority. This paper, and also the important contribution by Professor Christison, published in the Society's Proceedings for 1837-8, containing directions for the preservation of Botanical Specimens in the moist state, have been printed in a separate form for the use of Members and others.*

Specimens considered new to the British Flora, or not included in the Society's Catalogue, have been received in the course of the year, under the following names, from Mr C. C. Babington of Cambridge, to whom the warmest thanks of the Society are due.

Allium sibiricum, Willd. Tintagel, Cornwall. July 1839.

Callitriche platycarpa, Kutz. Halden Hill, Devonshire. July 1839.

Cardamine dentata, Schult. Cherry Hinton, Cambridgeshire. May 1839.

Cardamine sylvatica, Link. Needwood Forest, Staffordshire. Sept. 1839.

* Directions for Collecting and Preserving Botanical Specimens. Edinburgh, Maclachlan, Stewart & Co., and Carfrae & Son; William Pamplin junior, 9 Queen Street, Soho, London; Hodges and Smith, Dublin; Andrew Lottimer, Glasgow.

- Glyceria Borreri*, Bab. Coast of Sussex. 1838.
Herniaria ciliata, Bab. Lizard, Cornwall. July 1839.
Hypericum linearifolium, Vahl. Cape Cornwall. July 1839. The specimens formerly received were from Jersey.
Myriophyllum alterniflorum, DC. Guernsey. July 1838.
Oxalis stricta, Linn. Penzance, Cornwall. July 1839.
Polygonum mite, Pers. Cambridge. October 1839.
Senecio erraticus, Bert. Camelford, Cornwall. July 1839.
Sinapis Cheiranthus, Koch. Swansea, Glamorgan. August 1839.
Trifolium Bocconi, Sav. Cagewith, Lizard, Cornwall. July 1839.

Only one manuscript Catalogue, indicating the plants of a particular district, has been received, viz. :

“Plantarum Phanerogamicarum Species, quæ in Agro Monacensi (Bavar.) occurrunt.” Presented by Dr Roth of Munich.

Several recently published local Floras and Catalogues, of much value and interest, will be found in the list of Donations to the Library.

The Committee, as on former occasions, would call the attention of Members to the utility of such Catalogues, in providing information for a more correct and extended view of the geographical distribution of species, materials for which the Society are most anxious to obtain. They have therefore to request, that Members, who may have it in their power, will be so obliging as to give effect, in this particular, to the wishes of the Society, and favour them with as accurate lists of the plants in their respective neighbourhoods, as their leisure will enable them to obtain.

Second editions of the Society's “Catalogue of British Plants,” and of Mr Leighton's “Catalogue of the Cellulares or Flowerless Plants of Great Britain,” are in course of preparation, and will be published for the use of the Members and others as early as possible. The Secretaries will gladly receive notices of any new plants to be added, errors to be corrected, or improvements to be made, which may be communicated to them.

It was announced in the last Annual Report, that arrangements were in progress for effecting a union between the Society's Herbarium and that belonging to the University. The Committee rejoice to state that this has now been accomplished, and the terms of union (which are stated in the Act of Council, No. II. of the Appendix), will, it is hoped, conduce both to the permanency of the Society, and to the public advantage.

Immediately on this transaction being concluded, the large mass of plants, which had for a series of years been accumulating in the College apartments, was handed over to the Society, and the Curator lost no time in reducing it to order. A Report (which will be found in Appendix, No. III.), was thereafter drawn up, and presented to the Senatus and Patrons of the University, in which the extent and condition of both collections, at the period of their union, is fully described. It will be seen from this Report, that the united Herbarium comprises above *twenty thousand species* of Phænogamous plants, received from almost every quarter of the globe, and also a small but valuable collection of Cryptogamic species, which, it is hoped, may soon be greatly enlarged. The number of *specimens* in the Herbarium will probably amount to upwards of *sixty thousand*. But, besides the specimens appropriated for the Society's own Herbarium, there are many duplicates of almost all the species, which will enable the Society to contribute largely towards the formation of Herbaria elsewhere.

Notice was taken in last Report, of a scheme proposed by Mr Brand for arranging the Society's British Herbarium, and for framing a catalogue of it on principles calculated both to diminish the Curator's labour, and to facilitate all inquiries of a scientific nature, which may be based on the collection in its completed state. Mr Brand has since extended his views to the arrangement of the Society's general collections, and has framed tables for that purpose, which, with some

modifications, may be applied to the arrangement of all Natural History collections, and which, when carried into operation, will, it is expected, lead to the most useful and interesting results. A general outline of these schemes was submitted to the last meeting of the British Association, and a sum was voted by that body for engraving skeleton maps, in order to promote the object in view, as connected with the geographical distribution both of plants and animals. It is unnecessary here to enter fully into detail respecting the schemes alluded to, as it is intended, when they shall have been more fully matured, to send them in proof, for the revision of those who are conversant with the subject, and ultimately to circulate them among Members and others,—in the hope that they may conduce to a more systematic and uniform mode than has hitherto prevailed, of arranging collections, and of recording all particulars relating to them. It is almost needless to observe, how greatly this would tend to facilitate the interchange of communication among naturalists, as well as to extend their views with respect to the productions of any country, or even of the globe itself.

As connected in some degree with this subject, the Committee may notice a paper by Mr Brand (inserted in the Proceedings), on the Statistics of British Botany, particularly as regards the comparative frequency or relative distribution of species. The information communicated in this paper, though of a very general kind, is sufficient to shew how easy such inquiries may become, when the state of natural productions shall have been ascertained and classified according to a territorial arrangement; and also what interesting results may be obtained from investigations of this nature if properly conducted.

The Society's Library has been enriched during the past year, by donations of a large number of valuable works, presented by Members and others. The Committee would particularly notice a second donation from Mr Christy, re-

ceived since the date of last Annual Report, comprising about twenty-four volumes and treatises on Botanical subjects; also the highly valuable donation, from Mr David Steuart, of thirteen volumes of the Linnean Society's Transactions. A list of these, and of the other donations to the Library, will be found at the end of the Proceedings; and the special thanks of the Society are again offered to the various donors. A few volumes only have been added by purchase; the Society's funds not yet permitting a larger expenditure for that purpose. The Society must, therefore, for some time, continue to look to donations as the chief source from whence the increase and improvement of the Library may be expected to arise.

The attention of Members is particularly requested to certain alterations on the Laws (*vide* Appendix, No. I.), relating to the distribution of the Society's duplicates, and the proportions of these to which correspondents are entitled in return for specimens contributed. It will be seen, "that any Member who contributes 500 specimens of British plants (including at least 100 species), shall be entitled to a portion of the Society's Foreign plants, if desired, but only at the rate of 100 species of Foreign plants for each 100 species of British plants so contributed." It has also been enacted, "That if the Society shall be unable to supply the number of desiderata to any Member not wishing Foreign plants, it shall be in the power of such Member, either to take his parcel as made up, or to allow it to lie over till the following year's distribution, in which it shall be placed according to his order in the list, without any farther contribution for that year; this privilege, however, not to extend beyond three consecutive years." By the former of these regulations, correspondents, whose British collections are nearly complete, have an inducement afforded to continue their annual contributions, for the purpose of obtaining a share of the Society's foreign duplicates. By the

latter regulation, correspondents not wishing foreign plants, and whose desiderata are few in number, or cannot be easily supplied, may participate in *two*, or even *three*, of the Society's annual distributions, without being required to contribute additional specimens during the interval. Members will please to observe, however, that, when Foreign plants are wanted in exchange for British, it is necessary to *intimate such a wish*; as also to state whether they desire *Foreign plants only*, or a *part* British, and *part* Foreign.

It may here be remarked, with reference to the Collections which the Society are engaged in forming, that, probably for some years, specimens of the most common, as well as of the rarer plants of a district, will be acceptable, for the purpose of supplying blanks in the Herbarium, and completing the tabular views of the geographical distribution of species which it is the wish of the Society to exhibit.

It may at the same time be mentioned, that hitherto a very small proportion of Cryptogamic specimens has been received, and that contributions of Musci, Hepaticæ, Lichenes, Characæ, Algæ, and Fungi, will supply important desiderata in the Society's Herbarium, and in the Herbaria of several of their correspondents who have applied for them.

A Committee having been appointed by the Society to draw up a Catalogue of Fossil Plants, with a view to the formation of a collection in that department, the assistance of Members is particularly requested in contributing specimens of Fossil Plants, Woods, and Seeds, or of any other vegetable remains in a fossil state.

The Society are also desirous to form collections of Fruits, Flowers, &c. preserved in the moist state; of Seeds; of Woods, Barks, Gums, Resins, &c.; of Vegetable Monstrosities and Anomalies; and generally of all specimens of an interesting nature connected with the Vegetable Kingdom. They will, therefore, gladly acknowledge contributions of the above description; and they have no doubt that, with the aid of the numerous body of Members of which the Society

now consists, a valuable and extensively useful Botanical Museum may ultimately be formed.

In these departments, it may probably not be in the power of the Society to carry out the principle of exchange to the same extent as has been done with their other collections, but they will be desirous to do so as far as practicable.

The Committee, looking to the importance of cultivating an extensive correspondence, embracing Public Institutions as well as individuals, beg to repeat the statement made in a former Report, that the Society will with pleasure engage in an interchange of specimens with any Universities, National Institutions, or Societies of established reputation, forming Public Herbaria, whether in this country or abroad.

Members of the Society at a distance, as well as those resident in Edinburgh, are invited to send Communications and Papers, to be read at the Ordinary Meetings. The Society in all cases retain an Abstract of the Papers communicated, for publication in their Proceedings; but the Papers themselves are returned, if desired, and may be published elsewhere, unless the Society should specially request and obtain permission to publish them fully in their Annual Report.

The Committee are happy to state, that they have been able to secure the services of Mr Kellerman, the Assistant Curator, for a longer period than they contemplated, as it is not now his intention to go abroad as a collector till the summer or autumn of 1840; and they embrace this opportunity of again recording their approbation of the manner in which he has discharged the arduous and important duties of his office, the labour attending which has been greatly increased during the present year, by the examination and arrangement of the large collections in the University Herbarium.

The length to which this Report already extends will prevent the Committee from enlarging farther on the events of the past year. They will therefore merely refer to the "Report on the Progress and State of Botany in Britain,"

by Professor Graham, the President of the Society, an abridgment of which will be found at the beginning of the Proceedings.

They must in an equally brief manner record the names of the contributors of Papers and Communications noticed in the Proceedings, viz. :—Professor Graham, Mr Edward Forbes, Mr William Brand, Mr T. W. Morrison, Mr Herbert Giraud, Mr W. Gardiner junior, Mr J. M'Nab, Dr J. H. Balfour, Mr Samuel Wright, Dr Greville, Mr Daniel Ellis, Dr Douglas Maclagan, Dr Walker-Arnott, and Mr W. H. Campbell, to all of whom the thanks of the Society are especially due.

The best thanks of the Society are likewise returned to the various Local Secretaries, to whose exertions the Committee are satisfied that the prosperity and rapid increase of the Society are in a great measure to be attributed. Several gentlemen have volunteered their services, and been appointed Local Secretaries, since the date of last Report ; and the Committee would willingly receive suggestions from Members, for the appointment of others, in places where they might be deemed useful.

Mr Pamplin, of No. 9 Queen Street, Soho Square, has been appointed Agent for the Society in London, and parcels transmitted to his care are forwarded by him at stated periods to Edinburgh. Correspondents who can communicate with London more easily than with Edinburgh, are requested to send their parcels through the above medium.

In conclusion, the Committee beg to express a hope that the present Report will afford satisfactory evidence of the progress which has been made by the Society during the preceding year ; and they are confident that no exertions will be wanting on the part of the Office-Bearers, to whom the management of the Society is entrusted, to extend its sphere of usefulness, and prove its objects to be deserving of the support of all who are friendly to the cause of Botany.

EXTRACTS FROM A
 REPORT
 ON THE
 PROGRESS AND STATE OF BOTANY IN BRITAIN,
 FROM MARCH 1838 TO FEBRUARY 1839, BOTH INCLUSIVE,
 BY PROFESSOR GRAHAM, PRESIDENT.

Read at the Third Anniversary Meeting, 14th March 1839.

GENTLEMEN,

In obeying your instructions, to read at this Third Anniversary Meeting of the Society a Report of the Progress and State of Botany in Britain during the last twelve months, I shall not begin by pointing to the rapid strides which the Society itself has made towards the ends for which it was instituted; but leaving that, and the proud gratulations which may accompany the exposition, to those whose duty it will be to prepare the Annual Report, I shall pass at once, and without preface, to the task which you have assigned to me, and I shall attempt to make a rude classification of the subjects which such a Report ought to contain, bearing in mind that the space allotted to me in the Proceedings, compels me to go as little as possible beyond a catalogue of observations which have been published on these subjects.

The first class of publications which I purpose to notice, consists of those which have reference to vegetable organization; and I shall begin with the translation, by Dr Wood of Bristol, of the observations of Dr Schleiden, continued in the London and Edinburgh Philosophical Magazine for March 1838, and briefly noticed in the Report of last year. This portion of the Essay begins with observations on the constitution of parietal

placentæ, and in illustration of his opinions, the author refers to the gradual changes of form in Aroideæ, *Dorstenia*, *Ficus*, *Rosaceæ*, *Fumariaceæ*, and *Cruciferæ*, but especially in *Abietineæ*, which he conceives particularly show that the placenta is independent of the carpellary leaves during its growth. He thinks the bracteæ are really the carpellary leaves in these plants, and what Brown has called, and others following Brown, have considered, an open ovarium, he believes to be an expanded scale-like placenta. Don, in a paper in the *Annals of Natural History* for May 1838, in which he describes two new genera of *Cupressineæ*, thinks that the structure confirms Mr Brown's view, and militates against that of Schleiden.

In reference to the formation of the sac of the embryo, he observes, that the only thing which is essential to its formation is, that one of the parenchymatous cells at the summit of the axis or nucleus, takes on a particular action, and being developed greatly more than the others, becomes the sac. This takes place in every Phænogamic plant long prior to impregnation, but in all other respects the sac is subject to variation. He describes the integuments as formed by lateral projections from the neck of this axis or nucleus, and the gradual contraction of these over the axis, leaving only the micropyle through which the axis is exposed. He then states, that, in accordance with the observations of Amici, Brongniart, and Brown, he traced the pollen tubes from the stigma to the ovulum. He ascertained this in upwards of 100 different families, and has no doubt that a similar process takes place in all Phænogamia. He has seen two or three tubes enter the micropyle in many plants, —from three to five in *Phormium tenax*, scarcely ever less than three, and once seven, in *Lathræa squamaria*. Rarely, however, could he trace more than one of these into the intercellular passages of the nucleus, but this passing forward to the enlarged parenchymatous cell (the sac of the embryo already described as formed in the apex of the axis or nucleus), indented it, pressed the indented portion inwards, and formed within the axis, by this indentation of its surface, the cylindrical bag, which he had before shown was the first stage in the development of the embryo. He thus describes the extremity of the pollen tube as holding precisely the same relation to the enlarged parenchy-

matous cell that the viscera hold to the serous membranes in the adult animal,—enveloped by it, and yet on its outer side. Dr Schleiden believes that it is the extremity of the pollen tube thus lodged which becomes the embryo; and he asserts that, in *Taxus*, and very easily in *Orchis*, he was able to withdraw this portion of the tube from the sac, even when considerably advanced in the first stage of the formation of the embryo. The author, in accordance with these views, comes to a conclusion which it would be easy to prove fanciful, that our notions of sex among plants should be reversed.

Dr Schleiden points out the fundamental unity which these views establish between Phænogamic and Cryptogamic plants, the grains of pollen in the first being considered equivalent to the sporules in the second,—the pollen only requiring a formative process within the plant to fit it for germination, whereas the sporule is developed into a plant without that preparation. The essay is then concluded by an acknowledgment from the author, that all the views given are not claimed by him as original, but that its limits did not give him space for stating whence they were derived. This he proposes doing in a separate and enlarged publication: he had not, however, admitted any statement without instituting an investigation to prove its correctness.

In my notice last year of the early part of Dr Schleiden's very interesting paper, I regretted that it contained some asperities of criticism, which, though employed on the right side, were not agreeable. The continuation of his paper which I have just noticed, shows the author to be very ready to step forward honourably in defence of others, where he thinks attempts are made to rob them of the credit of scientific discovery. The handsome and animated manner in which he claims for Amici and Brown, discoveries which Corda, in his history of the development of the Coniferæ, appears to have stated as his own, and to have obtained credit for, is mixed up with expressions certainly the reverse of lenient.

The next publication which I shall notice as having issued from the British press since our last Anniversary, is the able work on the Principles of General and Comparative Physiology, by our fellow-member Dr Carpenter.

I feel quite unable, in the brief space which I have allotted to the purpose, or perhaps in any circumstances, greatly to condense the mass of important information, or to show the force of the synthetical reasoning with which the volume teems, though I cannot say that I am in *every* instance willing to grant the author's premises, nor *always* ready to adopt his conclusions. With great confidence, I can recommend to the Society the careful study of this highly creditable book of our talented friend; for I entertain no fear that many unguarded expressions which it contains, will be thought to advocate opinions which, I am persuaded, are not those of Dr Carpenter,—the unphilosophical and thousand times refuted absurdities of heartless, senseless, impious materialism.

In consequence of the similarity of Dr Carpenter's views, regarding reproduction in vegetables, with the opinions of Dr Schleiden, I am induced at this place to give the only notice of his book which my space and time will afford. Like Dr Schleiden, he conceives that the grains of pollen are strictly analogous to the sporules in Cryptogamic vegetables,—that both contain the basis out of which the young plants are reared,—that, in the lower orders of plants, they require no preparation within a second class of organs, previous to their being detached from the parent, while in the higher, they must be received into the tissue of the pistil, to be reared to the condition of perfect seeds; in which state, the series of changes in their evolution may be suspended for an indefinite period. The simplest conceivable form of vegetable organization, he illustrates, among the Algæ, by the *Protococcus nivalis*, in which he thinks there is no separation of the organs of nutrition and reproduction, so that the plant may be considered either all root or all pollen. It is, of course, entirely composed of cellular tissue, and within each cell there are many minute granules, which at last rupture the cell which produced and contained them, and in their turn produce parricides, and these again other generations in succession, the parent cell being in every instance employed both in the nutrition and production of the cells within it, and its life being terminated by the breach of its organization, caused by the escape of these cells. In the higher Cryptogamia, there is a separation of the organs of nutrition and reproduction,

These last are collected in distinct portions of the individual, and their escape, therefore, does not terminate the existence of the parent. If I do not misunderstand Dr Carpenter, he thinks that the remarkable motions in these granules, long ago pointed out by Mr Brown, are characteristic of, though not universal among them. He cannot, however, be ignorant, that Mr Brown at first thought so too, but soon convinced himself that such motions are seen in all matter, organic or inorganic, when it can be reduced to a sufficiently fine powder, and suspended in water. Passing upwards in the scale of being, we see many Cryptogamic plants in which there is a distinct set of organs separated for reproduction; but Dr Carpenter is of opinion that, in the Marsileaceæ, we have the first appearance of *two* classes of organs; that in which the reproductive cell is formed, analogous to the stamens in Phænogamic plants, and another which receives it, and continues its elaboration till it is fit to be discharged externally, and to germinate. This separation, however, can only as yet be considered incipient, for both these organs are found as within the same capsule. Passing upwards from the Cryptogamia, we find the separation complete in the parts of the stamens and of the pistils in Phænogamic plants; but even here, Dr Carpenter quotes the buds which form in several instances on the edges of the leaves, as in *Bryophyllum calycinum*, and *Malaxis paludosa*, to shew that the disunion between the reproductive organs, and organs of nutrition, is never complete. One point in which Dr Carpenter and Dr Schleiden differ is, that, while the former considers the perfect seed in Phænogamic plants to be produced by the development of one of the granules transmitted along the pollen tube, the latter believes that there is a development of the extremity of the pollen tube itself.

Entertaining, as I have long acknowledged that I do, the strongest conviction that the phenomena of reproduction in animals and vegetables will be found to be essentially the same, I cannot participate in the feeling of Dr Schleiden, who considers it "embarrassing ourselves with lame analogies," to draw these from the animal kingdom. I am, therefore, unwilling to pass from the notice of Dr Carpenter's book, without quoting, in corroboration of my belief, a case in which he

thinks there is, in one of the lowest grades of animal existence, the same union, and diffusion over the whole surface, of the powers of nutrition and reproduction, which he finds among vegetables, in the simple structure of *Protococcus nivalis*. The parallel instance in the animal kingdom is afforded by the *Volvox globator*. This animal, like the vegetable *Protococcus*, consists of a single cell, upon every part of the internal surface of which its young are produced. After a time, these are separated from the parietes, and swim about in the cavity, till the parent bursts and dies, to permit the young to escape. Even before they escape, however, the young are found to contain others, and thus the succession of evolution and destruction goes on precisely as in the simplest form of vegetable life.

Tracing the phenomena upwards to animals with somewhat more complicated organization, the reproductive organs are found collected in particular spots; and the analogy, I am convinced, will one day be shown to exist between the higher classes of animals and vegetables, as well as between the lower; but Dr Carpenter wisely abstains from urging this doctrine, in the absence of sufficiently precise observation. I leave this subject, and the work which gave rise to these remarks, with reluctance, but my limits require that I should pass on to others.

In the *Annals of Natural History* for last month, is published part of the observations of Mr Giraud on the structure of pollen, read by him at two of the ordinary meetings of the Society. In this part of his paper, Mr Giraud demonstrates the existence of a third tunic in the pollen granules of certain plants. I feel sure that Mr Giraud will be pleased to find, from a note by the editor, that Fritzsche had before, in the *Transactions of the Petersburg Academy*, published a similar discovery, and even shown that, in some plants, a fourth tunic existed. Mr Giraud certainly was not aware of these observations, and those who know him will feel assured that, in his modest pursuit of truth, he will be far more pleased to find, that his observations have been confirmed by another observer, than to know that they had the merit of priority. That they were independent, however, is perfectly unquestionable.

Mr Giraud also notices the discovery of minute particles, external to the pollen grains in *Polemonium cæruleum*, and ad-

hering to them, and possessing that motion in water which I have already stated Brown has shown to be possessed by every minute particle in similar circumstances. Farther, Mr Giraud, says, and I think correctly, that he has shown that the vertical line, which is seen on the pollen grains of many plants, but the nature of which has been misunderstood, is merely a fold from drying of the membrane, and is removed by moisture. Lastly, Mr Giraud states, that he has detected carbonate of potassa as a constituent in the pollen of *Antirrhinum majus*.

In the *Annals of Natural History* for April 1838, there is an account, on the high authority of Mr Berkeley, of the fructification of the Pileate and Clavate tribes of Hymenomycetous Fungi, and his observations are illustrated by two plates. He corrects his own previous statements, and the views of others; and says, “the essential character of hymenomycetous Fungi appears to consist in a hymenium, composed of closely packed sporophores, which support on spicules a generally determinate number of spores;” and his investigations have led to an altered arrangement of genera, and a tabular view of affinities, as to the correctness of which in all points, however, he speaks with that modesty which is the natural consequence of much information on an obscure subject. He says, “The facts stated confirm, in a striking degree, the theory that a quaternary arrangement prevails in Cryptogamic plants;” while “few facts are more curious than that the number four should prevail when the fructification consists of spores, and a multiple of four when it is contained in asci.” Of course, in an account, necessarily so brief, of a highly interesting paper, I can do it no manner of justice, and I would strongly recommend it for attentive perusal.

Mr Valentine has discovered stomata in Mosses, as appears in a letter from him to Mr Solly, read at the meeting of the Linnean Society in April. They are, as far as yet observed at least, with one exception only, confined to the theca; and they most commonly consist, as among Phænogamous plants, of two kidney-shaped opposite cells.

A short paper by Meyen is translated, in the *Annals of Natural History* for November, from Wiégmann’s Archives. It gives an account of the breaking down of the fibres of flax into

minute shining particles, each consisting of a small portion of the tube of which the flax fibre is composed, and believed to correspond with one of the cells of the series out of which the tube was originally formed, the ends of the cells having been absorbed, and the edges of the walls united together to form the outer layer of the tube, which was afterwards strengthened by deposition of new layers within. These layers were separated by the same process which disjoined the original cells, namely, by long-continued boiling in water, or, more perfectly, by boiling in muriatic acid. These observations, Dr Meyen thinks, may afford some indications to explain the origin of the fibres of the muscles and nerves of animals.

A short letter from the Rev. Mr Reade is published in the same excellent periodical, the *Annals of Natural History* for April, announcing the existence of spiral vessels in the roots of Dicotyledonous plants. This confirmation of an old opinion does not at all surprise me. I have always contended that the modern opinion regarding the limited distribution of these vessels, was even more obviously erroneous than the notion that their contents were always gaseous.

In the *Annals of Natural History* for June, there are some interesting remarks by M. Decaisne on the structure of the roots of madder, and the conditions of its colouring matter.

In the *Edinburgh New Philosophical Journal* for April, there are some observations by Unger, to show that the crystals which exist in plants are placed in the cells, not in the inter-cellular spaces as some have supposed, and that they are unconnected with the vascular bundles. Most commonly they are found in the parenchymatous cellules, but Meyen had found them in the epidermic cellules of *Phrynium zebrinum* and *Tradescantia discolor*, and Unger has added to these *Goodyera repens*.

The first paper in the number for January of the *Annals of Natural History*, is one by Pictet, translated from the *Bibliothèque Universelle de Genève*. It is on the writings of Goethe relative to Natural History, and though it chiefly bears upon the animal kingdom, it deserves the attention of botanists, because it explains the principles of his system,—principles which are equally a matter of interest to the philosophical student of

the vegetable kingdom. An ideal type is fixed for an organized kingdom generally, or for any subdivision of it. With this type individual forms are compared, and the principle is contended for, that, in the development of each, one part becomes predominant at the expense of some other, and *vice versa*; excessive evolution of one set of organs, must necessarily produce inverse modifications with regard to others.

In the Gardener's Magazine for March, there is a paper by Mr Munro on the formation of double flowers. Among various theories considered by him erroneous, is one said to be on my authority, that excessive richness in the soil is the cause. I am not aware that I ever said more than that a plethoric state has been considered the cause by some. In fact, I believe that any agent modifying the normal state of the functions, whether that agent produces plethora or a reverse condition, tends to the production of full flowers in some species. In many instances, plethora only invigorates healthy action. I do not think Mr Munro's ingenious notion, that there are various circulating systems, independent of each other, within the vegetable, is either supported by, or explanatory of, the phenomena which he observes; and I think, if he considers more fully the analogy which he points out in the animal body, he will see that it contradicts his opinion.

After giving such a superficial view, as the limits of the present report would permit, of the observations which have been made on vegetable organization as bearing upon larger classes, or vegetation generally, I intended next to have alluded to remarks which have been made on individual genera and species. I find, however, that I have already devoted more space than I ought to this division of my subject, and cannot possibly dwell longer upon it, considering the multitude of others which are yet before me. Even such a paper as that of Griesbach, therefore, in the Annals of Natural History for March, must be passed over; though, besides some interesting remarks on the curious structure exhibited in the germination of *Limnanthemum lacunosum*, there are some general observations derived from them regarding the *Menyanthideæ* and *Gentianeæ*. For the same reason, I must omit notice of some observations made by M. Horkel on the structure of the seed, and on the germination

of the genus *Pistia*, though they lead to what he considers an erroneous arrangement of this and *Lemna* by Lindley. His observations are translated into the *Annals of Natural History* for May.

Sir Edward Ffrench Bromhead has published in the *Edinburgh New Philosophical Journal* for April, and continued in the number for July, a paper entitled "An attempt to ascertain characters of the Botanical Alliances." The same ingenious and laborious author has a paper in the April number of the *Magazine of Natural History* on the affinities of *Lathyraceæ* and *Vochyaceæ*. It is wholly impossible to condense these papers so as to give an intelligible view of them in this report. To be understood and appreciated, they must be studied entire.

The only other paper which, so far as I know, has appeared in Britain during the last year on botanical arrangement, is one by Mr Bird, on the artificial arrangement of the genera and species of some of the more extensive natural orders and largest genera among British plants. The paper is published in the *Magazine of Natural History* for November, with a promise of its continuation, but no more has yet appeared. The arrangement is binary, purely artificial, and extends only to the British genera of *Brassicaceæ*, *Scrophulariaceæ*, and *Lamiaceæ*. Notwithstanding the modern mania for having every thing natural, which, I conceive, is utterly impossible in any linear arrangement, I am not in the least afraid to acknowledge that I think some such plan as that proposed will prove most useful to the tyro in botany, for whom alone it is suggested. If Mr Bird would go one step farther back, and adopt the Linnean classification, he would retain as votaries to botany, and secure as ultimate admirers of a natural method, many whom the difficulties which it presents on the threshold drive away from the science. Botany requires only to be known to secure followers; but few will give themselves much trouble to become acquainted with any thing of which they are altogether ignorant, unless some degree of information in regard to it can be *easily* acquired. This is effected by an artificial classification, by means of which an inducement is held out to inquire after the far more exquisite attractions beyond it.

Several communications or short notices, illustrative of botanical geography, have appeared during last year. I fear I can do little else than give an incomplete catalogue of them. In the Annals of Natural History for May, there is an interesting account of Mr Gardner's journey to, and residence of nearly six months among, the Organ Mountains, with remarks on their vegetation. In reading over the list of plants, one is amused to find our adventurous natives, *Sonchus oleraceus* and *Stellaria media*, making themselves quite at home among their new acquaintances *Begoniaceæ*, *Melastomaceæ*, and *Cap sicums*, with many others which certainly will not return the visit of our emigrants.

After giving a rapid view of the vegetation of the Organ Mountains at an elevation of 3000 feet, he mentions the result of two excursions to an elevation of nearly 3000 feet more. His botanical harvest was exceedingly rich, but the journey very fatiguing, in consequence of the necessity of cutting a path through bamboos and other inhabitants of the forests. The bamboos were of large size, and their internodes generally about half filled with water, which, instead of being refreshing as usually represented, was particularly disagreeable. Cacti, *Amaryllides*, *Begoniæ*, parasitical *Orchidaceæ*, a species of *Fuchsia*, an *Eriocaulon*, a *Vaccinium*, a *Gaultheria*, a *Melastomaceous* plant, and an *Alstroemeria*, are among the most interesting plants which he found at this elevation.

In the same number of the Annals of Natural History, there is the continuation of a sketch by Allan Cunningham of the botany of the Islands of New Zealand, the earlier part of which was published some time ago in the Companion to the Botanical Magazine. Several of the most useful timber-trees are noticed in this portion of the communication, and among others one, *Dammara australis*, which has been so strongly recommended for naval purposes, that I am informed it has lately been imported into one of our dock-yards.

This account of the botany of these highly interesting Islands is continued in the Annals for July, August, September, October, November, January, and is promised in subsequent numbers, having only as yet reached *Cucurbitaceæ*. The whole communication is full of botanical interest. What will perhaps

strike the general reader—the *cui bono* man—as of greatest account, is the number of valuable woods which are described as applicable to many purposes both of national and domestic importance. One circumstance, mentioned in a note, regarding the botany of Australia, I am induced to notice, as bearing upon a question which I brought before the Society long ago. It may perhaps be in the recollection of some, that, after the return from a botanical excursion into Perthshire and Stirlingshire, I gave an account of a curious combination, observed in the *latter* county, of the stems of elm, holly, and ash trees; and an apparent union of horse-chestnut and beech observed in the *former*. I stated that though, especially in reference to the elm and ash, there was a union apparently so perfect, that it was impossible to say where the one terminated and the other began, yet I could not believe they adhered otherwise than by juxtaposition, or that there was any transmission of fluid from the one to the other. A still more incongruous union is mentioned in the note to which I have alluded,—the firm union, as if by engrafting, of a *Quintinia*, a large tree of the natural order *Saxifragaceæ*, with a Tree-Fern. No one, I think, will believe that there could be an interchange of fluids there. I beg to be permitted to continue this digression, in illustration of a general principle. In my former communication, I prognosticated the death of the horse-chestnut and the holly, as soon as they should be severally embraced by the elm, the ash, and the beech; because, as the whole zone of bark would be then destroyed, the assimilated fluids could not pass down for the nourishment of the inferior part of the trunk. One stem of holly had already died from this cause, and another seemed fast following. Mr Cunningham, however, tells us, that, though, near the top, the *Quintinia* formed one side of the united stem, and the Fern the other, yet, lower down the *Quintinia* completely enveloped the Fern, so as to present but one trunk of great bulk for upwards of twenty feet. Notwithstanding this, however, the Fern spread forth from the top its noble tuft of fronds, evidently not in the slightest degree inconvenienced by the embrace it was receiving below. The reason I am persuaded is, that the Fern transmits its assimilated fluids through internal vessels.

One of the late discoveries in botanical geography, and which hereafter may probably be of great commercial importance to this country, is the detection of the Tea-plant in Upper Assam. Dr Wallich, Mr M'Clelland, and Mr Griffith, were sent to investigate the subject. An account of the Mosses collected in this expedition was read to the Linnean Society in March 1838. Their number is very great,—about one-eighth of the whole known species. An enumeration of the genera and species is published in the *Annals of Natural History* for May.

In the *Annals of Natural History* for July, there is an account by Professor Henslow of the botany of the Keeling Islands, a small coral group nearly 600 geographical miles to the southwest of the Straits of Sunda, and the general level of which, except partially where there are hillocks of sand, does not exceed six or eight feet. Even here British enterprize has fixed a Settler; an Englishman has transported his family and about eighty Malays thither, and employs them in the manufacture of coconut oil. With the assistance of these persons, it is believed that a very complete collection of the native plants has been made, and their whole number only reaches to twenty-three, of which fifteen are dicotyledonous, four monocotyledonous, and two acotyledonous. Of the remaining two Professor Henslow had received no specimens, but they were said to be trees, and were probably dicotyledonous. It may interest the Society to know that the scanty Flora of this remote scrap of the world's surface contains three plants which are included in the British Flora,—a grass, a moss, and a fungus.

In the *Annals of Natural History* for October and February, we have an account by Bentham of the plants collected in British Guiana by Schomburgk, and of others from French Guiana, obtained from the Museum of Natural History of Paris and from Baron De Lessert. The account hitherto only extends to Compositæ, Gentianaceæ, Scrophulariaceæ, Lamiaceæ, and Verbenaceæ.

Illustrations of Indian botany by Wight and Arnott are given in the *Annals of Natural History* for July and October.

A paper on the botany of the Channel Islands, by Mr Babinington, was read before the British Association at Newcastle in September, and is published in the *Annals of Natural His-*

tory for January. Some very interesting additions are made to the Flora of these Islands; one or two of them have now acquired a better title to introduction into the British Flora, having been since found in England; and it appears that one of the best, *Arthrolobium ebracteatum*, had been collected in abundance even so early as April 1838, on Tresco, one of the Scilly Islands, by Miss White.

In the Magazine of Natural History for last month, there is a paper by Mr Carter, giving an account of some of the natural objects in the neighbourhood of Cheadle, Staffordshire, and containing a useful list of plants, and some judicious observations regarding the geographical distribution of several of them. I wish we could see such lists more frequently, they would assist the Society greatly in its attempts to increase and methodise the known facts regarding the geographical distribution of British species.

Several additions have been made to the British Flora during last year, whereby our knowledge of the range of scarce plants has been extended. I before noticed the results of the expedition made to the west of Ireland with this view last August. Mr J. Ball of Cambridge, Fellow of this Society, made a more extensive tour in the west of Ireland the year before, but the account of it was not published till September 1838, in the *Annals of Natural History*. He reports the following additions to the Flora:—*Koeleria vallesiaca* on Ben Bulbin; *Epilobium nutans*, by the side of a stream descending from Currough-na-Gorragh, a small lake at a considerable elevation on Curslieve, one of the highest mountains in the Erris group; *Sagina filiformis*, on banks above the village of Howth; *Leontodon alpinum*, on the mountains south of Glen Cree, a valley running between Powerscourt and Lough Bray. If this last be the *Apargia alpina*, as is probable, I gathered it many years ago on mountains in Sutherlandshire, and, after examination, was forced to conclude that, by not very distant grades, it passes into *Apargia autumnalis*. *Gentiana Amarella*, with white flowers, near Ballina. This variety I found in great quantity upon the top of the cliff to the southward of South Shields, when accompanying a party from Newcastle, after the meeting of the British Association last year. At Colin Glen, a few miles

from Belfast, in ascending from the lower woody part to the rocks on the summit, Mr Ball observed “the gradual transition from a very divided form of *Aspidium angulare*, through the forms named *aculeatum* and *lobatum*, to one on the rocks above which cannot be distinguished from *A. Lonchitis*.” I have observed the same thing in Scotland, but must nevertheless consider *A. Lonchitis* specifically distinct. Mr Ball has, on the authority of Miss Keown, fixed the hitherto vague Irish habitat of *Achillæa tomentosa*, near Newcastle, in the county Down.

Many excursions were, as usual, undertaken in the neighbourhood of Edinburgh by members of the Society and others, and the results of these, in increasing our acquaintance with the Flora of this district, have been laid before you.

In the detail of the first excursion made by the members of the Botanical Society of London last summer, and the only one I see published (*Mag. Nat. Hist.* for October), the plants mentioned which we have not near Edinburgh are *Ulex nanus*, *Hypericum elodes*, *Teesdalia nudicaulis* (a single specimen), *Hottonia palustris*, and *Orchis Morio*. The last two are not found any where in Scotland; the first two, though they occur abundantly, are, I believe, confined to the west coast; *Teesdalia* occurs on both sides of the island, but has not yet been observed near Edinburgh. The hirsute variety of *Calluna vulgaris*, which is stated not to have been observed near London before, or at least not lately, and is said to have been generally overlooked, is far from being scarce, especially near the shores all round Britain. I have received it from Cornwall, and I have picked it in Cheshire, in Galloway, and many parts of Scotland, especially to the northward of Tain, where, as well as on the coast of the Moray Firth, it is the common form for miles together, and really whitens the ground. It passes by insensible degrees into the glabrous state.

When I wrote these remarks on the London excursion, I forgot or overlooked the pertinent observations which it had elicited from Mr Luxford, in the Magazine of Natural History for November. It is scarcely worth while correcting the statement of Mr Luxford, that the Breadalbane range is the only British station of *Arenaria rubella*; nor is it necessary to confirm his accurate remark regarding its places of growth, by

observing, that the station in which I have twice gathered it, (Ben Hope, Sutherlandshire), though very nearly 150 miles distant in a straight line from the Breadalbane range, is a similar micaceous rock. It would be easy, from our Scottish Flora, to point out innumerable examples in confirmation of Mr Luxford's views.

Dr Johnston of Berwick thinks we confound *Cardamine sylvatica* with *C. hirsuta*, in the British Floras; and having discovered the former in the Dean at Twizel House, Northumberland, he states, in the Annals of Natural History for November last, the character by which he thinks it should be distinguished as a species.

In the supplementary number of the Annals of Natural History, published last month, Mr Forster, after more than fifty years' observation of the plant, confirms the opinion of Mr Babington, that *Atriplex rosea* is a distinct species. It is common on our shores.

Mr Babington, in examining British specimens of *Urtica pilulifera*, has detected what Linnæus called *U. Dodartii*, which had been confounded with it, and has established this point, by careful comparison with various authentic specimens, including those in the Linnean herbarium itself. This species must, therefore, be admitted into the British Flora; and its characters are given in the May number of the Annals of Natural History.

Cuscuta Epilinum is found, by Mr J. E. Bowman, to be common in flax fields. It has, therefore, been admitted into the British Flora. Mr Bowman's observations are published in the Magazine of Natural History for June.

In the London and Edinburgh Philosophical Magazine for June, there is a notice by Mr Babington on the structure of *Cuscuta Europæa*, in some respects previously misunderstood. In the Annals of Natural History for July, Mr Babington defends his views with respect to the subdivision of the *Habenaria bifolia* of British authors. The subject has been often before the Society, and the extreme forms of *H. bifolia* and *H. chlorantha* are quite familiar to every one who has botanized in the neighbourhood of Edinburgh, and many of us have found them very widely distributed elsewhere.

In the *Annals of Natural History* for December, Mr Babington divides the British species of *Lotus* into four, *L. corniculatus*, *L. major*, *L. angustissimus*, and *L. hispidus*, and gives specific characters for each.

Mr Berkeley's paper on British Fungi, begun in the *Magazine of Zoology and Botany*, and noticed in the Report of last year, has been continued with additions and corrections in the *Annals of Natural History* for May and June.

A remarkable variety of *Viola lactea*, is mentioned by Sir William Hooker, in the *Annals of Natural History* for January, as found by Mr Nicholson in the neighbourhood of Lincoln.

In the *Magazine of Natural History* for March, there is a paper by Mr Newman on the British species of the Linnean genus *Polypodium*, including under this title, *Polypodium*, *Woodsia*, *Aspidium*, and *Cistopteris*. Mr Newman is trammelled by no previously received opinions, thinks boldly for himself, denounces genera as unnatural, adopts a new arrangement, points out new sources of character, and reduces the British species of the united genera to eleven.

In the *Annals of Natural History* for October, Mr Forster confirms the statements of Mr Bentham regarding *Ononis antiquorum*, after an examination of the Herbaria of Linnæus and Smith. He also makes some observations regarding *Ononis arvensis*.

Before I leave the consideration of the alterations on the British Flora, I may remind the Society, that *Erica carnea* must be excluded, in consequence of our investigations in Galway last year. I fear the claims of *Pyrus domestica* to be considered a British native, were somewhat impaired by the observations of Mr Lees, read to the Society in January 1838, and published in the *Edinburgh New Philosophical Journal* for April. If, however, the original plant were really introduced 400 years ago, and still lives, even though none of its offspring may have been naturalized, I would think it almost unkind to reject it.

In the first article in the *Gardener's Magazine* for December, there are some judicious observations regarding the limits within which the acclimatizing plants is possible, and the means to be taken for that purpose.

The influence of stocks on grafts has been often disputed, and is certainly overrated; but in an account of Bedford Lodge in the Gardener's Magazine for September, it is stated that tender roses were preserved from injury in the severe winter of 1837-8, by having more hardy ones budded on their extreme branches. Those which did not carry the hardier varieties on their branches were injured. If there is no mistake here, from the position being more or less sheltered, or otherwise more appropriate, the observation is a very interesting one.

I shall now very briefly state what observations, relating to Vegetable Physiology, have been published in Britain during the last year.

The first which I should notice are those by Dr Carpenter regarding the laws which regulate vital and physical phenomena, as they were published in the Edinburgh New Philosophical Journal for April; but as the substance of these is embraced in that author's work on the Principles of General and Comparative Physiology already, though very inadequately, adverted to, I must here pass them over.

In the Edinburgh New Philosophical Journal for October, there are some observations by M. Melloni, upon the cause which produces the speedy melting of snow around plants, and it seems quite satisfactorily accounted for by the theories of radiated heat. Some very curious facts regarding this radiation are stated and proved, but I cannot now do more than refer to the paper.

In the Magazine of Natural History for September, there is a paper by Dr Weissenborn of Weimar on spontaneous generation,—a paper filled with flimsy statements, which, if credited, would tend to set at nought the authority of the accumulated deductions of the best and wisest inquirers in all ages, and the strong evidence by which Revelation commands our assent.

It is unnecessary, in refutation of the impious nonsense of Dr Weissenborn, to point out to the attention of the Society some very pertinent remarks by Mr Blyth, in the September number of the Magazine of Natural History, nor to place the authority of Cuvier in opposition to that of Dr Weissenborn. I shall probably put the value of his testimony in quite as clear a light, if I mention a circumstance as to which his belief

is more pliable than it seems to be in matters of eternal interest. In the Report read to the Society last year, I noticed the alleged transformation of oats into rye. Dr Weissenborn reverts to this subject, and, in the Magazine of Natural History for December, brings, in support of the assertion, the Report of the Agricultural Society of Coburg.—Credat!

Dr Weissenborn tries, in the number for November of the Magazine of Natural History, to meet the arguments of Mr Blyth, by postulata which it is impossible to grant, and dreamy hypotheses without a shadow of reason.

In the Annals of Natural History for November, there is a translation of a condensed view, by Meyen, of a memoir by Dassen, on the very interesting subject of the motion of the leaves of plants. I confess, however, it is not always intelligible to me, the meaning of the author being so obscured, either in the condensation or in the translation, that I do not always understand his account of the phenomena, nor see the necessity of his inferences from them. Meyen seems to infer, contrary to the opinion of the author himself, that certain phenomena indicate real sleep in plants, and that phenomena exactly similar may be proved to exist in animals.

A paper was read before the Royal Society by Mr Rigg, on the influence of nitrogen in the growth of plants, and a brief notice of the paper is published in the Annals of Philosophy for August. The investigations of the author seem to have been experimental: he states, that the results of his analysis shew, that those parts of plants which perform the most important offices in vegetable physiology, contain most nitrogen; and he believes it to exert, under the living principle of the plant, a most important influence in moulding into shape the other elements.

A notice of observations by M. Boussingault, regarding the action of plants on the azote of the atmosphere, appears in the number for August of the London and Edinburgh Philosophical Journal; and the paper of Mr Rigg is followed up by observations, in the number for December, on the evolution of nitrogen during the growth of plants.

In the London and Edinburgh Philosophical Journal for January, there is a notice of an experiment by Edwards and

Collin, narrated to the Academy of Sciences, and which was intended to prove that water is decomposed during the respiration of plants, its oxygen going to the formation of carbonic acid. It is, however, matter of doubt, whether the carbonic acid formed was not the result of incipient putrefaction. The experiment consisted in confining some beans in a vessel filled with water for four days. Some free carbonic acid was collected, and more was found dissolved in the water, and as the beans grew readily in soil after they were liberated from this confinement, it was contended that they were uninjured. Perhaps it will be thought only to prove that the gemmule was uninjured; decomposition may have begun in a part of the unorganized fecula, as not protected by the vital principle. The disengagement of gas, however, was considerable even at the end of twenty-four hours.

In Loudon's Gardener's Magazine for April, is published a paper, read by Mr Niven at the meeting of the British Association at Liverpool, regarding the direction in which the sap flows, and that of the forces exerted in the phenomena of vegetation. Mr Niven saw, in spring, the first motion of the sap downwards through the pith; next through the layers of the heartwood nearest the pith; and this while the alburnum remained dry, and before any leaves had been developed. Mr Niven's experiments farther satisfy him, that there are, external to the wood, two forces, the one upwards for the development of leaves, the other downwards for the development of roots; that this led him to doubt the possibility of converting roots and branches severally into each other, and that he confirmed these doubts by subsequent experiments. In the following number of the same Magazine, Professor Henslow remarks of these observations regarding the direction of the two forces exerted in vegetation, that they are equally illustrated in roots pushing from the base of a cutting, and leaf-buds from the stools of felled timber. This is no doubt true, but the illustrations of Mr Niven are more striking, from the two phenomena being produced in similar circumstances, and almost in contact. When a mere boy, and amusing myself with horticultural experiments, I recollect often forcing out branches to fill blanks in wall trees, by removing a stripe of bark for more than half the circum-

ference of the stem *above* a bud ; and I recollect, when a little older, puzzling myself in vain to find a reason why the cut should not rather have been made below the bud, with a view to interrupt the elaborated juices.

In the Annals of Natural History for November, notice is taken of a paper by Dr Schleiden, in Wiegmann's Archives, where, it is said, that an exceedingly luxuriant development of plants is produced by the water, with which they are naturally supplied, containing much free carbonic acid.

It appears, from a notice in the Annals of Natural History for October, that Professor Sprengel of Brunswick had detected 3 per cent. of copper in the cinders of two species of *Trifolium*, but that he had satisfied himself that this was owing to the metal having existed in the soil in which the plants grew.

In the June number of the London and Edinburgh Philosophical Journal, there are some experiments by Mr James Blake to shew that the changes which take place on the surface of a leaf cause it to assume a positive state of electricity, negative electricity being given off to the surrounding medium. In the number for May of the same work, there are some extremely interesting observations of Dutrochet, contained in a paper read before the Royal Academy of Sciences at Paris, on the effects produced on the circulation in the *Chara flexilis* by heat, light, mechanical irritation, and chemical agents. I cannot condense, and therefore must not farther notice these observations, except to state, that I look upon them as important from their bearing upon the doctrine of vegetable irritability, and the laws which regulate it.

In the London and Edinburgh Philosophical Magazine for August, there is an abstract of a paper by M. Donné on the same subject. He found rotatory motions continued in the granules after they had been expressed from the tubes of the *Chara* ; and perhaps I might have been disposed to think that the motions perceived *without* the plant were only such as Mr Brown detected in inorganic molecules, but for the fact stated by M. Donné, that they are destroyed by all the agents which stop the circulation *within* the plant.

In the first article in the Gardener's Magazine, is supported the opinion that hybrids take the constitution of the female, and the characteristic features of the male parent. If this

shall prove to be true as a general law, it will indeed be a very curious fact, and one of great practical value; but I cannot help suspecting, that the observations are yet too few to entitle us to draw a physiological inference of such importance. In the same periodical for February, Mr Beaton gives some hints to cultivators for the formation of hybrids.

In the Annals of Natural History for November, there is a statement by M. Martens that a hybrid formation between two ferns, *Gymnogramma Calomelanos*, and *G. chrysophylla*, occurs quite commonly in Guadaloupe, and has been observed by him in the Botanic Garden at Louvain. It cannot be but that M. Martens mistakes a variety, or an intermediate species, for a hybrid, the occurrence of which among ferns I must believe to be impossible.

A paper on the often discussed subject, the nature of ergot, was read in November to the Linnean Society by Mr Smith, and is noticed in the Annals of Natural History for January. The chemical nature of this substance seems to have established the fact, that it is, or contains, a fungus; and Mr Smith says he has detected the minute and detached cellules of this fungus on the different organs of unexpanded flowers of ergot bearing spikes of a species of *Elymus*. He believes these cellules to be the articulations of a minute filamentous fungus, which is developed in the early stage of the flower, and propagates itself by the separation of the joints, impregnating the soil or the perfect seeds of the grass; and that, after the germination of these, some of the reproductive matter of the fungus is carried up with the growth of the plant, and develops itself in the flower, in the same way in which (as Mr Francis Bauer showed), the propagation of the smut of wheat is effected.

Before concluding this report, which I am sensible it is now more than time that I should, I beg to enter my protest against a fearful inundation with which botany is threatened. Dr Johnston of Berwick, who has long and successfully studied and written upon the British Zoophytes, proposed, with more liberality than kindness, to hand over to botanists the whole race of sponges; and a paper was read before the Linnean Society in June, and noticed in the August number of the Annals of Natural History, in which Mr Hogg supports these views. I certainly have not studied the subject so as in any measure

to entitle me to give an opinion derived from the structure of these creatures, or their physiological phenomena; but, in this utilitarian age, I hope to see botanists armed against the innovation, were it only on the ground of expediency. Let zoologists keep *their* cryptogamia,—the vegetable kingdom has more than enough.

Gentlemen,—There are still several subjects connected with the pursuits of our Society, upon which much information has been elicited during the last twelve months, and to which I meant to have presented you with a key; but I have already occupied far too much of your time, and shall now conclude with one painful yet consoling subject. The obituary this year records the death of the Countess of Dalhousie,—a zealous cultivator of botany, a liberal patron of the Society, and our only female Honorary Member. To great talent, and a highly cultivated mind, Lady Dalhousie added the kindest affability in private life, and a feeling and exemplary discharge of domestic duties which never was surpassed. She first began the study of botany as a solace in circumstances of severe domestic affliction, and she clung to it ever after with a devotion which marked her consciousness of the blessings it had conferred. Almost her last conversation turned upon the subject, and the intrusion of death, without even momentary warning, found in her hand a list of plants which she had just prepared as objects of attention during the ensuing season.

We have, at a still more recent date, to lament the death of our excellent associate Mr John Hunneman. There could not possibly be an individual who more willingly took every kind and degree of trouble to oblige his friends, and to establish an interchange of good offices among European botanists; nor could there have been broken a link which contributed more to keep together that class, and the loss of which will more seriously impede the free communication which for many years has existed among them. He was known to every body, liked by every body, and that reciprocity of kindness which he was entitled to expect, he always, on its manifestation, turned from himself upon some botanist whom he wished to bring into the scientific brotherhood which he had established, or whose connexions within it he wished to extend.

PROCEEDINGS
OF
THE BOTANICAL SOCIETY.

PROCEEDINGS.

Thursday, November 13. 1838.

PROFESSOR CHRISTISON, Vice-President, in the Chair.

Dr GRAHAM read "An account of an excursion to the West of Ireland," in which he was accompanied by some pupils and other friends.

The party arrived at Dublin on the 1st of August last, and proceeded next day by the Grand Canal to Ballinasloe, and thence to Galway, where they were joined by Mr Mackay and some friends from Dublin. From Galway they proceeded by Oughterard to Roundstone and Clifden, whence some of the party went to the Pins of Cunnamara, the rest to the Killeries, meeting two days after at Maam, when they examined part of the Maamturk mountains, and returned, by the route which they had before gone over, to Dublin on the 16th.

In the Canal, nearly from one extremity to the other, there was a profusion of *Sagittaria sagittifolia*, and *Sparganium natans*. *Orchis pyramidalis* was scattered along the banks, more abundantly westward, and in great profusion and beauty on the limestone soil near Galway. *Chlora perfoliata* occurred every where, but towards the western extremity of the Canal it became profuse. There were also observed in considerable quantities in the neighbourhood of the Canal, *Pulicaria dysenterica*, *Carduus tenuiflorus*, *Carlina vulgaris*, *Lysimachia vulgaris*, *Gymnadenia conopsea*; and more sparingly *Veronica Anagallis*, *Typha latifolia*, *Ænanthe fistulosa*, *Alisma ranunculoides*, and *Nasturtium terrestre*; *Ænanthe Phellandrium*, and *Sium latifolium* were abundant in a ditch near Shamon Harbour. *Carduus*

tenuiflorus and *Carlina vulgaris*, which in Scotland are generally sea-side plants, or occur only in the neighbourhood of rivers within the influence of the tides, were found quite in the interior of Ireland. On the shore near Galway were observed in great profusion, wild or completely naturalized, *Petroselinum sativum*, and almost as abundantly *Erodium moschatum*, and *Triticum lolialeum*; and *Polygonum Robertii* and *Beta maritima* very sparingly. Where the limestone rock cropped out, in the neighbourhood, were found *Asperula cynanchica*, *Euonymus europæus*, *Centaurea scabiosa*, *Sesleria cærulea*, and a white-flowered variety of *Gymnadenia conopsea*. *Fumaria capreolata* was found sparingly in a potato field near Galway, both with erect and deflected pedicels, or *F. media* and *F. capreolata* DC. On limestone walls at the Round Tower of Roscom were found, in extraordinary profusion, *Cotyledon Umbilicus* and *Grammitis Ceterach*, and subsequently, on the walls by the roadside between Galway and Oughterard. To the westward of Galway were gathered *Statice Limonium*, *Œnanthe pimpinelloides*, and *Scirpus glaucus* of E. B.; but the shore soon becomes granitic and extremely uninteresting. On the low rocky hills between that part of the shore and the lower end of Lough Corrib, was observed for the first time *Menziesia polifolia*; and from this point, throughout the whole route westward, it was seen daily, and often in great profusion, usually upon the low heaths by the road sides, and though it was also found a considerable way up the mountains, it was there much less abundant, much smaller, and very rarely flowers. *Eriocaulon septangulare* was noticed in great quantity, in several pieces of water to the westward of Galway, especially by the roadside near the lower end of Lough Corrib, and towards Half-way-house on the road from Oughterard to Clifden. In the swamps between the rocky hills already mentioned, and the lower end of Lough Corrib, were found *Carex limosa*, *Utricularia minor*, *Utricularia intermedia* (not in flower), *Pinguicula Lusitanica*, *Scutellaria minor*, and in great abundance *Rhynchospora alba*, *R. fusca*, and *Carex filiformis*. *Cladium Mariscus* was afterwards found, in much better condition, in pools towards Half-way-house; and *Rhynchospora fusca* in swamps by the roadside to the westward of Oughterard, and between Clifden and Roundstone. About half-way between

Galway and Oughterard, *Pimpinella magna* grows by the roadside in great abundance. Here it was ascertained, by going to the supposed discoverer of *Erica carnea*, that no such plant grows wild in Ireland. The report evidently had its origin in a mistake, and the species must be omitted from the British Flora. Near Clifden were seen *Bidens tripartita* and *Crithmum maritimum* sparingly. In the grounds at Clifden Castle grow *Valeriana Pyrenaica*, the hairy variety of *Saxifraga Geum*, and what is considered a white variety of *Vicia Cracca*, all evidently introduced. At Roundstone were found in considerable quantity, *Arabis ciliata*, *Senecio Jacobæa* without ray, and *Erica Mediterranea*; on one rock, very sparingly, small specimens of *Adiantum Capillus Veneris*, and by the roadside between Roundstone and Clifden abundance of *Erica Tetralix*, var. *Mackaiana*. Dr Graham remarked that he regretted being compelled to adhere to the opinion which he formed, when a specimen of this variety was sent to him at the time it was first discovered on the spot where it was gathered in this expedition. The small squat forms do look, on a superficial examination, to be distinct, but there is a remarkable lack of characters even in them, and they shade imperceptibly into larger forms, and these into the ordinary form of *E. Tetralix*. In fact, this is an extremely varying species, and a corymbose form which Dr Graham has gathered in each of the three kingdoms, has received from many quarters, and which he doubts not grows wherever the common form is found, in his opinion departs farther from the true specific type than *Erica Mackaiana* does. Mr Mackay deserves much more of Irish Botanists than a spurious name-son such as this. He has been the means of exciting great attention to native botany throughout the Island, and has himself greatly enriched the Irish Flora.

Upon turf over a mound of limestone gravel, by the side of Lough Corrib, and certainly far removed from any basaltic rock, were found many specimens of *Orobanche rubra*, and Mr Andrews, one of the party, found *Orobanche minor* at the Killeries. He also observed near the foot of Milrea Mountain, *Erica Mediterranea*, which is therefore now known to occupy three stations in Ireland.

Those of the mountains of Cunnamara which were examined,

were found unexpectedly barren of alpine vegetation. Scarcely a trace of even the most common alpine plants, which clothe the Scottish mountains, was seen among them. This seemed to be attributable to their formation, which in great part, from the summit downwards, is dry unproductive quartz. Near the base there is a narrow band of micaceous rock, and here, as is usual in such soil, alpine vegetation showed itself, but still only in sparing quantity. On the quartz nothing was observed worth notice, except abundance of *Saxifraga umbrosa* (certainly misnamed here), which was in full flower even to the tops of the mountains, where it often dwindled down to an inch in height, and yet was perhaps the tallest plant there. On the shores of a little lake to the westward of Half-way-house were gathered *Hymenophyllum Tunbridgense* and *H. Wilsoni* growing together. *Cnicus heterophyllus* has not yet been found in Ireland; but in precisely such situations as this species occupies in Scotland, *C. pratensis* was found from Shannon Harbour westward.

At Ochnanew Castle, near Oughterard, was gathered among the ruins *Calamintha vulgaris*, and by the roadside to the westward of Lough Rea *Nepeta Cataria*.

The PRESIDENT stated, that, in the middle of June last, he had received from Dr Christison a root of *Ipomœa purga*, now believed to be the plant which yields the true jalap of commerce; and that it had grown freely in the stove of the Botanic Garden. The root was received by Dr Christison from Dr Smyth Rogers of New York, who obtained it for him from Professor Wood of Philadelphia; and this gentleman received it, with several others which grew luxuriantly in his greenhouse, from Xalapa, through the kindness of Mr Burrows, American consul at Vera Cruz. Dr Wood's plants presented all the characters of the "True Jalap plant," first described by Dr Coxe of Philadelphia, in the American Journal of the Medical Sciences for February 1830, under the name of *Ipomœa Jalapa*, from specimens raised at Philadelphia, and obtained from Xalapa. The plant raised in the Botanic Garden of Edinburgh also presents the same characters, so far as they could be ascertained; but, owing to the root having been put

into the ground so late as the middle of June, only one or two flowers came to perfection, and no fruit formed. Its characters also corresponded very closely, but, like those of Dr Coxe's plant, did not altogether coincide with those of *Ipomæa purga* (Hayne), or *Ipomæa Schiedeana* (Nees von Esenbeck), described recently by various German botanists as the real source of true commercial jalap, on the authority of Schiede, a late botanical traveller in Mexico. The new plant is altogether different from that previously believed in Europe to yield the drug, and universally cultivated as its source in the stoves of this country. The evidence in favour of the new opinion seems quite conclusive.

Mr FORBES exhibited specimens of the true *Primula elatior* of Jacquin, gathered by him during the summer on the mountains of Styria. He pointed out the distinctions between these and the British specimens, and remarked, that they confirmed the views he had formerly laid before the Society (Bot. Soc. Proceedings, 12th April 1838), in which he maintained that no true *Primula elatior* has hitherto been found in Britain. He also laid before the Society some specimens of *Viola pinnata* from Mount Nanas in Carniola, in order to show that the form of the filamental appendages in that species, indicates a passage from the true violets to the pansies.

Thursday, December 13. 1838.

PROFESSOR GRAHAM, President, in the Chair.

M. ADRIAN DE JUSSIEU, F. L. S., Member of the Institute of France, Professor of Botany, Paris, was elected a Foreign Honorary Member of the Botanical Society.

Mr BRAND read a paper on the "Statistics of British Botany," the chief particulars of which are comprised in the following excerpts.

It having been objected to my scheme for arranging the Society's British Herbarium, that the districts into which I proposed

dividing the country would be too numerous for practical purposes, I was induced, with the view of obviating this objection, to attempt an abstract of the floras and catalogues embraced in Mr Watson's geographical work, in order to ascertain the comparative frequency of species, and thence to calculate the probable number of specimens that would be required for completing a herbarium on the plan suggested. Some rather unlooked for results having attended this inquiry, I was led to extend the investigation beyond my primary object, so as to obtain a general view of the statistics of British phænogamic botany.

Mr Watson has quoted, in his work, 12 *Local Floras*, and 19 *Catalogues*, all representing different localities, though these are frequently within the same county. The floras are generally more accurate and complete than the catalogues; but both are often very deficient, and sometimes difficult genera, such as *Salices*, *Rubi*, *Rosæ*, &c. are altogether wanting. The catalogues, however, have a wider range than the floras, but both united do not represent more than a half even of Great Britain; and Ireland, with the Channel Islands, were purposely excluded by Mr Watson from his calculations. There are likewise a considerable number of British species (234 in all) which are not located by him in any district,—some on account of their not occurring in the floras and catalogues from which he constructed his tables, others from an opinion which he entertained, that they ought not to be reckoned as British species, or had now ceased to be found in a wild state, and others because he regarded them only as varieties. I have endeavoured to ascertain the number of species excluded for these several reasons; and having restored them to a place in the flora, (as, for the Society's purposes, it was necessary to do), I have based my calculations on the supposition, that there are in Great Britain and Ireland (including the Channel Isles) all the 1578 species enumerated in the catalogue recently published by the Society.

It may here be mentioned, that there are also enumerated in that catalogue 58 species of *Filices*, and other cryptogamous plants,—but not possessing at present sufficient information respecting the distribution of these, and Mr Watson having ex-

perhaps indicate pretty nearly what will be the result of a more complete investigation respecting the range and frequency of species throughout the country.

II. TABLE *shewing the Number of Districts represented by the preceding Floras and Catalogues combined.*

Districts represented.	Represented by
2. England.	... { Catalogues . 1, 2 Flora . . . 3
4. ...	... Flora . . . 1
6. ...	... { Catalogues 3, 4, 5 Flora . . . 6
8. ...	... Flora . . . 4
9. ...	... { Catalogue . 8 Flora . . . 5
10. ...	... Catalogue . . 9
11. ...	... { Catalogues . 6, 7 Flora . . . 2
14. ..	... { Catalogue . 10 Flora . . . 7
15. ...	... Catalogues 11, 12
17. ...	... { Catalogue . 13 Flora . . . 8
19. ...	... Catalogue . . 14
1. Scotland.	... { Catalogue . 15 Flora . . . 9
3. ...	... Flora . . . 10
4. ...	... Floras . . . 11, 12
7. ...	... Catalogue . . 16
8. ...	... Catalogue . . 17
9. ...	... Catalogue . . 18
12. ...	(18.) Catalogue . . 19

From the above table, it will appear that the floras and catalogues together only represent 18 (or somewhat above one-third) of the 42 districts into which it is proposed to divide the country, —England and Scotland being rather more than one-half represented, and Ireland and the Channel Isles not at all. It may be remarked, also, that the space comprehended in these floras and catalogues is of very unequal magnitude, and that none of them represent *sufficiently* the districts, or even counties, to which they apply; on which account they do not afford adequate means for comparison with each other. This, however, conveys no imputation on Mr Watson's accuracy or diligence, for he has made the most of the materials which he possessed;

and, therefore, though his work may be imperfect, as not affording a *complete* index to the geographical distribution of British plants, it is not on that account the less creditable to his talents and industry. Had his Botanist's Guide embraced the *whole* species in each county, instead of the rarer species merely, I could have enlarged and corrected to some extent the lists deduced from his geographical work; but as it is, I must confine myself to these lists as they stand; and, accordingly, the following table is chiefly an abstract or condensation of them.

III. ABSTRACT of *Species contained in the 12 Floras and 19 Catalogues, combined with those Species which are wanting in either or both, but which are included in the Society's printed List or Catalogue.*

NUMBER OF SPECIES.			
In Floras.		In Catalogues.	
In all the 12 Floras	317 Sp.	In the 19 Catalogues.	78 Sp.
In 11 ...	102 add ^l .	In 18 ...	67 add ^l .
10 ...	72 ...	17 ...	56 ...
9 ...	67 ...	16 ...	51 ...
8 ...	63 ...	15 ...	53 ...
7 ...	64 ...	14 ...	46 ...
6 ...	75 ...	13 ...	47 ...
5 ...	68 ...	12 ...	54 ...
4 ...	68 ...	11 ...	48 ...
3 ...	70 ...	10 ...	50 ...
2 ...	98 ...	9 ...	51 ...
1 ...	156 ...	8 ...	51 ...
		7 ...	45 ...
		6 ...	65 ...
		5 ...	50 ...
		4 ...	57 ...
		3 ...	90 ...
		2 ...	115 ...
		1 ...	152 ...
	1220 Sp.		1226 Sp.
In 0 Flora, but 1 or more Catalogues .	94	In 0 Catalogue, but 1 or more Floras	88
In 0 Flora and 0 Catalogue, but in Society's List . . .	264	In 0 Catalogue and 0 Flora, but in Society's List . . .	264
	1578		1578
Add Filices, &c. in the Society's List	58	Add Filices, &c. in the Society's List	58
Total Species in the Society's Catalogue	1636	Total Species in the Society's Catalogue	1636

With regard to the species wanting in the floras, but contained in the catalogues, and *vice versa*, no remark is necessary,—but as respects the 264 species wanting in *both*, the following summary drawn up from an examination of the British Flora, and other sources of information, may serve to shew generally the causes of their omission, which have seldom been assigned by Mr Watson himself.

1. Of species included in Mr Watson's Lists, but not referred to any locality, being marked in his work (00),	159
2. Of species not noticed by him at all, but included in the Society's Catalogue, where I have marked them (0)	105
	264
Total omitted,	264

Whereof—

(1.) Rare alpine species, (about)	60
and recent additions to Flora,	30
	90
(2.) Doubtful natives, or species now seldom found in a wild state,	70
(3.) Doubtful species,	50
(4.) Species which are <i>varieties</i> of some authors,	24
(5.) Species which are peculiar to Ireland and the Channel Islands,	30
	264
Add Filices, Lycopodiaceæ, &c. &c. in Society's Catalogue,	58

The preceding table seems to shew that the tendency of species in Britain is to accumulate towards the extremes, as regards the *frequency* of their occurrence in the various districts represented; that is to say, many more species are common to *all* or *most* of the districts, or peculiar to only *one* or a *few* of them, than are common to the *intermediate numbers*, and this tendency (if I may use the expression) appears to follow a pretty uniform gradation of decrease and increase,—for the occasional deviations from that uniformity may, I think, be attributed chiefly to the greater or less extent of some of the districts relatively to others, and the greater or less completeness and accuracy of the lists contained in the respective floras or catalogues by which they are represented.

I am convinced, however, that the result of farther information and research, will be to alter considerably the scale of gra-

dation among species, as here exhibited, so far, at least, as regards the *relative proportion* of their frequency. That is to say, I think the result of matured investigation on this subject, will be to *diminish* the number of species believed to occur in only *one* district, or in *a few* districts, and to *increase* the numbers occurring in *all*, or *nearly* all of them,—the intermediate numbers of districts still continuing to hold much the same relation to one another as they exhibit at present.* Proceeding on this assumption, I have constructed the following table, for the purpose both of showing what may probably be the issue of a completed inquiry into the range and distribution of British phænogamic species, and of making an approximation with respect to the number of specimens which may be required for the formation of a herbarium on the principles which I have advocated. It is perhaps unnecessary to explain fully the *data* on which this calculation is based. They are chiefly those afforded by Mr Watson's work; but I have likewise taken into account a variety of other circumstances connected with the floras and catalogues, from which the information contained in that work has been derived. I may mention, also, that the number of species (200) fixed on as probably occurring in *all* the 42 districts into which I have proposed to divide the country, is not entirely conjectural, but is, in a great degree, supported by the result of a particular scrutiny among the species contained in the printed catalogue, instituted with the view of facilitating an interim arrangement of the Society's British Herbarium. The species considered by me to be in this condition amount to somewhat above 200, and those which probably occur in *nearly all* the districts, to about 100 more.

* The following Table may at first sight appear to be inconsistent with this principle, but the seeming inconsistency will vanish when it is considered that the districts proposed are greatly more numerous than those on which the preceding abstract is founded, and that a greater range of territory, and consequently an increased number of species, is included in them. From the first of these causes it necessarily results, that proportionally fewer species will be found *common to all* the districts; and from the second, that more species will be found *peculiar to one or other* of them. It must also be kept in view, that I am referring not so much to the *absolute number* of species occurring in any part of Britain, as to the *relative frequency* of their occurrence.

IV. TABLE showing the probable gradation in the numbers of Species occurring in the 42 Districts of Great Britain and Ireland, and the number of Specimens which, according to the same calculation, would be requisite to form a Herbarium on the scale proposed.

NUMBER OF					
Districts.	Species.	Specimens.	Districts.	Species.	Specimens.
In only 1	200 ...	200	In 42	200 ...*	600
2	80 add ^l .	160	41	80 add ^l .	3280
3	50 ...	150	40	50 ...	2000
4	40 ...	160	39	40 ...	1560
5	35 ..	175	38	35 ...	1330
6	32 ...	192	37	32 ...	1184
7	30 ...	210	36	30 ...	1080
8	28 ...	224	35	28 ...	980
9	27 ...	243	34	27 ...	918
10	26 ...	260	33	26 ...	858
11	25 ...	275	32	25 ...	800
12	24 ...	288	31	24 ...	744
13	23 ...	299	30	23 ...	690
14	23 ...	322	29	23 ...	667
15	22 ...	330	28	22 ...	616
16	22 ...	352	27	22 ...	594
17	21 .	357	26	21 ...	546
18	21 ...	378	25	21 ...	525
19	20 ...	380	24	20 ...	480
20	20 ...	400	23	20 ...	460
21	20 ...	420	22	20 ...	440
		<u>5775</u>			<u>20,392</u>
	<u>789</u>			<u>789</u>	<u>5775</u>
		Total,		<u>1578</u>	<u>26,167</u>
				Say for varieties,	<u>3833</u>
		Total number of Specimens requisite,—about			<u>30,000</u>

Thus it appears that, making a large allowance for varieties, &c., 30,000 specimens would be amply sufficient for completing a herbarium of British and Irish phænogamic plants on the principles suggested. Perhaps, indeed, a good many species might be deducted from the whole number of 1578 included in the Society's catalogue, as not now likely to be found in this

* Of plants which occur in *all* the districts it is proposed to take only one specimen from each of the three kingdoms.

country, in a wild state at least; but as those species, if met with at all, would probably be confined to one or a few districts, it seems needless to make any deduction on account of them.

Then, assuming that each sheet of the herbarium will contain 5 specimens on an average, this would require 6000 sheets in whole, or about four times as many as are requisite for a British herbarium of the ordinary description.

I trust these tables and calculations will suffice to demonstrate that the scheme proposed for the Society's herbarium is of a practicable nature, and not likely to be attended with more trouble or expense than would be compensated by the attainment of the several objects which it embraces.

Mr FORBES read an "Account of a three days' excursion to the mountains of Ternova in Carniola," made in company with Signor Tommasini of Trieste.*

They left Goritzia about the middle of June last, and proceeded to Chapovano, by way of Monte Santo, gathering the true *Athamanta Matthioli* on the banks of the Isonzo, with several other plants of much interest. At Chapovano they ascended the Stoddar, thence they proceeded through the forests to the mountain of Bodanowitz, and on the third day ascended the Golaks, the highest mountains of the chain, being about 5800 feet above the level of the sea. Among the plants collected during the excursion were, *Lilium carniolicum*, *Hieracium incarnatum*, *Campanula carnica* and *spicata*, *Cytisus angustifolius*, *Aquilegia Sternbergii*, *Polygala austriaca* (new to the district), *Polygala alpestris*, *Pleurospermum Golaka*, *Spartium radiatum*, *Paederota Agerea*, *Carex firma* and *tenuis*, *Euphorbia carniolica*, *Primula carniolica*, *Hacquetia Epipactis*, *Astrantia carniolica*, *Gentiana angulosa*, and many other species peculiar to those rarely-visited mountains.

Mr BRAND exhibited a specimen of *Carex leporina*, which he had found so long ago as 1830, during an excursion to the

* Published in the Annals of Natural History, vol. iv. p. 307.

mountains of Aberdeenshire, but which he only recognised to be that species on seeing the specimens lately discovered on Lochnagar.

Mr T. W. MORRISON exhibited specimens of the following plants from Cumberland and Westmoreland.

Epimedium alpinum, Wastwater, Cumberland.

Impatiens noli-me-tangere, Barron Wood, Westmoreland.

Rosa gracilis, Whinlater, near Keswick.

R. cinnamomea, Portinscale, near Keswick.

R. spinosissima, Castle Hill, near Keswick.

Thursday, January 10. 1839.

PROFESSOR GRAHAM, President, in the Chair.

A letter to the President was read, from his Excellency the Minister Resident and Plenipotentiary of the King of Saxony, intimating that his Majesty had been graciously pleased to acquiesce in the proposal of the Society to elect his Majesty a Foreign Honorary Member.

A copy of the letter follows.

To ROBERT GRAHAM, Esq.,
&c. &c. &c.

LONDON, 23 PARK STREET,
6th January 1839.

President of the Botanical Society.

SIR,—I have the honour to inform you that the commands of his Majesty the King of Saxony, my august master, enable me to declare his Majesty's most willing assent to his being elected an Honorary Member of the Botanic Society of Edinburgh, according to the Society's obliging intentions communicated to me in your honoured letter of 23d October last.

I have the honour to remain, Sir, your most obedient humble servant,

R. DE GERSDORFF,
Minister Resident of his Majesty the
King of Saxony.

On the suggestion of the Committee of Management, it was unanimously resolved, that, on the occasion of so exalted a per-

sonage joining the Society, the usual mode of election by ballot should be dispensed with.

His Majesty Frederick Augustus, King of Saxony, was accordingly elected a Foreign Honorary Member by acclamation.

The President, in congratulating the Society on the accession of the King of Saxony as an Honorary Member, stated that it was perhaps not generally known to British botanists, that his Majesty was no less distinguished as a successful cultivator of Botany, than as a zealous promoter and patron of the Science.

Mr HERBERT GIRAUD read the first part of a paper "On the Structure and Functions of Pollen." For the continuation and abstract of this paper see proceedings of next Meeting.

Mr FORBES read a paper "On certain Continental Plants allied to British Species."

Specimens were exhibited by Mr Forbes of the various plants alluded to in the course of his observations, chiefly collected by himself in Carniola. He noticed particularly the following.

1. *Rhinanthus hirsutus* of Lam.; *Rhinanthus Alectorolophus* of Koch; *Alectorolophus grandiflorus*, β . *pubens*, Wallroth. Distinguished from the true *R. major* (*Alectorolophus grandiflorus*, Wallroth) by the hairy calyx.

Species of Koch.

a. {	1. <i>R. minor</i> .	b. {	4. <i>R. major</i> .
	2. <i>R. angustifolius</i> .		5. <i>R. Alectorolophus</i> .
	3. <i>R. alpinus</i> .		

2. *Acinos villosus*, Pers. Distinguished from the *Acinos thymoides*, Moench (*A. vulgaris*, Pers.) by being hairy all over. A distinct variety, but no species.

3. *Ranunculus verrucosus*, Presl. Very near *R. bulbosus* and *R. hirsutus*. A species seldom seen. This is the true plant found near Trieste by Sternberg; elsewhere only found near Prague.

4. *Rubus tomentosus*, Borkhausen. Belongs to the same subsection as the British *R. Rhamnifolius*; is the *Rubus cuneosus* of Decandolle; and is considered by Koch as a variety of *Rubus fruticosus*.

5. *Polygonum Bellardi* of Allioni. "Erect, branches 3-flowered at each flexure, stipules ciliato-lacerate, nuts trigonal and punctate." Very near Adelsberg. Grows in Piedmont, Hungary, and Illyria.

P. Raii probably grows by the Adriatic.

Mr Forbes remarked, that the *Polygonum aviculare*, γ . *littorale* of Koch (*P. littorale* of Link), is not an uncommon British plant.

6. *Hieracium peleterianum* of Merat. Very near *H. pilosellæforme*. Long hairs distinguish it from that species, and the short stolons from *H. Pilosella*.

Thursday, February 14. 1839.

PROFESSOR GRAHAM, President, in the Chair.

MR HERBERT GIRAUD read the second part of his paper "On the Structure and Functions of Pollen."*

After describing the phenomena which are attendant on the development of Pollen in various tribes of plants, Mr Giraud pointed out some peculiarities which he had met with in the external configuration and internal structure of the mature pollen-grain, and shewed, that, from the former character, no correct indications could be deduced for determining the limits of certain groups of plants, as the figure and surface of the pollen-grain often differ widely even in individuals of the same genus. The existence of a third tunic, or investing membrane, was shown to occur in the pollen of *Crocus vernus*, and also the presence of minute opaque bodies on the surface of the pollen of *Polemonium cæruleum*, which, when immersed in water, appeared to be possessed of spontaneous motion. The true nature of the furrow which exists in certain spherical and elliptical pollen-grains was pointed out, and shown not to be a slit in the outer membrane, as is the opinion of some vegetable anatomists.

Mr Giraud then described the chemical composition of pollen, shewing the existence of potassa in the pollen of *Antirrhinum majus*; and of Raphides, consisting of phosphate of lime, mixed up with the pollen of *Tradescantia virginica*, and with that of certain species of *Orchidaceæ*.

* Published in the Magazine of Zoology and Botany, vol. iii. p. 399.

The effects produced by water, alcohol, ether, iodine, and sulphuric acid, on the physical conditions of pollen, were also adverted to.

The functions of pollen were then noticed, and the phenomena which are attendant on the performance of those functions, from the period when the pollen leaves the anther till its tubes arrive at the apex of the nucleus of the ovule. It was shown, that a somewhat elevated temperature is in many cases necessary for the development of the pollen tubes, and that this condition is supplied by the evolution of caloric, attendant on æstivation; and, lastly, the various provisions which exist for the preservation of the pollen from the deleterious effects of moisture were pointed out.

The paper was illustrated by drawings taken under the microscope.

Mr CAMPBELL communicated some "Notes on *Lychnis dioica*," by Mr WILLIAM GARDINER Junior of Dundee.

Mr Gardiner observes, that *Lychnis dioica*, α . *alba*, (*L. vespertina*, Sibth.) grows abundantly all along the north banks of the Tay from Arbroath to Invergowrie, a distance of more than twenty miles, while not a plant of *Lychnis dioica*, β . *rubra*, (*L. diurna*, Sibth.) is to be seen. On the south banks of the river, from Newport to Newburgh, *L. diurna* is very plentiful, and *L. vespertina* comparatively scarce. To the eastward of Arbroath, again, *L. diurna* is as common as *L. vespertina* is near Dundee. They seldom grow associated; and the var. *intermedia*, with rose-coloured flowers, is therefore very rarely to be met with. It was twice observed: first, in June 1834, at Invergowrie Bay, where *L. vespertina* abounds, but *L. diurna* is never found; and again, in July following, to the north of the woods of Baldovan, where, however, its presence was more easily accounted for, as the other two varieties were growing associated with it, all within the circumference of a yard.

At Ninewells near Dundee, in May 1836, Mr Gardiner found a plant of *L. vespertina* with hermaphrodite flowers, the stamina being of the usual size and number, but the pistilla much smaller. Specimens and seeds of this variety were presented.

Mr CAMPBELL also communicated some "Notes on *Primula vulgaris*, *elatior*, and *veris*," (of British authors), by Mr WILLIAM GARDINER Junior.

Mr Gardiner first alluded to *P. vulgaris*, from the Den of Mains near Dundee, where he had found the variety occasionally noticed as producing scapes with several flowers, and others with single flowers, both from the same root. Specimens of this variety were exhibited. *P. veris*, though mentioned in Hooker's British Flora to be rare in Scotland, was stated to be plentiful near Dundee. All along the south banks of the Tay it is peculiarly abundant; but on the north side it is more local, though plentiful where it does occur. The species supposed to be *P. elatior* is by far the rarest of the three, only a single specimen having been found near Balmerino in Fifeshire, where there likewise grew abundance of *P. veris* and *vulgaris*.

ANNIVERSARY MEETING.

Thursday, March 14. 1839.

Professor GRAHAM, President, in the Chair.

Mr JAMES M'NAB read an "Account of an excursion to Quaker Bridge, New Jersey, United States, during the autumn of 1834."

Mr M'Nab enumerated the different trees, shrubs, and herbaceous plants occurring in the district, and alluded particularly to the soils in which they were found. *Hudsonia ericoides*, a dwarf-growing shrub, which covers the white sandy plains in many parts of New Jersey, was met with abundantly, and was stated to resemble so closely the common ling (*Calluna vulgaris*), as to be not unfrequently mistaken for it when out of flower. It was remarked, that no district of America affords a richer harvest to the botanist than the neighbourhood of Quaker Bridge, for, within a space of fifty feet square, no less than thirty species of the most interesting plants may be obtained. Amongst these the following are chiefly conspicuous. *Drosera filiformis*, *Conostylis americana*, *Narthecium americanum*, *Eriocaulon decangulare*, *Hypericum Kalmianum*, *Sarracenia purpurea*, *Villarsia lacunosa*, *Nymphæa rosea*, *Pogonia ophioglossoides*, *Cymbidium pulchellum*,

Neottia cernua, *Saubatia paniculata*, *Polygala aurea* and *sanguinea*, *Utricularia cornuta* and *gibba*, *Xyris caroliniana*, *Hydrocotyle americana*, *Vaccinium oxycoccus*, *Gentiana angustifolia*, *Lycopodium alopecuroides* and *carolinianum*, *Bartonia tenella*, *Eupatorium hyssopifolium*, *Aster ledifolius*, *turbinatus*, &c., and many of the *Graminaceæ* not in flower.

The multitude of mosquitoes which infest the district proved a source of very great annoyance, and rendered it almost impossible to reap the rich harvest which was presented.

The PRESIDENT read the first part of a " Report on the Progress and State of Botany in Britain during the last twelve months."

An abridgment of the President's Report is prefixed to the Proceedings.

Thursday, April 11. 1839.

Dr J. H. BALFOUR in the Chair.

The following letter to the President, from the Secretary to the Prussian Legation, was read.

LONDON, *March* 18. 1839.

SIR,—In reply to your note of the 23d January, I have the honour to inform you that I have received the orders of his Majesty the King of Prussia respecting your desire to elect his Majesty an Honorary Member of the Botanical Society of Edinburgh.

I am now happy to be able to communicate to you, that his Majesty is willing to comply with that desire, and will with great pleasure see his name in the list of Honorary Members of your learned and distinguished Society.

I have the honour to be, Sir, your most obedient Servant,

BARON WERTHER,

Secretary of the Prussian Legation.

ROBERT GRAHAM, Esq. Professor of Botany in the University of Edinburgh, and President of the Botanical Society, Edinburgh.

His Majesty Frederick William III. King of Prussia, was accordingly elected a Foreign Honorary Member of the Botanical Society, by acclamation.

A valuable donation to the Library from Mr William Christy jun. was presented, for which the special thanks of the Society were directed to be given to him.

The PRESIDENT read the conclusion of his "Report on the Progress and State of Botany in Britain during the last twelve months," an abridgment of which is prefixed to the Proceedings.

The thanks of the Society were given to Dr Graham for the trouble which he had taken in preparing the present Report; and his permission was requested and obtained to print it along with the Society's Proceedings.

Mr BRAND read a communication from Mr GEORGE DICKIE of Aberdeen, "On the Vegetation of Davis' Straits."

In this paper the author suggested some inquiries, and noticed various circumstances of an interesting nature, connected with the range and distribution of species in that region. He remarked, that though the line of elevation of alpine plants descends as we proceed northwards, yet the descent of some species appears to be more rapid than that of others; and he believed it would generally be found that those species whose descent was most rapid had the least latitudinal range. The list of Davis' Straits plants, given by Mr Dickie, comprehended 52 species (all phænogamic except two), whereof about 20 are identical with British species. It appeared that 74 species of the same natural orders occur in Britain at an elevation of about 3000 feet or upwards; also that there is a close correspondence in both countries in the numbers belonging to each order. The prevailing species at Davis' Straits, both with respect to number and frequency, would seem to be those belonging to the following natural orders, viz. of Cruciferæ, 5; Caryophyllaceæ, 5; Rosaceæ, 3; Saxifragaceæ, 6; Ericaceæ, 6; Cyperaceæ, 3; and Graminaceæ, 5; which together contain 33 species out of the whole 52,—the remaining 19 belonging to 14

natural orders. The Davis' Straits species were generally smaller than corresponding British specimens. The predominating colour of the flowers was observed to be dark or pale yellow; flowers of a bluish colour being comparatively rare.

The plants collected were obtained chiefly in the months of June and July, when the flowers were fully expanded; but only one, viz. *Dryas integrifolia* had the seeds matured. They occurred between lat. 67° and 76° N., and were mostly found on the sea-shore; only three of them being peculiar to a more elevated locality, and that not exceeding 300 or 400 feet.

Mr CAMPBELL read a communication from Mr WM. GARDINER, jun. of Dundee, accompanying a specimen of Mucor, said to be new to the British Flora, which was found in the neighbourhood of Dundee in 1836, and is supposed by Sir William Hooker to be *Phycomyces splendens* of Fries, or perhaps the *Ulva nitens* of Agardh.

Mr THOMAS WOOD MORRISON laid before the Society engravings of some rare plants, splendidly figured, in Audubon's great work on North American Ornithology, viz. *Platanus racemosus*, from the Columbia River; *Cornus Nuttalli*, Columbia River; *Iris Cuprea*, Louisiana; *Nymphæa flava*, Florida. The President requested Mr Morrison to convey to Mr Audubon the thanks of the Society for his kindness, in allowing the engravings to be exhibited.

Mr FORBES read a second Paper "On certain Continental Plants allied to British Species." The following were particularly noticed, accompanied by the annexed observations.

1. *Silene Pseud-Otites*, Besser.

This is the *Silene Otites* of many southern botanists. It differs, however, from the true *S. Otites* in the form of its radical leaves (which are more elongated), in having the cauline leaves linear-oblong and patent, and in the calyces and peduncles being striated. The *Silene parviflora* of Ehrhart should

be united with it, differing as it does only in having the peduncles and petals pubescent. The specimens exhibited were gathered on the Monte Spaccato, near Trieste.

2. *Silene livida*, Willdenow.

A very near ally of *Silene nutans*. It differs in the capsule and the flower. The teeth of the former are recurved, the flower is always livid beneath. Although these characters seem at first sight insufficient, their permanency has induced most Continental botanists to regard it as a truly distinct species. It was found in the same locality as the *Silene Pseud-Otites*.

3. *Gentiana angulosa*, Bieberstein.

Nearly allied to *Gentiana verna*, and occupying its place in several of the most southern provinces of Germany. It is a very beautiful plant, adorning the mountain-meadows of Carniola with patches of the brightest blue. The flower is twice as large as that of *G. verna*, and the calyx has its angles more broadly winged, like the calyx of *G. utriculosa*. It is the *Gentiana æstiva* of Roemer and Shultz, and the *Gentiana verna*, β . *angulosa* of Wahlenberg. (Carp. Flor.).

4. *Plantago carinata*, Schrader.

This plant was gathered at Adelsberg in Carniola. It is found in several of the countries bordering on the Adriatic. It is allied to *Plantago maritima*, but differs in the indented leaves, and in the attenuated bracteæ, which are longer than the calyx. The first of these differences is, however, of no great importance, as ciliated leaves are found in the *Plantago maritima*, var. γ . *ciliata* of Koch, which is the *Plantago Wulfeni*, (M. et K.), and the *P. graminea* (Schleich) of some authors. Koch refers this plant to the *Plantago serpentina* of Lamarck, and considers the plant referred to that species by Reichenbach as *P. maritima*, γ . *ciliata*. It is possible all these forms may occur in our own country.

5. *Plantago altissima*, Jacquin.

Gathered in the marshes at Zaule, near Trieste. This is the *Plantago lanceolata* β . of Decandolle, *P. lanceolata*, β . *altissima* of Koch. Regarded as distinct by Reichenbach, who unites with it the *P. Schottii* of Schultz, and the *P. irrigua* of Fischer (which latter is the *P. Preslii* of Tenore). Easily distinguished from *P. lanceolata* by its great size, but by no less exceptionable character.

The comparative length of style and corolla is too variable in this section of *Plantago*, to be regarded as a basis of specific distinction. It may be regarded as a permanent variety of *Plantago lanceolata*, originating from its habitat in salt-marshes. It should be searched for in Britain. The *Plantago decumbens* of Reichenbach is another variety, which, doubtless, is frequent in this country, but which has still fewer claims to rank as a species.

6. *Holoschoenus australis*, Reich.—(*Scirpus australis*, Linn.)

A plant easily distinguished by its habit, and by its small heads of flowers, from the true *Scirpus Holoschoenus* (*Holoschoenus Linnæi*, Reich.) Koch, however, unites it with this species, to which he also joins the *H. exserens* and *H. filiformis* of Reichenbach. The latter author, nevertheless, seems to establish these various species on good grounds, and only follows the example of Linnæus himself. *H. australis* is a very rare plant; it was gathered by Mr Forbes near Trieste.

7. *Bupleurum protractum*, Link.

A rare plant from Istria, allied to, but very distinct from, *B. rotundifolium*. The resemblance lies only in the leaves and habit; in other respects it greatly differs.

8. *Lotus ciliatus*, Tenore. From Trieste.

This can scarcely be regarded otherwise than as a southern form of *Lotus corniculatus*. It is the *Lotus corniculatus* var. β . of Koch. Characters derived from the hairiness of the leaves, Mr Babington has well shown not to be specific in this genus, in his paper on the British species of the genus *Lotus* (*Annals of Nat. Hist.* vol. ii. p. 260); and unless we regard the longer calycine teeth as a permanent distinction, Mr Forbes suspects we must reject this species of Tenore.

9. *Onobrychis arenaria*. Kellebur.

Differs from *O. sativa* in its having linear-oblong canescent leaflets, and in the tothing of the legume. The plant is smaller, and the habit peculiar. From the neighbourhood of Trieste.

ADDENDA.

Loranthus europæus. Next genus to *Viscum*; parasitical on *Quercus austriaca* and *Q. pubescens* in the Southern Provinces of Austria.

Centaurea rupestris, Linn, and *C. adonidifolia*, Reich. 1. From Karst. 2. From Lipizza.

Gnaphalium hyperboreum, Don, from the Carniolian Alps. Mr Shuttleworth (Excursion to Valisian Alps, Mag. Zool. and Bot. ii. p. 193), gives it as a synonym of the *G. carpathicum*, Wahlenberg (*G. alpinum*, Gaudin). It is no way related to that species.

Delphinium hybridum, Willd.; (*D. fissum*, Kit.). From Lipizza.

Friday, May 10. 1839.

Dr R. K. GREVILLE, Vice-President, in the Chair.

Dr BALFOUR read a "Notice of some recent additions to the Edinburgh Flora." The following plants were particularly adverted to, and specimens from the various stations were exhibited, accompanied by the annexed remarks.

1. *Atriplex rosea*, Linn. *A. alba* of Reichenbach, in his Flora Excursoria, and *A. patula* var. β . of Smith, in his Flora Britannica.

It is allied to *A. laciniata*, and differs in the shape of the calyx of the fruit. In *A. laciniata*, this is three-lobed, two lateral lobes truncate, the intermediate one acute. In *A. rosea*, the enlarged fruit-bearing calyx is acute, dentated, and the back is covered with a double series of tubercles. In *A. laciniata*, the leaves are more sinuate, and not so deltoid, besides being mealy underneath.

This plant is considered by Mr Babington a truly distinct species. He picked it first in Guernsey, and he has since found it near Liverpool and Berwick, as well as at Newhaven, near Edinburgh. In this latter situation it grows abundantly, extending along the whole shore as far as Cramond, and probably farther. It appears to be an abundant plant on our coasts.

Specimens were exhibited by Dr Balfour from Granton, North Berwick, Bass Rock, Montrose, &c.

2. *Atriplex erecta*, Huds. Fl. Anglica β . *stricta*, Babington. In regard to this plant, Mr Babington remarks, that *A. erecta* of Hudson is only known by a single very imperfect specimen in the Smithian Herbarium, and which differs from the pre-

sent plant by having smaller fruit, and the enlarged calyces strongly tuberculated.

The present plant differs from *A. patula* and *A. angustifolia* (to which it is closely allied), by its densely-flowered compound spikes (those plants having long, simple, interrupted spikes). From *A. patula* it also differs in its smooth, shining, and much smaller seeds, as well as in having its lower leaves ovato-oblong, cuneate at the base, while the upper ones are lanceolate entire. From *A. angustifolia* it is likewise distinguished by its denticulated calyx, and the difference of habit.

It is found abundantly in fields close to the sea-shore at Granton, and seems to be a very common plant. Mr Babington picked it on Holy Island, and near Berwick.

3. *Rumex aquaticus*, Linn.

Distinguished by its large broadly-cordate petals, destitute of grains or tubercles. This plant was found by Dr Balfour in company with Prof. Graham, Mr Campbell, Mr M'Nab, and Mr Hunter, last September in ditches near Colzium House, about 15 or 16 miles from Edinburgh. The same party also found it abundantly near Cairns Castle Inn, on the Lanark road. In October last Dr Balfour found it plentifully near Pennycuick. It seems to be much more common than is generally supposed, and has been passed over by many botanists as being merely *R. crispus*.

4. A variety of *Rumex crispus*, Linn. Picked by Dr Graham and a party on the Bass Rock. The enlarged petals are each provided with an entire tubercle, and the whorls are mostly leafless.

5. *Thrinicia hirta*, Roth.

This plant was found in September last by Mr Campbell and a party with Dr Graham, near North Berwick, and also on Guillan Links.

6. *Equisetum variegatum*, Schleich.

This plant was also picked near North Berwick, by Dr Graham and party in September last.

7. *Equisetum Drummondii*, Hook.

Castle Campbell woods near Dollar, where it was first discovered by Dr Dewar.

8. *Ceratophyllum submersum*? Linn.

Linlithgow Loch, where it was found by Messrs Campbell, Bell, and Balfour.

9. *Potamogeton oblongus*, Viv.

Fruit rounded and obtuse on the back, whereas in *Potamogeton natans*, it is decidedly acute. The specimens exhibited were gathered by Dr Balfour, at Queensferry, four or five years ago. This species appears to have been confounded with *P. natans*.

10. *Epilobium roseum*, Schreb.

Distinguished by its clavate entire stigma, and by its stem not being distinctly 4 sided. This species was found by Dr Dewar, near St Davids, Fife.

11. *Lemna polyrhiza*, Linn.

Distinguished by the cluster of roots under each leaf. Duddingston Loch, near Edinburgh.

Mr R. W. FALCONER read a paper "On the Composition of Gooseberries at different periods of their growth," by Mr SAMUEL WRIGHT.

Mr WRIGHT examined the composition of Gooseberries at three different periods of their growth, viz., when unripe, when nearly ripe, and when quite ripe. From the several analysis Mr W. considers himself justified in the following conclusions. 1. That in the unripe state gooseberries consist chiefly of mucilage, lignin, malic acid and bitartrate of potass. 2. That when they have nearly arrived at maturity, they contain an abundance of sugar, its presence being attended with a diminution in the quantity of gum, part of this substance having been converted into sugar. 3. That when they are quite ripe, their components are more numerous than at any other time; sugar and alcohol being additional constituents to the unripe berries. 4. That after the period of their maturity is past, their composition again becomes simple, the only appreciable matters being lignin, mucilage, and acetic acid. The presence of alcohol in ripe fruit is considered by Mr Wright as rather a remarkable circumstance, and he thinks it not improbable that future investigations will detect alcohol in most fruits. Upon the presence of alcohol, Mr W. is inclined to believe the flavour of fruits depends—gooseberries, for instance, are not so sweet to the taste when they abound most in sugar, but when

this is existing in a very small proportion. From the mode of analysis, Mr W. does *not* consider that the alcohol could have been a *product* instead of an educt.

Dr GREVILLE read the following paper, being “ Directions for collecting Botanical Specimens, and preserving them for the Herbarium.”

Plants are preserved by placing them between sheets of absorbent paper, and then submitting them to pressure until they are quite dry. To *dry* plants is a very simple operation; and there are collectors who seem to think that, if all moisture is expelled, nothing more can reasonably be expected. This, however, is not sufficient for the purposes of science. The botanist must aim not only at retaining as much as possible the *character*, but the original beauty, of the plants he wishes to preserve. Continental botanists, especially the Germans, are celebrated for the beauty and completeness of their specimens; and the black, curtailed, and carelessly arranged *vegetable remains* which in this country are often dignified with the name of botanical specimens, are justly regarded by them as utterly worthless, and would equally be rejected by every one anxious to form a valuable collection. In order to contribute in some degree to improve our taste in this respect, the following rules have been drawn up; and botanists are assured that, by following them, they will preserve their specimens not only beautifully, but with facility and rapidity.

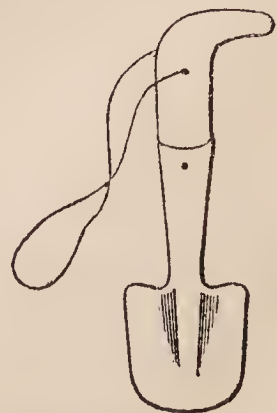
I. *Selection of Specimens.*

Specimens should be taken (when practicable) in fine weather, and free from external moisture. They should be in a perfect state of growth, their leaves and other parts uninjured. When, as is the case in some plants, the lower stem-leaves differ in shape from the upper ones, and the plant is too large to preserve entire, portions of the lower parts of the stem with the leaves, should be taken separately: if the root-leaves also differ, they, too, should be preserved. In some cases, it is important to have the young shoot with its fully developed leaves, as in the genus *Salix*, where the stipules are deciduous; and also

in the genus *Rubus*, where the leaves, &c. of the barren surculi are most characteristic. In short, it should always be borne in mind, that a *perfect specimen* of any plant includes every characteristic part. *Bad* specimens are always to be rejected, unless the plant is of great rarity. It should, indeed, be adopted as a canon by the botanical collector, that no specimen is to be admitted under the idea that it will *do for a duplicate*, if it would not *do for his own herbarium*; and I can scarcely imagine a botanist content to manufacture and store up in his own collection, such *vegetable remains* as have been already alluded to. Varieties are always interesting, as well as remarkable states and monstrosities, or deviations from the ordinary arrangement of any of the parts. In regard to the *size* of specimens, the best guide is the paper most generally used in good herbaria: this is about 17 by 10½ inches. No specimens should therefore exceed 16 inches in length by 9½ inches in breadth. Plants under this size should invariably have the root attached. It may be laid down as a general rule, that the entire plant should be taken, if, by a little management, it can be brought within the above-mentioned limits. Grasses, Carices, and plants of a slender habit, may be folded once or twice backwards and forwards, if necessary; and long slender Ferns, &c., may in this manner be preserved without mutilation. When it is inconvenient to obtain the root, the stem should be separated below the insertion of the root-leaves. The young collector is reminded, that specimens in fruit are to be selected as well as those in flower.

II. *Apparatus requisite for Collecting and Preserving Plants.*

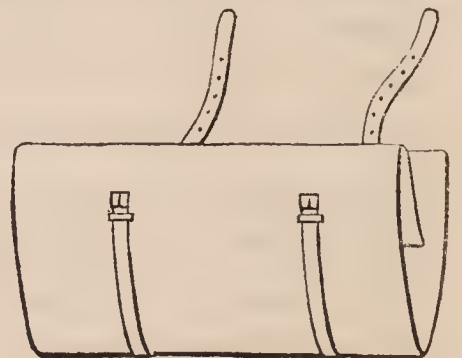
1. The *Digger*. This is a sort of trowel, which will be better understood by the annexed cut than by description. The whole instrument is 7 or 8 inches long; the spud 2½ inches long, 2½ inches wide at the top, narrowing gradually to 2 inches at the bottom, and having the lower angles slightly rounded. It should be made sufficiently strong, to resist considerable force in digging out plants from the crevices of rocks, &c.



2. The *Vasculum* or *Botanical Box*. The diligent collector will find it convenient to have his boxes of two or three sizes. One of them should be small enough for the pocket, and is very useful for the reception of small and delicate plants, and such objects as demand peculiar care. The principal vasculum, for distinction's sake, we call the *Magnum*. It should not be less than 20 inches long, 8 or 9 inches wide, and 5 inches deep, having a strong handle at one end. The form most strongly recommended is that exhibited in the annexed figure; in which it will be perceived, that the upper surface, with the lid, is convex, the curve being similar to that of the under surface. The *Magnum* is, of course, only required on excursions when a considerable number of specimens are desired. On such occasions, it is indispensable, if the collector wishes to bring home his plants in a satisfactory state. In boxes intended for the pocket, and in them only, the common concave form of the lid may be retained with advantage.



3. The *Field-Book*. This may be carried or not, according to circumstances. It may be made of any size, from that of a large pocket-book to a folio, and is in fact nothing more than a portfolio, containing a quantity of absorbent paper, temporary pressure being given by a couple of straps. To the inner edge of one side is attached a piece of oiled silk, as well as to each end, which serves to keep the paper dry in case of rain. If the field-book is of a quarto or folio size, it may be slung over the shoulder by a strap, on the side unoccupied by the vasculum. The great use of such a book is, that plants having very deciduous flowers, *Veronica saxatilis* for example, may be at once exposed to some degree of pressure. Some plants also, whose corollas close almost immediately after being gathered, such as those of the different species of *Erythræa*, can only be preserved in their beauty by being placed in paper on the spot. In a long day's excursion, where the harvest is likely to be abundant, the field-book will be found extremely useful.



4. *Paper.* The best paper for the process of drying plants is a kind known by the name of *Demy grey*, with a tolerably smooth surface, 18 inches long by 11 inches broad, which is the size found by experience to be most convenient, not only for the resident but the travelling botanist. It may be purchased for seven or eight shillings per ream, and is preferable to common blotting paper, in being very much cheaper, far more durable, and in drying more rapidly after having been used,—a point of considerable importance, especially on botanical excursions, when large quantities have to be dried daily, and sometimes under very disadvantageous circumstances. This is the kind of paper which has been used for many years by Gr Graham, and his friends and students, in their excursions among the Highlands of Scotland; and it may be mentioned in this place, that some of the private friends of the Professor, who are certainly the most active collectors in Scotland, have accompanied him on most of his annual excursions; and that, as it was highly desirable to reduce the labour of collecting and preserving to the *minimum*, every experiment has been tried, both as regards the quality and size of paper, and all the little details of the process of desiccation, the sum of which affects in no small degree the *comfort* and *success* of such expeditions. Some of the excursions alluded to were really the pursuit of plants under difficulties. A limited quantity of *very thin* white paper, of the same size as that described above, will be found useful in preserving some plants, which become soft and flaccid during the process of drying, and which cannot be transferred from one sheet of paper to another without injury. The corolla of *Viola lutea*, for example, collapses, if removed in the ordinary way, after a day's pressure. By placing such plants at first *within* the sheet of thin paper, the whole sheet, plants and all, can be moved when the drying paper requires to be changed, without their being disturbed.

5. *Boards.* Two kinds of boards must be procured, both of which should be exactly the size of the paper, or, at most, a quarter of an inch larger each way. Two of the boards should be double ones, half or three-quarters of an inch thick; each double board being composed of two thin ones, the grain of the one crossing that of the other, firmly glued together, and fur-

ther secured by small screws along the edge, at intervals of three inches: the rest of the boards, say eight in number, should be three-eighths of an inch thick. These ten boards form a *set*, and will serve for a couple of reams of paper. If the collector is active, he will require several sets of boards, and paper in proportion. In order to shew what *may* be done, and *well* done, by judicious arrangement, it may be mentioned, that, in an excursion made in the autumn of 1837, by Dr Balfour, Mr Brand, and myself, to the mountains of Forfarshire and Aberdeenshire, chiefly for the purpose of collecting for the Botanical Society, we took with us about twenty reams of paper, the whole of which was brought into use before the time allotted to the excursion (three weeks) had expired; and during this period, about 15,000 specimens rewarded our exertions. A few sheets of stout pasteboard will be found very convenient for separating the specimens and for packing them as they become dry; particularly in preventing woody plants, &c., from injuring those placed above and below them.

6. *Press.* Some botanists employ screw or other presses. A preferable and simpler plan is to use common iron weights, or a squared stone having an iron ring fixed in the centre. By this means, the pressure is never relaxed, as is the case with the screw-press. In preserving *bulky* plants, it is sometimes difficult to equalize the pressure. Paper folded to the required thickness, and placed on each side of the stem, is frequently sufficient for the purpose. In more difficult cases, a sand-bag or two, of the size of the paper, may be used with advantage. In travelling, each parcel of paper containing plants must be secured by three strong straps, a double board being placed above and below, and in this way a considerable degree of pressure may be obtained. When the botanist is stationary for several days on an excursion, or even resting for a single night, no better resource can be desired than a few heavy stones. A weight of 100 lb. will not be too much to place upon each parcel.

A pair of common surgeon's forceps are very useful in removing small plants from one sheet of paper to another. A second pair, as well as an extra knife, will be provided by the experienced traveller, in case of accidents. If an excursion of some days is contemplated, a good supply of strong cord, and

several spare straps, should not be omitted; and every parcel of paper should be completely enveloped in oil-cloth (before the boards are strapped on), to prevent the paper or its contents from being injured by wet.

The botanist being now provided with his *materièl*, I shall suppose him to have commenced a ramble of a few days. He has already been tempted to deposit some fine specimens of very common plants in his vasculum; but let not this provoke a smile, for it is not a bad rule to take even a very common plant, when a *remarkably* fine or beautiful specimen presents itself. But as our botanist has commenced operations, I shall now address myself to him, and offer a few hints for his guidance. Be very particular in the first place, in the choice of specimens: put nothing into your box that is not good of its kind. Let the specimens be the proper size for preserving, and dispose them carefully so as not to injure each other. Clean the roots before you place them in the box, and wash those which have been gathered in muddy places. If you have been very successful, and your box begins to shew symptoms of repletion, sit down and revise its contents; throw away the inferior things, and retain nothing but what is really worth preserving. You will thus bring home your collection in a good state; although you may have, perchance, (no uncommon thing in the Scottish Highlands), to walk a dozen miles to your quarters. If the sun is very powerful, cover your specimens with a few large leaves, or even a little grass, and sprinkle a few drops of water over them. Nothing is more injurious to the beauty of plants, than the cramming system of voracious and indiscriminate collectors. I have seen a heavy vasculum brought under a burning sun from a distant mountain, and after every tolerable specimen was removed, contain a mass of *rejectamenta* that would have reflected discredit on a whole party. Having returned with your treasures, you will be anxious to commit them to paper, and I hasten to give you the necessary directions. Provide yourself with a number of slips of paper, 2 inches long by 1 inch broad, with a slit half an inch in length cut in the centre, and have your knife and forceps at hand. Place now half a dozen sheets of paper upon

one of the double boards, and proceed to lay out your specimens ; one or more on the same sheet, according to their size. It is not desirable that the branches, leaves, &c., should be *artificially* displayed : separate them slightly, if they require it, and take care that the parts are not unnaturally bent or folded. Long slender plants, however, that require to be folded, must have the folded extremity passed through the slit of one of the paper slips, which will keep the parts in their proper position. Lay down your specimens (as a general rule) with their roots towards you, and as you place five or six sheets of paper upon them, arrange the leaves, &c., with your hand or the forceps, and then proceed with other specimens, until you have a dozen or more sheets of them arranged. Cover them, then, with one of the thin boards, and begin another series, and so on until all your plants are secured. Place the other double board upon the top, and submit the whole to pressure. The above directions are sufficient for the preservation of most plants : there are some, however, which demand particular treatment. If the specimens are woody, or very thick in the stem, a slice can often be taken from the back without affecting the character of the plant : a portion of the plant may be removed if it is densely tufted ; and some of the branches of the back in such plants as *Hippophæe rhamnoides*, *Prunus spinosa*, &c. Robust plants that yield but slightly to pressure, *Statice Armeria* for example, and others which do not yield *at first* to pressure, require a thin board to be placed between every sheet of specimens. The stone-crop tribe must be plunged for some minutes into boiling-hot water, and then pressed between coarse napkins until the external moisture be removed, before they are committed to paper : unless this be done, the plants will live for a month under pressure, and the leaves die and fall off by degrees. Aquatic plants should also be freed from external moisture by means of napkins, and the same plan may be advantageously resorted to when specimens are collected in wet weather, which is sometimes inevitable. Orchideous plants must be subjected to great pressure, and ought to be dried very rapidly : scarify the back of the stem and the midrib on the back of each leaf with a knife, in order that the juice of the plant may have an outlet by which to escape : separate the flowers also, by insert-

ing small pieces of paper between them. When plants have large and delicate corollas, place a piece of thin paper, somewhat larger than the corolla, above and below it, to remain until the specimens are dry. The quantity of paper to be placed between each sheet of specimens will vary according to circumstances. For plants of a thin texture, and containing little moisture, five or six sheets are sufficient; but more is necessary for succulent kinds, for aquatic plants, and for plants in general, when gathered in wet weather; likewise for woody and robust specimens.

In regard to the frequency with which the paper ought to be changed, this, for ordinary plants, is a *daily* operation, and ought on no account to be omitted, until they are very nearly dry. Aquatic and very succulent plants should be transferred to dry paper twice a-day; and the species of *Sedum*, &c., which have been plunged into hot water, several times during the first and second days, as the moisture is given out very rapidly. Change the paper in which orchideous plants are drying twice a-day, and let it also be well heated. If you are stationary, and have plenty of paper, slender plants, like many of the Grasses, &c., and others containing very little moisture, like *Myosotis collina* and *versicolor*, &c., may be allowed to remain in the paper after having received a single change, until they are dry, two or three extra sheets being placed between the specimens. In giving your specimens their first change of paper, you will not omit to rectify any mistake in their disposition, and place those leaves right that have been accidentally folded, &c.

On the second day of your excursion, you will have a quantity of damp paper on your hands. In some places it is easy enough to get it dried, but in the little inns of mountainous districts, the difficulty of getting several reams of damp paper dried *daily*, at first sight appears insurmountable. Nothing, however, is more readily effected, provided you wait upon yourself. Having brought a roll of thick cord (and a score of strong nails in case they should be wanted), fix one end of the cord to the roof of the *kitchen*, and carry it backwards and forwards along the roof as many turns as you require. Hang your paper on these ropes in parcels of a few sheets before you leave your quarters in the morning, and by the time you want them in the

evening they will be thoroughly dry. Another set may be dried during the night.

As the plants become dry, they may be arranged close together, but so as not to touch each other, on single sheets of perfectly dry paper, and kept in parcels by themselves. When a considerable number of plants are in process of drying, those in the different stages of the process should be kept apart from each other, in order that the desiccation of the more advanced specimens may not be retarded by the juxtaposition of those more recently collected.

Invariably attach labels to your specimens, mentioning the particular station, the date of collection, elevation above the sea (as nearly as it can be estimated), the geological formation of the locality, and any additional information that may be interesting.

I have one other point to notice, and if your excursion is to last a week or more, it is of great importance, and equally applicable whether you are alone or form one of a party. It is very easy to visit a number of localities, and to collect a vast number of plants; but if you wish to exhibit the fruits of your labour, and not to be ashamed of them, you must from time to time suspend the labour of collecting. Unless there be some fixed rule of this kind, you will find little comfort or satisfaction in your exertions. You may sit up (as has been often done) night after night, and deprive yourself of that rest which is absolutely necessary, and after all be unable to preserve your plants with proper care. You will soon find, if you are a diligent collector, that your labour increases for some days in a sort of geometrical ratio. Half a day, therefore, *at least*, in the middle of the week, say the morning of every Wednesday till two o'clock, should be appropriated to the preservation and arrangement of your plants; and a part, or the whole (according to circumstances), of every Saturday should *invariably* be set apart for the same purpose, in order that they may not be injured by remaining untouched on the Lord's Day.

Many Cryptogamous plants do not necessarily require the same care when first collected as those about which I have been speaking, as they can be relaxed by moisture and prepared at any subsequent period. They will, perhaps, lose some-

what of their original bright colour ; but this is of trifling importance, if the great saving of time to the collector, especially in foreign countries, be considered.

Mosses and *Hepaticæ* may be gathered in tufts, or masses of considerable size, always selecting such as are in fructification. If the stems or roots are loaded with mud or soil, they should be well washed. The tufts are then to be placed between sheets of coarse paper, and dried under a moderate pressure, after which they may be packed like other plants. In subsequently preparing specimens for the herbarium, a greater pressure will be required.

Lichens may be treated like mosses, at least such kinds as admit of pressure. Those species which form a close crust on rocks, trunks of trees, &c., and which can only be obtained along with a portion of the substance on which they grow, should be wrapped separately in paper, like minerals, and packed into a box.

Algæ or *Sea-weeds* are preserved in a rough state with much facility, and, on account of the increasing interest which attaches to them, should be assiduously collected in foreign countries, especially in the southern hemisphere. They should be taken, if possible, with the root, and will often be found in the highest state of perfection thrown on shore by the tide. All kinds should be taken, from the smallest, to the largest manageable size ; avoiding those specimens which are battered, or in a state of decomposition. Spread them on the ground, or in an outhouse, to dry, without washing them in fresh water, in fact just as they are gathered ; and when they are quite dry, pack them without pressure into a box, mixing a few small branches with them, to prevent them from being pressed too much together, in case of damp on the voyage.*

The thanks of the Society were given to Dr Greville for his valuable paper, and his permission was obtained to print it, for circulation among the Members and Correspondents of the Society.

* Some useful directions for preserving sea-plants for the *herbarium*, will be found in the Magazine of Zoology and Botany, vol. ii. p. 144, by Dr Drummond. It may be added in this place, that the larger olivaceous species should be put into boiling-hot water until the mucus be all given out, and then wiped with coarse napkins before they are committed to paper.

Thursday, June 13. 1839.

PROFESSOR GRAHAM, President, in the Chair.

MR BRAND submitted to the Meeting an interim Catalogue for the Society's British Phænogamic Herbarium, ruled with columns corresponding to the forty-two districts into which he had divided Great Britain and Ireland, with the adjacent Islands, intended to exhibit, by marks inserted in the respective columns, the districts from which specimens of each plant had been obtained. The Catalogue met with the entire approbation of the Members present, and the thanks of the Society were given to Mr Brand for the very great amount of labour which he had bestowed in its preparation, and in regard to the arrangement of the Herbarium.

Mr Brand then suggested that a similar plan should be commenced, and followed out for the arrangement of the Society's General Herbarium, as a preliminary to which, he proposed that the different countries and states throughout the world should be so grouped and arranged as to form about one hundred sections or districts. He stated his intention of framing such a table and map as would enable him to explain his views more fully at next meeting of the Society.

The PRESIDENT exhibited the following plants in flower, grown in the Botanic Garden.

1. *Anadenia Manglesii*. A new species of this genus,—only one representative of it having been hitherto in cultivation. It had been sent to the Botanic Garden under the name of *Grevillea Manglesii*. It was stated that a description of it would appear in next number of the Edinburgh Philosophical Journal.

2. *Grevillea ferruginea*. A species introduced into cultivation in 1837.

3. *Pimelea decussata*, var *diosmæfolia*. This plant had been sent from Liège, and considered specifically distinct from *P. decussata*; but, on careful examination, Dr Graham found it

impossible to remove it from that very varying species. It was evidently intermediate between *P. decussata* and *P. Hendersonii*, and threw considerable doubt over the title of the latter to rank as a species.

4. *Nerium oleander*, flore albo.

5. *Ipomæa purga*. This has been stated, at p. 57, to be the plant now known to yield the officinal jalap, and is altogether different in its character and appearance from the *Convolvulus Jalapa*.

6. *Fuchsia fulgens*. Two specimens of this very magnificent plant were in great beauty, the one from the greenhouse, the other from a cool stove.

The PRESIDENT read a paper entitled "Description of a Plant-Case, or Portable Conservatory for growing Plants, without fresh supplies of Water or of Air, according to the method of N. B. Ward, Esq.; with Physiological Remarks;" by Mr DANIEL ELLIS.*

Of this paper, the following is an abstract prepared by the author.

Mr Ellis exhibited to the Society a Plant-case or Conservatory, constructed for him, according to the design, and under the direction of Mr James M'Nab, for growing plants in close cases, without fresh supplies of water or air. He detailed the mode in which the case was constructed, and described the preparation of the soil, and method of planting; giving also a list of the plants put into the case in May 1838, with remarks on their appearance and growth, by Mr M'Nab, in May 1839. The case itself was much admired, as forming an elegant article of drawing-room furniture; and the appearance and growth of the plants were deemed highly satisfactory.

Mr Ellis next adverted to Mr Ward's early taste for botanical pursuits, and his inability to indulge it, from the impossibility of growing plants in the smoky atmosphere in which he resided. This vitiated condition of the atmosphere was shewn to arise, not from the diffusion of fuliginous matter through it,

* Published in the Gardener's Magazine, vol. xv. p. 481.

as is commonly supposed, but from the presence of sulphurous, or other acid gas, generated in the combustion of coal, or in certain processes of manufacture, as established by the experiments of the late Dr Turner and Professor Christison.

Mr Ward's fortunate discovery of the means of counteracting this noxious operation of the air on plants, was then referred to. From a small portion of moist earth, in which the cypselis of an insect had been placed to undergo the process of transformation, a young plant or two was observed to shoot. These were attentively watched by Mr Ward; and, after the insect which came forth was removed, the bottle, containing the mould and young plants, covered by a tin lid, was placed outside the window. There it remained for a long time, during which the plants continued to grow well, without receiving directly any fresh supply of water or of air. It was by his sagacious observation of this fact, and his zeal in instituting experiments to confirm it, that Mr Ward has succeeded in inventing an apparatus, in which he is enabled to grow plants in situations and circumstances where they could not before vegetate; to associate together in growth plants of every clime, and of the most opposite characters; and to transport, at a very easy rate, and with scarcely any risk or trouble, through every gradation of temperature, the most rare and delicate plants of one country in exchange for those of another. The general principles on which these results depend, are in part stated by Mr Ward. It was Mr Ellis's aim to give them greater extension; and especially to seek, in the varied changes which vegetables exert on the atmosphere in which they grow, the means which they possess of maintaining it always in a nearly uniform state of composition and purity.

In prosecuting this investigation, Mr Ellis considered in succession the operation of the several agents concerned in vegetation,—namely, water, heat, light, and air,—comparing the effects naturally produced on them by plants in the free atmosphere, with those which must occur in the close cases of Mr Ward.

In the free atmosphere, the water absorbed from the earth by the roots of plants, is in great part exhaled by the leaves, and dissipated. In the cases of Mr Ward, it is also absorbed

by the roots from the soil, or by the leaves from the atmosphere, and is in like manner partly exhaled; but, instead of being dissipated, it is condensed on the glass roof of the apparatus, and falls back to the soil from which it was raised. In this manner, the same portion of water, which was originally given to the soil, is made to contribute over and over again to the growth of the same plants; and as comparatively little waste of that fluid occurs, vegetation may be sustained by it for long periods, without the necessity of any fresh supply.

A certain temperature is, we know, essential to the existence of vegetation; but different degrees of temperature are suited to different plants. Hence plants acquire habits suited to the climate in which they have been reared; and therefore, in the free atmosphere, it is difficult and sometimes impracticable to grow them in other climes. In the cases of Mr Ward, however, plants of tropical, temperate, and frigid climes are all planted and reared together; and in their transportation from one country to another are made to pass, without apparent injury, through degrees of temperature varying from 15° or 30° *below* the freezing point, to more than 120° *above* it. This capacity of bearing such extremes of temperature is ascribed by Mr Ward to the almost perfect *stillness* of the atmosphere within the glazed cases. In proof of this, he refers to the very high degrees of heat which the human body is able to bear in close chambers, as shewn in the well known experiments of Fordyce and Blagden; and the low temperatures, even to that of freezing mercury, which it sustains, without inconvenience, in the open atmosphere of the arctic regions, when the air is perfectly calm and still. Even a slight degree of wind is equivalent to a reduction of several degrees of heat, and a stiff breeze rapidly lowers the temperature of many bodies with which it comes in contact, 40° or 50° . Against such great extremes and rapid transitions of temperature the plants, confined in the glazed cases of Mr Ward, are to a certain extent protected; and even when they do occur, the change is made in a manner so gradual as to provide, in a great measure, against its injurious operation.

With respect to light, Mr Ward declares that its free admission to all parts of the plant case is essential to the success of his plan. In support of this opinion, Mr Ellis detailed the ge-

neral operation of light on growing plants, ascribing to its agency the colour, odour, taste, and other distinguishing properties which different plants display. He maintained also, that the action of light was *exterior* and *local*, affecting only those parts of the plant to which it had direct access; and that the ordinary effects which it produces may be suspended, or withdrawn from the whole, or any part, of the plant, by more or less completely excluding the light. Of this opinion many striking examples were given; and the modes employed by practical gardeners in effecting *etiolation* were referred to as illustrations of the effects produced by the partial or total exclusion of light. It was then stated that light acted especially on the matter called *chromule*, which is contained in the cells of the parenchyme of the leaf, in the petals of flowers, and in some other parts. By chemical agencies which, in this brief abstract, we cannot venture to detail, this chromule is made to assume different colours in different parts. In the leaf, it takes on a green colour, which is reflected through the epidermis; and thus clothes our fields in that livery of green which of all colours is the most refreshing to the sight, and which the eye never tires to behold.

But the influence of light on vegetables is not limited to the production of colour and certain other active properties. It exerts a remarkable operation on the composition of the surrounding atmosphere, when it acts in conjunction with plants, confined in close vessels of air. It is generally admitted that seeds, during their germination, convert the oxygen gas of the air into an equal volume of carbonic acid gas: and, from the experiments of various authors, Mr Ellis maintained that plants also, during their vegetation, act precisely in the same manner in deteriorating the air. The evolution of the seed is carried on beneath the soil by the agency of the air alone; but the moment the germ pushes forth into day, it is exposed to the agency of light as well as of air, and then it not only acquires new properties, but exerts a new influence on the composition of the air. This particular influence was first noticed by Priestley, who found that air, which had been rendered foul by animal respiration or combustion, recovered its former purity by the agency of plants, when exposed to the direct rays of the sun.

The results of the experiments of Ingenhousz, Senebier, and Theod. de Saussure, fully confirmed and greatly extended this curious and important fact. They shewed that the presence of carbonic acid gas was necessary to this purification of the atmosphere; that it arose directly from the decomposition of that gas, and that the volume of oxygen produced was equal to that of carbonic gas previously existing in the air. If an *artificial* atmosphere, containing an excess of carbonic acid, was employed, then a corresponding *excess* of oxygen gas was found in the residual air. If, on the contrary, a portion of the carbonic acid, naturally formed by vegetation, was abstracted from the atmosphere, then a corresponding *deficiency* of oxygen was detected in it. It was farther found that neither the plant alone, nor light alone, was able to decompose carbonic acid gas; but that its decomposition was readily effected by the concurring agency of both.

In perfect conformity with the foregoing facts, M. de Saussure ascertained, by numerous experiments, that if plants, growing in glass vessels of air, were kept in the shade, they converted the oxygen gas of the air into carbonic acid gas; but, if the vessels with the plants were then exposed for a few hours to bright sunshine, the air, when analysed, was found to possess its original composition, both in regard to purity and volume. In the opinion of M. de Saussure, plants not only deteriorate the air by their growth in the shade, but also in sunshine; and the reason why it cannot then be so readily detected is, because the carbonic acid, formed by the vegetative process, is at once decomposed by the combined action of the plant and light. Hence in all the analyses of air, which had served the process of vegetation under a due exposure to light, no permanent change was observed either in its purity or its volume.

These experiments of De Saussure were continued for many days together, during which the plants continued to grow; and, nevertheless, the air possessed always its original composition in regard both to purity and volume; so that the consumption of oxygen gas by vegetation in the shade was exactly counterbalanced by the decomposition of carbonic acid gas in sunshine; and hence, amidst the vicissitudes of perpetual change, the air was maintained always in a nearly uniform state of composition and purity.

Applying these views to the state of the air in the glazed cases of Mr Ward, Mr Ellis considered that no difficulty could arise in comprehending the mode in which the air was preserved in a condition fitted to carry on the vegetation of the plants within them. The deterioration effected in it while the process was conducted in the shade, would be counteracted by the purifying process set up under exposure to the light of the sun; and thus the same volume of air, by alternate exposure to sunshine and shade, like the same volume of water, by successive absorption, exhalation, and condensation, is made to serve, over and over again, in carrying on the vegetation of the same plants for an indefinite period of time. In this manner, the apparatus of Mr Ward must be regarded as a mode of growing plants on a large scale, which the experiments of De Saussure, on a smaller one, had long before shewn to be practicable.

The President was requested to thank Mr Ellis for his very valuable and interesting paper; and he was likewise requested to state the anxious wish of the Society that Mr Ellis might be prevailed upon to prepare a second edition of his work on Physiology, which has now been so long entirely out of print.

Mr JAMES M'NAB read a communication from Mr ALLAN A. MACONOCHIE, "On the Use of Glass Cases for rearing Plants, similar to those recommended by N. B. Ward, Esq.," in which the following statements were contained.

Mr Maconochie mentioned that, for upwards of fourteen years, he had practised a mode of "window gardening," in glass cases very similar to those employed by Mr Ward, and that during that period he had made many observations regarding the growth of various species of plants, when treated in so artificial a manner. He stated that, although it was well known to many of his personal friends and acquaintances, that he had had a glass case of the above description for more than fourteen years, still he had no wish to detract from Mr Ward the merit of also having made the discovery, or that of having first made it known to the public. Mr Maconochie then mentioned that, it was while considering the experiments of De Saussure on the respiration of plants, together with Humboldt's observations on a plant of

Fucus vitifolius found growing and preserving its usual colour at an immense depth in the ocean, where the light must have been less than a hundredth part of that afforded by a common candle, viewed from the distance of a quarter of a mile, that the idea struck him that plants, whose habitats afforded them decomposed light only, might, if supplied with soil and moisture, vegetate in a confined atmosphere, and in a light more or less decomposed by the refraction of two surfaces of window glass.

The first experiment made by Mr Maconochie was, inclosing several exotic Ferns and Lycopodiums, obtained from the Glasgow Botanic Garden, and planted in peat earth, in a large glass vessel used for keeping golden-fish. The success of this first essay induced him to get a glazed case, or "Miniature Greenhouse," made by a country carpenter; and, of the plants which were found to grow most luxuriantly in its confinement, it was stated that none surpassed the *Hoya carnososa*; the whole tribe of Cypripediums, and Trilliums; nearly all Ferns and Lycopodiums; several Euphorbias; and the Melocacti.

Thursday, July 11. 1839.

PROFESSOR GRAHAM, President, in the Chair.

A donation was presented from Mr William Christy junior, being the last portion of the valuable Herbarium which he has from time to time been transmitting to the Society. The special thanks of the Society were directed to be given to Mr Christy for this valuable addition to his former splendid donations.

Dr DOUGLAS MACLAGAN communicated the result of some experiments which he had made upon a bark which he had received from Demerara, and which appears to belong to a large timber-tree known in the West India Islands under the name of the Greenheart Tree, and in Demerara bearing the Indian name *Bee-beeru*. Dr Maclagan had not been able to ascertain the scientific name of this tree, and requested information from the Society upon the subject. The bark had been previously examined

by Mr Rodie, surgeon, R.N., who had found in it a principle capable of combining with acids, which, in its state of combination as Sulphate of Beebeerine, Mr Rodie had administered with success in cases of intermittent fever. Mr Rodie's solution of sulphate, however, was very impure, containing a large quantity of apparently inert extractive matter. Dr Maclagan had separated this from the sulphate of beebeerine, which he had obtained in the form of a resinous looking semitransparent light brown salt, quite incapable of crystallizing, very soluble both in water and alcohol, and having a very intense pure bitter taste.

Dr Maclagan stated, that he had administered Mr Rodie's solution of sulphate of beebeerine with success in one case of ague, and hoped that this bark, as being a native of the British colonies, might be a useful substitute for cinchona bark in times of scarcity.

Dr BALFOUR read a paper by Mr ARCHIBALD GORRIE, Associate of the Botanical Society, "On the Botany of the Hebrews."

This paper was intended chiefly to shew the Hebrew etymology of the names of plants mentioned in the Old Testament, and that in most instances these names were descriptive of the peculiar appearance, uses, or virtues of the different plants to which they are understood to have been applied.

Mr CAMPBELL read the first part of a paper by Dr WALKER ARNOTT, being a "Review of the species of *Fumaria*." The reading of the remainder of the paper was postponed in the hope of obtaining, before next meeting, specimens illustrative of the species described.

Mr CAMPBELL exhibited some Photogenic Drawings of plants in his Herbarium, prepared by Mr PONTON with bichromate of potass, instead of the nitrate of silver, an account of which had been read to the Society of Arts, and has since been published in the Edinburgh Philosophical Journal, vol. xxvii. p. 169.

This being the last Ordinary Meeting of the Session, it was resolved, that, in consequence of there being some papers still unread, an Extraordinary Meeting should be held on Thursday the 25th of July.

EXTRAORDINARY MEETING.

Thursday, July 25. 1839.

PROFESSOR GRAHAM, President, in the Chair.

Mr CAMPBELL read the concluding part of the following paper, being a "Review of the species of *Fumaria*," by Dr WALKER-ARNOTT.

BERNHARDI in the 8th volume of the *Linnæa*, has made some excellent observations on the order of *Fumariaceæ*, and has there, and in the 12th volume of the same work, subdivided greatly the commonly received genus. Of the British species of the order, *Corydalis solida* is referred to his genus *Bulbocapnos*, separated from *Corydalis* by the form of the crista of the seed, and by being pseudo-monocotyledonous, not conspicuously dicotyledonous. *Corydalis lutea* forms, with one or two more, the genus *Capnoides*, having, like the true *Fumaria*, a deciduous style, not a persistent one as in *Corydalis claviculata* and its allies. Of the one-seeded species there are three genera, *Dis-cocapnos* a remarkable genus from the Cape, *Platycapnos* intended to contain *Fumaria spicata*, and the others of De Candolle's first section, and *Fumaria* itself. My intention here is not to examine into the merits of these new genera, but to give specific characters of the plants having a single-seeded, more or less globose fruit, and which constitute the restricted genus *Fumaria*. This I attempted for the British species some years ago, in the 2d edition of Hooker's *British Flora*; but later observations have induced me to propose some alterations, at least in the synonymes, and thus to review the whole.

1. The first I shall notice is *F. capreolata*, Linn. Linnæus, we are informed by Smith, possessed no specimen, he having adopted the species after Bauhin and Ray's descriptions. De Candolle has verified his own, or the Montpellier plant, as that of

Bauhin. Ray's is more doubtful, but seems to be what is called *F. capreolata* by the British botanists; Ray, however, adds from another author a description of what he thinks may be a variety of the same, from Crete; and this is unquestionably the Montpellier form. In the description of his own plant, he nowhere says that the pedicels are recurved; and as that forms part of the Linnean character, we may infer that Linnæus obtained it not from Ray, but from other sources, and thus be led to the conclusion that the Montpellier plant ought to be considered the type of the species. This latter form is very remarkable, having the pedicels bent down, parallel to the peduncle, almost from their point of insertion, and this before the flowers have fallen off; so that the spur of the flower is superior, the apex pointing downwards. De Candolle rejects from his synonyms every reference to English authors, and to Vaillant, both of which he refers to *F. media*. Of the *F. media* of Loisleur I have seen no authentic specimens, but it appears to me, from various considerations, to be wholly the British *F. capreolata*, and to be neither what is considered *F. media* in this country, nor probably that which De Candolle has described under the same name. The English *F. capreolata* has the flowers considerably smaller than in the Montpellier plant; the pedicels are patulous or slightly arched when in fruit, and usually scarcely longer than the bracteas; but in some specimens they are about a third longer as in De Candolle's plant; and in one I have from the Cape of Good Hope, collected by Drege, and, I presume, the *F. capreolata* β . *Burchellii* of De Candolle, the pedicels vary from fully twice the length of the bracteas to only about the same length. From the Rev. T. B. Bell of Edinburgh, I have received a specimen marked "*F. capreolata* of Reichenbach; stems diffuse, pedicels recurved, calyx scales toothed all over with the nerve excurrent, and twice the length of the globose fruit which is compressed at the sides; bracteas one-half the length of the pedicels; plant green." This was collected among potatoes in a garden near Edinburgh, and it accords perfectly with what Mr Bentham and I found at Mourjan, near Narbonne (19th May 1825), and which we considered a small flowered form of *F. capreolata*. Few of the above characters indicated by Mr Bell (from Reichenbach) are constant;

the sepals in De Candolle's plant have sometimes the nerve excurrent, sometimes scarcely conspicuous even at the base; in the English plant it is usually excurrent; the fruit is slightly compressed laterally, that is, parallelly to the sutures, in the whole genus; the bracteas I have mentioned to be of a variable length in respect to the pedicel even in the English form; and the pedicels are scarcely more recurved than in specimens I have from Ormeshead in Wales, Cairndow in Scotland, and from Paris, nearly all in which scarcely exceed the bracteas. Upon the glaucous or green appearance of the foliage, I am inclined to place no dependence; for in the whole genus the herbage is glaucous, and only becomes less so, or greener, when growing in the shade, or in damper and richer soil. This form from Mr Bell, or the plant of Reichenbach, is in several respects intermediate between the true plant of Bauhin, Magnol, and De Candolle, and that of Ray, Smith, and other British botanists, but approaches more to the latter by the smaller flowers and arched pedicels, differing, however, from both by the sepals toothed to the apex, and by being rather diffuse than climbing. As all the three agree in the shape of the fruit, and in the large oval sepals, which are attached so much above the base that they might be termed peltate, I prefer considering them as well marked varieties to separating them as ill defined species. This peltate structure of the sepal is obvious in another species, *F. micrantha* Lag., but in all the others, although the same may be traced with care, the point of attachment is really so near the base that the sepals, by contrast, may be said to be sessile.

2. The next plant to which I shall advert is *F. densiflora* of De Candolle. Unfortunately the description given by that botanist is not so precise as might be wished; but there are a few points in it which seem to fix the species. The racemes,—the flowering ones, I presume,—are said to be dense, as in *F. (Platycapnos) spicata*, the sepals slightly toothed, and somewhat similar to those of *F. media*, DC.; the corolla rather smaller than in *F. media*, DC., and this, as well as every thing else, so much the same as in *F. officinalis*, as to incline De Candolle himself to suspect that it may be only a variety of the latter. From these considerations, one might infer that De Candolle here intended the erect, or common Scottish form of *F. officinalis*, which is found in poor soils; and the rather that De Can-

dolle attributes to his *F. officinalis* quite entire sepals, which, however, is never the case, so far as I have seen, with any of the varieties of that plant. But, both in the specific character and description, De Candolle adds, that the fruit is *globose*, and this is of the greatest consequence, as it shews that this plant cannot be *F. officinalis*. The characters of *F. densiflora* may then be shortly stated to be,—flowers nearly as small as *F. officinalis*, and similar in structure, but the fruit globose as in *F. capreolata*. It is *F. officinalis* in flower, and *F. capreolata* in fruit. We have no British plant subject to these two conditions (that so named by some Edinburgh botanists, and I believe distributed by the Botanical Society, having flowers as small as in *F. parviflora*, is a perfectly distinct and well marked species); but I possess from abroad two specimens which do accord. One is from Paris, and was given me by M. Brongniart erroneously as *F. media*, DC. The second is from Buenos Ayres, where it is said to be common, but has been probably introduced with grain from Spain; this is inadvertently referred by Sir W. J. Hooker and myself to *F. capreolata*, in our contributions to the flora of South America. I have a third specimen from Smyrna, transmitted by the *Unio-itineraria*, and collected by Fleischer, which I very doubtfully refer here; for this last is not in fruit, has the segments of the leaves more deeply and finely divided than in the other two, with large flowers, and a very different habit. In all the three, the sepals are only slightly toothed, and they are much more acuminate than in any other species of the genus: in the two first-mentioned specimens the sepals do not usually fall off till long after the corolla has dropped, not indeed till the globose fruit is nearly mature. The flowers are rather larger than in *F. officinalis*, or *F. media* of Britain, and nearly the size of those of De Candolle's *F. media*. De Candolle mentions two varieties: one with deep purple, the other with pale flowers: my specimens are pale rose-coloured.

3. *F. officinalis*, Linn. De Candolle says of this, “sepala brevia integra,” but Smith describes them as toothed, as I have invariably found them. The true *F. officinalis*, Linn. has the stems erect; and this restricted view of the species is taken by De Candolle. Ray, however, long ago mentioned that it occasionally became diffuse and climbing, like *F. capreolata*; and Smith

says the same. The diffuse form of Ray and Smith is the *F. media* of British botanists: it has paler flowers, and broader and flatter segments to the leaves, but does not otherwise differ. Linnæus, from what he says in his *Species Plantarum*, appears to have viewed all the forms between the erect *F. officinalis*, and the rampant *F. capreolata*, with reflexed pedicels, as hybrids. Loisleur and De Candolle make of them the species *F. media*, as may be judged from the synonymes adduced, although both seem to have taken their descriptions from those forms only which have large flowers. I do not, however, think it at all certain that De Candolle's plant is the same as Loisleur's. The latter appears to be only the usual northern form of *F. capreolata*, or *F. major* Reich. De Candolle's is more doubtful; he refers to authentic specimens of Lagasca's *F. agraria* found in the South of Spain, to *F. cirrhata*, Rohde, and to *F. prehensibilis* of Kitaibel. The two latter, I have no doubt, belong to the northern *F. capreolata*; and Lagasca's *F. agraria*, "flores erecti-patuli tandem recurvi," although found in the south of Spain, may be likewise the British form. I rather consider it to be the *F. capreolata* of Reichenbach, which I have already mentioned as a known native of the south of Europe; but De Candolle seems to have principally examined and drawn his character from Montpellier specimens "pedicellis imo fructiferis erectiusculis," which agrees with none of these specimens referred to. There is yet another circumstance to be attended to: De Candolle, in his specific characters, attributes to *F. capreolata* "siliculis globosis," to *F. officinalis* "siliculis globosoretusis," and to *F. media* "siliculis depressiusculis;" so that one might suppose that he considered the fruit of the last to be of an intermediate shape; but he seems to have used this expression only in order to reconcile the synonymes he adduced with his own plants; for in his detailed description he expressly says, "capsulis apice subretusis," and that the species is much less allied to *F. capreolata* than to *F. officinalis*; and then he adds, "an mera varietas ex solo pinguiori." The plant which De Candolle had principally in view, I believe to be almost entirely confined to the region of the olives, and the only specimens I possess were collected near Montpellier (4th May 1825) for the true *F. media* of De Candolle and the Montpellier botanists; these have the stems erect or rather ascending, and the

leaves scarcely at all disposed to catch hold of the surrounding herbage; flowers about the size of the northern *F. capreolata*, and consequently considerably larger than in any forms of *F. officinalis* that occur in Britain. My specimens have not mature fruit, but I have no hesitation in referring them to *F. officinalis*, with which they agree in the calyx.

4. *F. Vaillantii*, Loisl. This species and the next have the flowers scarcely half the size of those of *F. officinalis*. Whether *F. Vaillantii* be or be not distinct from *F. parviflora*, I have had and still entertain doubts; the foliage is much broader than in *F. parviflora*, and this I should have considered merely the effect of a richer soil, had I not observed the soil to be much the same, or even more dry and sterile than where the other was found; besides, if this were the effects of luxuriance, the other parts ought to be in proportion, yet the calycine leaves, or sepals, are actually more minute, as to the size of the corolla, than in *F. parviflora*. The flowers are always rose-coloured, and in *F. parviflora* white, excepting the tips which, in the whole genus, are of a dark blood colour. I have seen no English specimens, but the figure of *F. parviflora* in English botany is a tolerably good representation of *F. Vaillantii*; and Mr David Don, "on inspecting the specimens marked *F. parviflora* in the Herbarium of Mr T. F. Forster, has found all of them to be *F. Vaillantii*, except some derived from Kent;" and Professor Henslow mentions that he had collected it in 1826 or 1827 on Chatham Hill, in that county.

5. *F. parviflora*, Lam. Some botanists have considered the plant with rose-coloured flowers (or *F. Vaillantii*) to be the true *F. parviflora*, and have called that with white flowers *F. leucantha*. Lamarck however first imposed the name, and his description applies only to that with white flowers. As a species, it is readily distinguished by its small white blossoms tipped with dark purple, minute sepals, and bracts as long as the pedicel. Most of the stations given by Smith in the English Flora are supposed by Mr Don to belong to *F. Vaillantii*; but it has been found abundantly near Edinburgh by D. Steuart, Esq.

6. *F. micrantha*, Lag. Lagasca separated this from *F. parviflora* in his "Generum specierumque plantarum novarum aut minus cognitarum diagnoses," where he gives the following characters of the two:—*F. parviflora*, "calycibus minimis,

floribus erectis, foliis pinnato-decompositis, foliolis tripartitis incisissimis linearibus;" and *F. micrantha*, "calycibus cordato-rotundatis corollæ tubo latioribus, foliis pinnato-decompositis linearibus angustissimis:" so that the latter may be described to be *F. parviflora* as to the foliage, but with large broad sepals. Lagasca does not allude to the colour or size of the flowers of either. *F. micrantha* has them nearly the same as those of *F. officinalis* γ. De Candolle was unacquainted with specimens of this, and places it among the imperfectly known species. Lagasca's character, however, applies very exactly to a plant I collected at Montpellier (15th May 1825), and more lately discovered in various situations in Scotland—as Calton Hill, Lochend, and Dalkeith Railway about Edinburgh; Perth; Airly in Forfarshire; and North Berwick in East-Lothian. It has been probably passed over not unfrequently as a rose-coloured and rather large flowered *F. parviflora*, to which, from the information I received from Mr D. Steuart, who first detected it in Scotland, and before I examined the specimens, I referred it in the second edition of Hooker's British Flora; the description, however, in that work was taken solely from the true *F. parviflora*. To *F. micrantha* belong those specimens which have been distributed by the Botanical Society and the Edinburgh botanists, under the name of *F. densiflora*; and I myself considered, for long, my Montpellier plant as perhaps that species; but I have above shewn that *F. densiflora* of De Candolle has large flowers, and is very different, while, on the other hand, Lagasca's character leaves no doubt as to the true name. This is, moreover, the first instance of the proportion of the calyx, to the other parts of the flower, being admitted to distinguish the species of this genus, although later botanists are aware that such affords one of the most permanent marks. In *F. micrantha*, as in *F. parviflora*, the bractea is about the length of the pedicel; the flowers are deep rose-coloured, as in *F. Vaillantii* and in the erect form of *F. officinalis*.

7. *F. Lichtensteinii*, Schlecht. With this I regret to say I am entirely unacquainted; nor is Schlechtendal, from the fruit being yet unknown, certain that it actually belongs to the genus. It is a Cape plant, and is readily distinguished from all others of the order by its minute flesh-coloured flowers, appa-

rently much smaller than in *F. parviflora*, and by the pedicels being much elongated after flowering. The flowering racemes are short, with the flowers crowded, but afterwards become more elongated, though still shorter than the leaves.

The following are the specific characters I have to propose:—

1. *F. CAPREOLATA*, (Linn.); sepals attached above the base, broadly oval, apiculate, toothed at the base, twice as long as the globose fruit, as broad as the corolla, and about half its length; bracteas equal to or shorter than the fruit-bearing pedicel.

α. Australis; erect, diffuse, or climbing; segments of the leaves usually broad cuneate and flat, sometimes narrow; racemes before the flowers drop off imbricated downwards; pedicels reflexed, about a third longer than the pedicel; sepals entire towards the apex; flowers large, whitish, or rarely deep rose-coloured.—*F. capreolata*, DC., and of all the south of Europe botanists.

β. Reichenbachii; erect or diffuse; segments of the leaves broad cuneate and flat; fructiferous racemes lax; pedicels decidedly recurved, twice the length of the bracteas; sepals toothed to the apex; flowers a third smaller than in *α*, pale.—*F. capreolata*, Reich.—*F. capreolata var. parviflora*, Arn. and Benth. pl. Pyr. exsicc. No. 64.—*F. agraria*, Lag?

γ. Anglica; diffuse and climbing, rarely erect; segments of the leaves broad, cuneate, and flat, rarely narrow; fructiferous pedicels patulous, or more or less recurved, from as short as the bracteas to twice their length; sepals entire towards the apex; flowers a third smaller than in *α*, pale flesh-coloured.—*F. capreolata*, Smith, Hooker, Merat, Agardh, and most northern botanists.—*F. prehensibilis*, Kit.—*F. major* Reich.—*F. capreolata*, *β. Burchellii*, DC.—*F. officinalis*, Drege, pl. Capens. exsicc.—*F. media*, Loisl.

2. *F. DENSIFLORA*, (De Cand.); sepals lanceolate, acuminate, usually persisting till the fruit is nearly ripe, slightly toothed or nearly entire, a little longer than the globose fruit, about $2\frac{1}{2}$ times shorter than the flower, narrower than the corolla, bracteas a third shorter than the erect pedicels; racemes in flower dense; stem erect or ascending; segments of the leaves narrow, cuneate.

3. *F. OFFICINALIS*, (Linn.); sepals ovato-lanceolate, acute, sharply toothed, scarcely so long as the globose and very abrupt or obcordate fruit, narrower and $2\frac{1}{2}$ times shorter than the corolla; bractees from one-third to twice shorter than the erect patulous or patent fruit-bearing pedicels; racemes lax.

α. grandiflora; erect or slightly climbing; segments of the leaves broad and flat; bractees one-third shorter than the pedicels; flowers as large as in *F. capreolata* *γ*, pale rose-coloured.—*F. media*; De Cand. (as to description, but excluding most synonymes).

β. diffusa; diffuse or climbing; segments of the leaves broad and flat; bractees twice as short as the pedicels; flowers pale rose-coloured, size of var. *γ*.—*F. officinalis*, *β. media*, Arn. in Hook. Brit. Flora.—*F. media* of British botanists.—*F. officinalis*, Smith (principally).

γ. vulgaris; erect, sparingly branched; segments of the leaves narrow, somewhat channelled; bractees twice as short as the pedicels; flowers deep rose-coloured.—*F. officinalis*, Linn., De Cand., and most botanists.—*F. officinalis α*, Arn. in Hook. Brit. Flora.

4. *F. VAILLANTII*, (Loisl.); sepals triangular, acuminate, about ten times shorter than the flower, and four times shorter than the spur, slightly toothed, very caducous; fruit globose, slightly apiculate; bractees as long as the fruit-bearing pedicels; stem erect; segments of the leaves broadly linear, flat.—*F. parviflora*, E. B. tab. 590 (not Lam.)—*F. parviflora α*, Arn. in Hook. Brit. Flora, (as to the character).

5. *F. PARVIFLORA*, (Lam.); sepals pointed, about six times shorter than the corolla, incise-toothed, a little shorter than the spur, caducous; fruit globose, slightly apiculate; bractees about the length of the patulous fruit-bearing pedicels; stems diffuse; segments of the leaves very narrow linear, channelled.—*F. parviflora*, *β*, Arn. in Hook. Brit. Flora.—*F. leucantha*, Viv.

6. *F. MICRANTHA*, (Lag.); sepals attached above the base, roundish, cordate, incise-toothed near the base, undulated on the margin, concave on the back, about twice the breadth, and half the length of the corolla; fruit globose, slightly apiculate; bractees spathulata-linear, acute, as long as the patulous fruit-bearing pedicels; segments of the leaves very narrow-linear,

channelled.—*F. parviflora*, α , Arn. in Hook. Brit. Flora (as to the Scottish habitat).

7. *F.?* LICHTENSTEINII, (Schl.) “Stem weak, climbing; leaves bipinnately divided; segments lanceolate, incise; flowers very small; pedicels after flowering capillary, elongated, and six times longer than the bractea.”—Schlechtendal in Linnæa, i. p. 568.

From these it will be observed that I consider the best distinguishing characters to be obtained from the forms of the fruit and of the calyx, and the proportion of the latter to the other parts of the flower; the length of the bracteas to the pedicel is of next value; the direction of the pedicel, the proportion of the spike to the leaves, and its being sessile or stalked, the breadth of the foliage, and the erect or climbing nature of the plant, are of less than secondary importance; while the green or glaucous hue is in some species not sufficiently constant to mark a variety.

The paper was illustrated by specimens from Mr David Steuart’s herbarium, and from the Society’s collection, which had been previously examined by Dr Walker-Arnot.

Mr BRAND read an “Account of a scheme for arranging and classifying the Botanical Society’s *General Herbarium*.”*

Mr Brand stated that this scheme might be readily adapted to any general collection of natural history objects, and resembled in its leading features that which he lately proposed for the Society’s *British Herbarium* (see Proceedings, July 12. 1838). It is founded on the principle of dividing the whole globe into sections or districts, and of receiving into the Herbarium from each section one or more specimens of all plants occurring in it. Mr Brand explained at some length the objects of this scheme, and the advantages which he expected would result from the general adoption of it. They are chiefly, (1.) The acquisition, and arrangement in a classified form, of materials for obtaining a complete view of the earth’s vegetation, both as regards its nature and geographical distribution, and the laws

* An outline of this scheme, along with the relative tables and maps, so far as completed, was submitted to the British Association, at the meeting in Birmingham in September.

or conditions which may seem to regulate these; (2.) Preventing an unnecessary accumulation of specimens in any collection, and enabling naturalists to ascertain with precision when their own wants are supplied, and what portion of their stores may be spared for the advancement of other collections; (3.) Regulating the exertions of naturalists in the formation of collections, and saving much time and labour in the arrangement of these, with their relative catalogues; and, (4.) Introducing and diffusing a uniform standard and mode of arrangement for all collections, so that reference from one to another, and mutual correspondence among naturalists, may be facilitated and otherwise promoted.

In constituting his sections of the globe for these purposes (which he stated were about 110 in number), Mr Brand explained that the following rules had been observed by him.

1. The sections of large continents had been formed and grouped with reference to their mountain or river systems, so as to correspond generally with the course of vegetation which those features might be supposed in some degree to influence and regulate. The limits assigned by him to continental sections are usually, therefore, a mountain ridge, or a line dividing between the sources of rivers, which *implies* an elevated region; but sometimes, especially in dividing countries as yet imperfectly known, the parallels of latitude and longitude, with occasionally the channels of rivers, had been chosen for the purpose of affording a natural or well defined boundary. These he considered in all cases preferable to merely political limits, which are not often fixed according to topographical features, and are besides continually undergoing alterations.

2. In general, the sections proposed have a greater range according to longitude than latitude, where the course of rivers, &c. admitted of such an arrangement,—and countries having an extensive line of coast, especially those which are nearly or altogether insulated, have been usually grouped in smaller sections than those situated in the interior of a continent.

3. The general divisions of the globe have, for the most part, been adhered to, and the sections comprised in each numbered separately; but in some instances, countries or islands, politically or geographically ranked as belonging to one of those general divisions, have been united to the sections of another, with

which they seemed to be locally more connected ; and islands not sufficiently important to be grouped by themselves, have either been included with the nearest section, or attached to it on the map by a tie, to denote that, though connected with such section, they are yet beyond its proper limits.

4. The name or appellation applied to each section is that of the principal city contained in it ; or, if it contain no city of magnitude, the name of its chief province, or some other appropriate distinction, has been selected for the purpose.

With regard to the form and arrangement of the catalogue suited for a general herbarium on the above plan, Mr Brand observed, that to have it framed on the same comprehensive scale as that adopted for the Society's British Herbarium, must occasion an amount of labour and expense out of all proportion to its value when completed. Instead, therefore, of devoting, as in the latter, an entire page of the catalogue to every species, he proposed to have about sixty species recorded in each page, so that from 1800 to 2000 leaves would suffice for recording all the phenogamous species which exist, even supposing their number to reach 100,000.

The following are the principal rules and directions which he gives for the management of this catalogue.

1. The generic and specific names to be written in a central column, with the sectional columns arranged on each side, the generic name being placed in a line by itself, and all the species of a genus being written immediately under, along an inner margin,—a blank space for the insertion of additional species being left, at the end of each genus, equal to about one-third of the species already belonging to it. A farther space might also be left at the end of each alphabetical letter for the insertion of new genera, but he considers that it would be more convenient to record these in a *supplementary* catalogue, and insert only a reference to it in the principal one.

2. The Herbarium to be arranged according to the *natural system* of classification, but the catalogue *alphabetically*, both as regards genera and the species belonging to each genus. And to facilitate reference from the catalogue to the Herbarium, there will be added in the former, after the name of each *genus*, the number of the *order*, &c. to which it belongs, with the number of its *place* in that order ; and after each *species*, will be added

the number of its *place* in the *genus*, corresponding numbers being put on the generic envelopes and species sheets in the Herbarium.

3. All *varieties* to be written, with *red ink*, immediately under the species to which they are referable; and all *additional* species or varieties to be likewise written with red ink,—in both cases, for the purpose of distinction, as not being in alphabetical sequence. Additional species should also have attached to them the number of that species which they immediately follow in the natural arrangement; and additional varieties the number of that species to which they belong.

4. A cross (×), to denote the presence in the Herbarium of a species from any section, is to be placed in the column representing that section; and, along with the cross, signs may be employed, in order to convey a variety of information regarding the specimens obtained, without the necessity of referring to these in the Herbarium.

Thus, × To denote coast or marginal part of a section.

×· inland part of ditto.

×̇ upland part of ditto.

·× parts farthest from equator.

·× parts nearest equator.

·× isles attached to, but beyond the proper limits of a section.

And also the following *temporary* signs, which will be written *in pencil*, viz.:

×^o To denote that the specimen is *imperfect* generally.

×̄ imperfect, as wanting *flowers*.

×[|] as wanting *male flowers*.

×[|] as wanting *female flowers*.

×̄ as wanting *fruit* or *seed*.

And when the *species*, or *locality*, of the specimen is not certainly known, both the cross and signs to be in *pencil*.*

* Imperfect or bad specimens should only be *fixed temporarily* in the Herbarium, so that when perfect specimens are procured, the former may be removed. Of course, it will be understood that *all* the above signs may be used or applied with *one* cross.

5. A note-book to be kept, with reference to the Catalogue and Herbarium, in which should be inserted all such particulars respecting the species or specimens obtained as may be thought deserving of notice,—the entries of these particulars to have each a *number prefixed*, and the *same number* to be entered in the Catalogue opposite the species to which the observation refers.

Mr Brand considered that by these means, if properly followed out, not only would much valuable information be obtained respecting any species, from a mere inspection of the catalogue, but that, in time, when the collection should be nearly perfected, there would exist, in an available form, materials for a complete and almost panoramic view of the department of natural history represented by it.

Mr CAMPBELL read a “ Notice of an excursion to the Black Devon, Cleish Castle, and the Ochil Hills, on 28th and 29th June last,” from which the following are extracts.

This excursion was originally planned by Dr Graham, and Dr Dewar of Dunfermline, to examine a portion of the Ochils, which, from their features and altitude, gave promise of more alpine vegetation than had hitherto been observed within thirty miles of Edinburgh. Unfortunately, however, Dr Graham was prevented from joining the party; and Dr Balfour and I proceeded, on the morning of the 28th of June, to Dunfermline, where we had arranged to meet Dr Dewar and Mr James Dewar.

The part of the country through which we first passed had been all previously most diligently and carefully examined by Dr Dewar, whose accurate knowledge of the localities of most of the rare or interesting plants left little for us to do but to fill our vasculums with each novelty which was pointed out. Many of the species found have already been incidentally noticed in the Proceedings of the Society, as additions to the extended flora of the district round Edinburgh embraced by the Society’s Catalogue; but hitherto no connected view has been afforded of these; and it is on this account chiefly, and to indicate the localities of some additional species observed by the party, that the present remarks are now offered.

From Dunfermline we proceeded, in a north-westerly direction, to the back of the Saline Hills, and entered on the Lethens Moor, near the sources of the Black Devon. *Trientalis europæa* and *Habenaria chlorantha* first presented themselves, the former in considerable abundance, the latter more sparingly. Farther on, *Habenaria albida* occurred in large quantities, chiefly on that part of the moor near the banks of the stream. *Ajuga reptans* was noticed in wet spots, in most instances without stolons, thus presenting one of the chief characters of *Ajuga alpina*. *Polygonum viviparum*, *Carex pilulifera*, *binervis*, and *fulva*, with the usual moorish vegetation, were observed in abundance.

Descending into the Lethens Dene, a fine wild ravine, thickly and beautifully wooded, we met with *Rubus saxatilis*, and shortly afterwards discovered a new and exceedingly abundant station for *Equisetum Drummondii*. A few specimens of *Melica nutans* were picked, observed only in one spot. *Paris quadri-fo lia* pervades the whole wood, and was observed again two miles farther on at Morlit. On leaving Lethens Dene, *Plantago media* was found by Dr Dewar in a field near Hillside, a plant not previously observed by him in the district.

From Hillside we proceeded by Morlit and Aldie to Cleish Castle, where, amid the ruins, and in their immediate vicinity, we obtained specimens of *Meconopsis cambrica*, *Actæa spicata*, *Valeriana pyrenaica*, *Arabis turrata*, *Doronicum plantagineum*, *Scrophularia vernalis*, *Arum maculatum*, *Linaria cymbalaria*, &c. All of these grow either on the ruins of the castle, or by the side of old walls, and in situations where probably the site of the garden formerly was; but now the place is sufficiently wild, and they pertinaciously maintain their ground, and dispute the supremacy with docks and nettles.

The immediately surrounding country is cold-looking, and chiefly pasture, presenting very little attraction to the botanist. We accordingly lost no time at the castle beyond what was required for obtaining specimens of the plants enumerated, and proceeded directly across the country to Carnbo, a small village at the foot of the Ochils, about three miles north-east from the Crook of Devon. At this point we entered Glen Queich, a deep ravine running for a considerable way into the Ochils, and forming the bed of the South Queich, a small stream which falls into

Lochleven at Kinross. The first plant which we met with, and not above one hundred yards from the public road, was *Meum athamanticum*, in great abundance, and in remarkably fine condition for shewing both the flower and seed. *Circea alpina* was observed, but not in flower; and again we encountered large quantities of *Habenaria albida*, copiously intermixed with *Listera cordata*.

The glen now became very narrow, and exceedingly picturesque, the rocks on either side approaching closely, and having a considerable elevation. They were also of that moist, dripping description, which hold out a fair promise to the botanist, with an occasional mountain-ash or birch springing from the crevices. Our time not permitting us to remain long, we satisfied ourselves with picking a few of the more obviqus plants, such as *Saxifraga hypnoides*, exceedingly luxuriant and abundant, *Polypodium Phegopteris*, *Cistopteris fragilis*, &c., our chief search being directed to *Hymenophyllum Wilsoni*, found in this glen in 1834 by Mr Andrew Curror, formerly a pupil of Dr Dewar's, and a zealous and active botanist. Mr Curror's description of the station was soon verified by Mr James Dewar, who first observed the plant, and of which at length we found great abundance covering the rocks in dense patches, from the margin of the stream at their base to the height of twenty or thirty feet. We forthwith retraced our steps down the glen, well laden, and reached Dollar about dusk, where we spent the night.

On the morning of the 29th, having been joined by Mr J. T. Syme, of Dollar, whose residence in the neighbourhood had given him a favourable opportunity of examining the part of the Ochils we were about to visit, we proceeded up the course of the stream which flows through the densely wooded and magnificent ravine leading to Castle Campbell. In the woods, little to interest the botanist was observed except *Equisetum Drummondii* in great profusion, this station for which had been discovered by Dr Dewar last autumn, and fertile fronds sent by him to Dr Graham and others, in April last. The glen abounds in mosses, growing in the most luxuriant manner; and Mr Syme pointed out specimens of the beautiful *Hookeria lucens*, but not in fruit. The splendid ruins of the old castle, perched on the summit and brow of the cliffs overhanging the water, arrested

us for a time, and our botanical enthusiasm was suspended in admiration of the scene. Descending from the summit of the castle, to which we had toiled our way, to the crypts and arches beneath, we found growing in their recesses some magnificent specimens of *Cistopteris fragilis*.

Following the course of the stream, which very soon ceases to be wooded, we directed our steps up Glencairn, which winds for several miles amongst the Ochils, with hills on either side, rising to a height of nearly 2000 feet, and presenting on its western slope some wettish cliffs and gullies of rather a promising aspect. *Saxifraga hypnoides*, *Carex pallescens*, *fulva*, *binervis*, &c. were the first indications of an elevation above that of the plains; and at length *Saxifraga stellaris*, first sparingly, and afterwards in large quantities, presented itself. This plant was discovered by Dr Dewar last autumn. Still farther up the glen, Dr Dewar and Mr Syme almost simultaneously discovered abundance of *Juncus triglumis*, near the edge of the stream, and extending some way up the slope of the hills in the wet springy places. Afterwards, on returning, I found it to be equally abundant at the head of several of the gullies running towards the bed of the stream below; from which more elevated situations, along with *Saxifraga stellaris*, it has doubtless been washed down. Dr Dewar pointed out in several places what he was inclined to think was *Epilobium alsinifolium*, but the specimens were so very young as scarcely to afford any characters. Dr Balfour, however, obtained one or two in flower, in which the stigma was *not divided*, thus distinguishing it from *E. montanum*, some of the states of which the *E. alsinifolium* is said to resemble. If, on the other hand, it should turn out to be *E. alpinum*, from which *E. alsinifolium* is not very easily distinguished, it will prove an equally interesting addition to the Flora within thirty miles of Edinburgh. I may mention that Mr Cleghorn found similar specimens on the Lomond Hills last autumn.

Near the head of the glen, in dry stony places, I collected a *Galium*, apparently a smooth variety of *Galium pusillum*, which although noticed as a variety by Reichenbach and Koch, does not seem to be mentioned as such in our British Floras. The *usual* British plant is hairy, whilst this is quite smooth in every part, and on the revolute margins of the leaves has fine serratures

pointing *backwards*, wherein it seems to differ from all the other *Galiums* with serrated leaves, the prickles or serratures of which are described as pointing *forwards*. Smith, in the English Flora, says of *G. pusillum*, "Our English plant could surely never have been, by any chance, called *laeve*; for if one specimen be smooth, it is always accompanied by hundreds in every state of hairiness." Now, among the specimens from the Ochils, I have looked in vain for the hairy form. This difference should at least constitute a variety, if not sufficient to mark a species. *G. pumilum*, β . *laxius* of Koch, (Synopsis Floræ Germ. et Helvet.), is described, "e basi procumbente erectum, folia quandoque margine setuloso-scabra,"—which very well characterizes my plant. The fruit, in the specimens which I obtained, was too immature to afford a character.

The party having divided to examine the different rocks and gullies, Dr Balfour found *Galium boreale*, and I observed a patch or two of *Saxifraga aizoides*, neither of which had been noticed before in that district, or within thirty miles of Edinburgh.

There only remains to be noticed *Rumex alpinus*, which, admitted into some cottage gardens, is also found, doubtfully wild, in different localities between Dunfermline, Cleish, and Dollar, on roadsides and at the edges of fields. The station where it is farthest removed from cottages and gardens, is near Muckhart Bridge, by the side of the stream.

Leaving Dollar in the afternoon, we returned by the village of Saline to Dunfermline, and thence to Edinburgh, having, in the course of our excursion, traversed and examined an extensive and interesting portion of the counties of Fife, Kinross, and Clackmannan, and obtained a large collection of valuable specimens and duplicates.

The Society was then adjourned by the PRESIDENT till Thursday the 14th of November.

APPENDIX.

A P P E N D I X.

I. EXTRACTS from the MINUTE-BOOK of the BOTANICAL SOCIETY.

November 8. 1838.

The TREASURER read a copy of a Petition (see Appendix, No. II.) signed by the majority of the Council of the Botanical Society, dated 30th July last, and presented to the Right Honourable the Lord Provost, Magistrates, and Council of the City of Edinburgh, praying, that, as Patrons of the University, they would consent to a Union between the Botanical Society's Herbarium and that belonging to the College.

A letter from the PRESIDENT (see Appendix, No. II.) to the Honourable Patrons of the University, containing a recommendation of the proposed union, was also read.

The Treasurer stated that the Petition had been favourably received by the Honourable Patrons, and remitted by them to the Senatus Academicus for farther consideration.

RESOLVED, That the PRESIDENT be requested to convey, in the most special manner, the thanks of the Society to Mr WILLIAM CHRISTY junior, for his very splendid donations to the Herbarium and Library; his contributions to the former consisting of about 8000 species, and upwards of 15,000 specimens of dried plants, chiefly derived from the collections of the Unio Itineraria, of Drummond, Matthews, Cummings, Schomburgk Bridges, Wight, Harvey, Shuttleworth, Lippold, &c.; his contributions to the latter comprising about seventy volumes of scarce or valuable Botanical Works.

December 1. 1838.

RESOLVED by the COUNCIL, That the Bye-Law enacted on 12th April 1838, entitling Societies and Public Bodies to take precedence of the Members at the annual distributions of the Society's Duplicates, be rescinded, and the following substituted in its place, viz.:—

“ That National Institutions, Universities, and Chartered Societies, forming Herbaria, and corresponding with the Botanical Society, shall be permitted to take precedence of the Members at the annual distribution of the Society's Duplicates; and that all other Societies shall have specimens supplied to them in the order of their application, on the same conditions and in the same routine as Members.”

December 13. 1838:

RESOLVED, in terms of a Motion by the TREASURER, which was seconded by Dr BALFOUR:—

“ That, in consideration of the amount of funds necessary for carrying out in an efficient manner the extended objects of the Society, it be earnestly recommended to those Members whose annual payment is only Half a Guinea, to increase it to One Guinea, being the annual contribution of Resident Fellows elected since 9th February 1837; also, that Ten Guineas should hereafter be paid by all Resident Fellows, without distinction, on compounding for their Annual Subscriptions.”

January 10. 1839.

The following Committees were appointed by the COUNCIL:—

MUSEUM AND LIBRARY COMMITTEE,—Professor Christison, Dr Greville, Mr David Steuart, Dr Balfour, Mr William M'Nab, Mr Brand, and the Rev. T. B. Bell.—Dr GREVILLE, Convener.

FINANCE COMMITTEE,—Mr David Falconar, Dr Neill, Mr Lindsay-Carnegie, Dr Pollexfen, Dr E. R. Roberts, and Dr R. W. Falconer.—Dr POLLEXFEN, Convener.

The **TREASURER** read the annual report on the state of the Society's funds, shewing the income and expenditure of the Society for the year ending 31st December last.

ORDERED, That the report be remitted to the Finance Committee, for their examination and final adjustment.

RESOLVED, That the thanks of the Society be given to Mr **BRAND** for the efficient manner in which he had discharged the duties of **TREASURER**, and for his unceasing exertions to promote the interests and welfare of the Society.

RESOLVED, That the special thanks of the Society be given to Mr **DAVID STEUART** for his valuable donation to the Library presented this evening, consisting of thirteen volumes of the Transactions of the Linnean Society.

Mr **BRAND** laid before the Society a scheme which he proposed for the publication of a work under the Society's direction, intended to give a general, but comprehensive view, of the whole range of Botanical Science, both as respects its natural and civil history, and commencing with the earliest period in each department. He proposed that the work should consist of nine separate but connecting Essays or Treatises, under the following heads, the subdivisions of which he fully detailed, viz.

1. The Civil History of Botany in two sections, viz.
 - (1.) Its ancient history, from the earliest period to the subversion of the Græco-Roman Empire.
 - (2.) Its modern history.
2. The Natural History of Botany in two sections, viz.
 - (3.) The original vegetation of the Globe, as deduced from fossil remains.
 - (4.) Its existing vegetation.
3. The Structure, Functions, and Uses of Plants, in two sections, viz.
 - (5.) The structure and functions of plants.
 - (6.) Their properties and uses.

4. Allied subjects, having relation to national and domestic economy, in three sections, viz.

- | | |
|---------------------|-----------------------------|
| (7.) Agriculture, | } as connected with Botany. |
| (8.) Horticulture, | |
| (9.) Arboriculture, | |

And that the Society should invite its members to write these several Treatises, according to a plan, and on certain conditions specified by him.

The proposal was remitted to the following Committee, to be reported upon at next meeting :—Dr Graham, Dr Greville, Dr Neill, Dr Balfour, Mr Forbes, and Mr Campbell.—Dr BALFOUR, Convener.

February 14. 1839.

RESOLVED, That the following Report by the Committee appointed to consider Mr BRAND'S proposal for publishing a series of essays on Botanical subjects be adopted :—

“ The Committee appointed at last meeting to examine Mr Brand's proposal for the publication of a Botanical work, beg to report, that, after mature deliberation, they consider the plan much too extensive to allow of its immediate adoption by the Society. The Committee, however, think that the subjects included in Mr Brand's scheme are of great interest and importance, and they would therefore call the attention of individual members to them, with the view of their submitting Treatises of such value as may induce the Society ultimately to edit a work of the nature contemplated.*

(Signed) “ J. H. BALFOUR, Convener.”

March 14. 1839.

A letter to the PRESIDENT, from the Secretary to the Royal Institution, was read, granting to the Society the use of the

* Members who propose writing Treatises in conformity with the above plan are requested, before doing so, to communicate with Mr Brand, or the Secretary.

Library of the Institution, to afford additional accommodation on the evenings of meeting.

RESOLVED, That the thanks of the Society be given to the Directors of the Royal Institution for the accommodation so liberally afforded.

RESOLVED ALSO, That the thanks of the Society be given to the Society of Antiquaries for having opened their Museum to the Members and Visitors present at the Anniversary Meeting this evening.

Dr POLLEXFEN reported, on behalf of the Finance Committee, that they had examined the Treasurer's accounts, and found the same to be correct. He farther reported, that the total receipts of the Society for last year had amounted to L.167 10 3

And the expenditure to	.	.	.	146 11 11
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Leaving a surplus of	.	.	.	L.20 18 4
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That the Society's present annual income, arising from the contributions of Resident Fellows, is about L.80; and that the accumulated funds of the Society, including arrears, but without reckoning the value of Reports, Catalogues, &c. amounted at 31st December last to L.177 : 2 : 8.

The TREASURER laid on the table an Extract from the Record of the Town-Council of Edinburgh, of an "ACT OF COUNCIL in favour of the BOTANICAL SOCIETY," (see Appendix, No. II.), agreeing to a union of the Society's Herbarium with that belonging to the University, and granting the use of apartments in the College, in terms of the Petition presented in name of the Society on 30th July last.

April 11. 1839.

The SECRETARY intimated that Dr Traill had given the Society the temporary use of a room in the College, adjoining that in which the Herbarium is kept, to be employed as a Library and Consulting-room.

RESOLVED, That the thanks of the Society be given to Dr TRAILL for the accommodation thus afforded.

RESOLVED, in terms of the following motions by Mr CAMPBELL, which were seconded by Mr BRAND:—

1. “ That any Member who contributes 500 specimens of British plants (including at least 100 species) shall be entitled to a portion of the Society’s foreign plants, *if desired*, but only at the rate of 100 species of foreign plants for each 100 species of British plants contributed in the proportion above mentioned.”

2. “ That if the Society shall be unable adequately to supply the desiderata of any Member *not wishing foreign plants*, it shall be in the power of such Member either to take his parcel as made up, or allow it to lie over till the following year’s distribution, in which it shall be placed according to his order in the list, without any farther contribution being required for that year; this privilege, however, not to extend beyond three consecutive years.”

3. “ That the Museum Committee shall be empowered to reject all bad and imperfect specimens, in determining the number of species to which any Member is entitled, in return for his contribution.”

4. “ That the existing laws, regulating the distribution of specimens, shall be altered in conformity with the above resolutions.”

May 10. 1839.

RESOLVED, in terms of a motion by Mr FORBES, which was seconded by Dr BALFOUR:—

“ That the Society print a Catalogue of the Fossil Plants of Britain in a similar manner, and for the same purposes as the list of the existing Flora; and that a Fossil Herbarium be formed, to which such members as are geologists shall be invited to contribute.”

Mr Forbes, Mr Torrie, and Mr Cunningham were appointed a Committee to frame the proposed Catalogue, and to report previous to its being printed.—Mr FORBES, Convener.

July 25. 1839.

Mr BRAND having communicated a scheme for the arrangement and classification of the Society's *General Herbarium* (See Proceedings, page 108), and the Society having expressed their approbation of the scheme, and their sense of its importance for the arrangement of Natural History collections generally, the following Committee was appointed to consider its details more minutely, viz. the President, Dr Greville, Dr Balfour, and Mr Brand.—Mr BRAND, Convener.

The following Committee was appointed by the COUNCIL to prepare, and superintend the publication of, the Third Annual Report, viz. the President, Dr Balfour, Mr Brand, Mr Forbes, and Mr Campbell.—Mr CAMPBELL, Convener.

APPENDIX.

II. ACT of COUNCIL in favour of the BOTANICAL SOCIETY.

At Edinburgh, the 8th day of January, in the year 1839.

Which day, the Right Honorable the Lord Provost, Magistrates, and Council of the City of Edinburgh being assembled: Read, a Report by the College Committee, to whom was remitted Memorial and Petition of the Botanical Society; which Memorial and Petition, letter from Professor Graham thereto appended, and Report by the Committee, are of the following tenor:—"To the Honourable the Patrons of the University of Edinburgh, the Memorial and Petition of the undersigned Office-bearers of the Botanical Society, for themselves and in name of the Society, humbly sheweth, That the Botanical Society was originated in March 1836, by the Professor of Botany and some of the more advanced Cultivators of the Science in this City and neighbourhood. The objects for which it was instituted were threefold: (1.) To form a General Herbarium, on scientific principles, for the use and information of Members, as well as all other Students of Botany. (2.) To establish a system of exchange, by which plants from every country should be brought to Edinburgh, as to a common centre, and from thence be as widely dispersed among those who should enrol themselves as applicants for them on the terms prescribed; and (3.) To promote, by correspondence, essays, and other means, a well regulated taste for the study of Botany, an accurate inquiry respecting the phenomena of vegetation, and a general investigation into the properties and uses of plants.

"That the Society, which, at its origin, consisted but of 21 members, has, in little more than two years, become increased tenfold, its members now amounting to about 200, of whom 26 are Honorary Members; 82 Resident; 64 Non-Resident, and 27 Foreign Members,—comprehending most of the distinguished names in Botanical Science throughout the world.

"That the objects which the Society had in view at its formation, have already been carried out to a very considerable extent. A large collection of British and exotic plants has been acquired,—the Countess-Dowager of Dalhousie alone, having munificently presented the Society with above 1500 species of rare and valuable East Indian plants, collected under her own immediate superintendence,—and not less than 150,000 specimens from all parts of the Globe, have been contributed by Members, a great proportion of which have again been as widely circulated among public institutions, and individuals forming herbaria.

"That Her Majesty has been graciously pleased to honor the Society by becoming its Patron; and its design has received the general approbation

and support of Botanists both at home and abroad. It has also recently provided an appropriate diploma and seal, for the better distinguishing of its members, and for attaching them more decidedly to the pursuit of its objects.

“ That the society have hitherto, by the kindness of the Professor of Botany, been allowed to hold their meetings, which occur monthly, in the Botanical Class-room ; and have also been favoured by him with the use of the apartments in the College appropriated to the University Herbarium for the storing of their collections, and for effecting their annual distribution of plants.

“ That, being now firmly established, the Society are proceeding to classify and arrange their collections, for which purpose they have had an assistant curator, with a salary, constantly employed since the middle of December last ; and, from the scale on which their operations are now necessarily carried on, they find that his services will henceforth be permanently required.

“ That the Society having for their chief object to advance the cause of Botanical science, and thereby promote the public benefit, it has occurred to them that the collections of plants which have from time to time been transmitted to the College, and are now deposited in an unarranged state in the apartments above mentioned, so as to be wholly unavailable for scientific purposes, might, with great advantage to all parties, be handed over to the Society, as well as the permanent use of those apartments, in order that a General Herbarium might be formed, in connection with the University, to which all who cultivate the science of Botany might have ready access for reference and study.

“ That the Society, if this were granted, would immediately proceed to classify and arrange the joint collections, and would agree that they should become the University Herbarium, of which, however, the Society should continue perpetual curators, but the Professor of Botany for the time to be *Honorary Curator*, with free access to the collection, whether a member of the Society or not.

“ That, as the plants belonging to the Society already outnumber those belonging to the College, and as much expense must be incurred in their arrangement and preservation, it is hoped the Honourable Patrons will be satisfied that the Society, in making the foregoing proposition, can have no other object in view than that of promoting the science they cultivate, and the general interests of the University where that science is so zealously, ably, and successfully taught.

“ May it therefore please the Honourable Patrons to take this Memorial into their favourable consideration, and accede to the proposal now made on behalf of the Botanical Society, and your petitioners shall ever pray, &c.” (Signed) “ J. H. Balfour, M. D., Vice-President ; Robert Kaye Greville, LL. D., Councillor ; Dav. Falconar, Vice-President ; R. Christison, V.-P. ; John Percy, Councillor ; John H. Pollexfen, M. D., Councillor ; Pat. Neill, V.-P. ; William M'Nab, Councillor ; William Brand, Treasurer ; James M'Nab (Curator) ; W. H. Campbell, Secretary.” (Dated) “ July 30th 1838.” Letter from Professor Graham :—“ My Lord Provost and Gentlemen, Having read the foregoing petition, I beg to express my anxiety that its prayer should be acceded to. Without some such arrangement, I feel sure that the

University Collection will, as from its first beginning in the period of the late Dr Hope, remain utterly useless;—with such an arrangement, I feel equally sure that the Collection as it now stands will be made available, and that, before long time, it will form only a small portion of a much greater and very valuable collection, which it is most liberally proposed shall become the property of the University.—I am, &c.” (Signed) “ROBT. GRAHAM.” Report by the Committee:—“*Edinburgh, 27th December 1838.*—The College Committee having resumed consideration of this petition, and having communicated on the subject with the Senatus Academicus and with the petitioners, are of opinion that the prayer thereof may be granted by the Magistrates and Council with these explanations and conditions: viz.

“ 1. That the Society are to have no right of property in the rooms set apart for the University Herbarium, but that these are to be held by them during the pleasure of the Council, and on condition that they shall remove therefrom at any term of Whitsunday, on getting six months previous notice; it being understood, that, in this event, or in the event of the Society removing because of the apartments allotted for them becoming either inadequate or unsuitable, they are to be entitled to take the whole Collections along with them, and also any cabinets, &c. which they have fitted up; but with this *proviso* always, that in either case the Collections should continue to be the University Herbarium just as before.

“ 2. That the members of the Senatus shall *ex officio* have access to the joint Collections at all times.

“ 3. That the Professor of Botany, besides being Honorary Curator, shall be entitled, for the instruction of his Class, to take out from the joint Collections such portions thereof, from time to time, as he shall think necessary, the same being always duly restored; and that the Professor of Materia Medica shall have the same privilege with respect to his Class.

“ 4. That a Report of the state and progress of the Herbarium shall be annually presented to the Senatus and the Town-Council, by the 1st day of November.” (Signed) “JAMES STARK, B.” The Magistrates and Council approved of the foregoing Report, and granted and declared accordingly. Extracted from the Council Record upon this and the fourteen preceding pages, by

(Signed) CARLYLE BELL, Conj^t.-Clk.

APPENDIX.

III. REPORT by the BOTANICAL SOCIETY OF EDINBURGH, on the State and Progress of the University Herbarium, for the year ending 31st October 1839.

The Botanical Society, in terms of their agreement with the Honourable Patrons of the University, dated 8th January last, whereby the whole Collections of Plants in the College were, on certain conditions, handed over to the Society, for the purpose of being united with their own Herbarium, beg to report as follows, with respect to the state and progress of the joint Collections. As this will form the groundwork of all future reports, it may be proper to enter somewhat fully into details,—and for the sake of perspicuity, these may be given under four heads, viz.—

1. Respecting the Society's own Collection.
2. Respecting that belonging to the University.
3. As to the Society's proceedings for the arrangement and preservation of both Collections.
4. Respecting the Society's Library.

I. RESPECTING THE SOCIETY'S OWN COLLECTION.

The Society was instituted in March 1836, and, during the first year of their operations, had acquired about 4,500 species of phænogamous plants, British and Foreign. Since March 1837, they have made large and valuable additions to this collection, having received during that period Foreign plants from between fifty and sixty contributors, and British from a still greater number. The arrangement of these being necessarily deferred till the University collection should be also arranged, preparatory to a union of both, the Society cannot yet state precisely what number of species they possess, independently of the latter, but from a general enumeration given by the curator, and allowing for several contributors having transmitted the same plants, they believe that their collection of Foreign Species will be found

not under	.	.	.	.	.	.	.	.	12,000
And of British Species, about	.	.	.	.	.	.	.	.	1,450
Making together,	.	.	.	.	.	.	.	.	Sp. 13,450

Of almost all these many duplicates were received (amounting in the aggregate to upwards of 100,000 specimens), most of which have been, or will be, distributed among Members of the Society, or public institutions in correspondence with it,—but, previous to such distribution, specimens of every species are selected for the Society's Herbarium.

The number of Cryptogamic species hitherto contributed is not great, and the Society have under consideration measures for extending this branch of the collection, as well as that of Fossil Botany.

The Society's plants are in excellent preservation,—having been mostly collected within the last few years,—and, in general, all necessary information has been obtained respecting them. The countries whence they have been procured (besides the British Isles) are

1. France,	9. Portugal,	16. East Indies,
2. Germany,	10. Egypt,	17. New Holland.
3. Prussia,	11. Algiers,	————
4. Austria,	12. Madeira,	18. Canada,
5. Switzerland,	13. Cape of Good Hope,	19. United States,
6. Italy,	————	20. Mexico,
7. Sardinia,	14. Georgia,	21. West Indies,
8. Spain,	15. Arabia,	22. South American States.

In many of these countries, and elsewhere, the Society have now members or correspondents, and they expect that a constant and rapid accession to the herbarium will be received annually, not only from them, but also from others who may wish to avail themselves of the means of exchange afforded by the Society's plan of operations.

II. RESPECTING THE COLLECTIONS BELONGING TO THE UNIVERSITY.

From a statement of these drawn up by the Curator, it appears that the total number of species is about 17,500
(comprehending above 50,000 specimens).

But from this number a very large deduction must be made of species (chiefly in the collections of the late Professors Hope and Rutherford), which, having neither dates nor stations assigned to them, cannot be rendered available for the Society's purposes,—many of them being also cultivated specimens, or otherwise defective. The number in this situation is estimated by the Curator at not less than 9000
(whereof about 2000 are British) ———

Leaving of available species only	8500
Of which there may be reckoned,	
British,	1100
Foreign,	7400
	———— 8500
	————

And as many of these are either duplicate species, or have already been obtained for the Society's own collection (the specimens in which are generally more perfect and better preserved), the whole number which will be available for the united Herbarium cannot be reckoned at more than from 6000 to 7000 species. Some of the duplicates may however be useful, according to the scheme of arrangement proposed, as having been received from other countries than those whence the Society's specimens have been obtained.

The number of Cryptogamous species in the collection is estimated at about 500; but from the state of confusion they are in, it is difficult to ascertain their exact number without a more leisurely examination. A considerable proportion of them will however be available either as additional species to those possessed by the Society, or as having been obtained from different localities.

The countries (besides Britain and Ireland) whence the collections have been received are,

- | | |
|-------------------------|---------------------|
| 1. France. | 11. East Indies. |
| 2. Pyrenees. | 12. New Holland. |
| 3. Switzerland. | 13. New Zealand. |
| 4. Ukraine. | 14. Norfolk Isles. |
| 5. Greece. | 15. Society Isles. |
| 6. Syria. | 16. West Indies. |
| 7. Mediterranean Isles. | 17. United States. |
| 8. Teneriffe. | 18. North America. |
| 9. Cape of Good Hope. | 19. Arctic Regions. |
| 10. Mauritius. | |

The last mentioned collection is a small set of 100 species, obtained during Captain Parry's voyages. The most valuable portions of the remainder consist of East Indian species from Drs Russel and Roxburgh, Mr Hamilton Buchanan, and Dr Wallich,—French and Swiss species from Dr Macdonald,—West Indian species from Drs Krauss and Wright,—New Holland species from Mr Fraser, and a general collection from Dr Boott.

Considering the length of time since most of these plants were collected, and during which they have lain undisturbed in their packages, they are generally in good preservation,—but not a few were found entirely destroyed by insects or otherwise, and these have not been reckoned in the total number.

III. AS TO THE SOCIETY'S PROCEDURE FOR THE ARRANGEMENT AND PRESERVATION OF BOTH COLLECTIONS.

The whole plants in both collections have been carefully examined preparatory to final arrangement, and those belonging to the University have also been put in new paper, or otherwise freed from dust, &c., which they very much required. In this work the Curator and Assistants have been engaged, almost constantly, for several months.

The scheme proposed for arranging and indexing the Herbarium is founded on the principle of dividing the globe into appropriate sections or districts, and taking from each of these *one* or more specimens of all species occurring in it,—a catalogue and relative note-book, for recording all useful information connected with the specimens obtained, having been devised so as to suit this plan.

The united Herbarium will consist of *two* parts. (1.) A general collection of all species, both Phænogamic and Cryptogamic, to be arranged according to the natural system of classification; and (2.) a particular collection of

species indigenous in the British Isles, to be similarly arranged. Perhaps also it may be found expedient to have a third or separate collection of species occurring in the Edinburgh district, but this object may be deferred till the others are farther advanced.

IV. RESPECTING THE LIBRARY FORMED IN CONNECTION WITH THE HERBARIUM.

The Society already possesses a considerable number of valuable works on Botany and the allied sciences, many of which are not to be found in any of the public libraries in Edinburgh. These have been acquired partly by purchase, but chiefly by donation from members and others. At present the total number is about 200, of which a large proportion consists of foreign works or translations of them; and many comprise several volumes, such as the Linnean Society's Transactions, Decandolle's Prodrômus, &c. They may be loosely classed as under, viz.—

Floras, and Catalogues of Plants,	.	.	.	60
Works on general Botany,	.	.	.	50
Essays, Treatises, and Monographs,	.	.	.	50
Periodicals and Transactions of Societies,	.	.	.	30
Works on allied subjects,	.	.	.	10
				200
			In all,	200

The Society intend hereafter to prepare a detailed list of their collections, both in plants and books, specifying the donors or sources whence they have been procured; but the above general enumeration will, it is hoped, suffice for present purposes, and the Society's annual reports will supply any deficiency in the information here given.

The Library is to be placed near the Herbarium, in one of two small adjoining apartments, which Professor Traill has liberally given up to the Society for that purpose; and if, as is hoped, he should be enabled to dispense with the other also, the Society would employ it as a consulting-room for the use of members and others. They would then have an entire suite of apartments in the NE. angle of the College, and would be provided with sufficient accommodation, for at least several years to come.

In conclusion, it may be observed, that the members and Institutions transmitting plants annually to the Society, and who have plants sent them in return, now amount to nearly 100, of whom about one-third are resident abroad. The Society's acting Curator attends daily in the Herbarium-room, devoting his whole time to the business of arrangement and distribution; and of late he has obtained an assistant, in order to accelerate the work. The allowances to these, and the other sums expended for the collection, amount to not less than L.100 per annum, exclusive of the Society's general expenses, which are nearly as much more; and from past experience, it may be anticipated that this amount will rather be increased than diminished in future years. The Society are, however, most desirous to place the Herbarium and Library on a footing in all respects worthy of the University

with which they are connected,—and they will cheerfully expend both time and money for so important an object, in the confident hope that public aid will not be withheld from them, should their own means fall short of what is requisite for its full accomplishment.

Humbly reported { To the HONOURABLE PATRONS OF THE UNIVERSITY,
and
To the SENATUS ACADEMICUS,

By

WM. BRAND, Treasurer,
For and in name of the Society.

EDINBURGH, *October* 1839.

APPENDIX.

IV. LIST OF CONTRIBUTORS to the HERBARIUM of the BOTANICAL SOCIETY.

(Continued from Second Annual Report.)

N.B.—Members who have wholly or in part commuted their contributions of specimens, in terms of Bye Law VI., have an asterisk * prefixed to their names.

November 8. 1838.

GEORGE DICKIE, Esq., Aberdeen,	.	Plants from Britain & Davis' Straits.
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December 13.

J. T. SYME, Esq., Dollar,	.	Britain.
Rev. W. HINCKS, York,	.	ditto.
Rev. T. B. BELL, Edinburgh,	.	ditto.
Dr R. C. ALEXANDER, Chippenham,	.	ditto.
C. E. BROOME, Esq., Rudloe,	.	Britain and Switzerland.
G. LUXFORD, Esq., London,	.	Britain.
R. M. LINGWOOD, Esq., Uckfield,	.	ditto.
GEORGE J. LYON, Esq., Glasgow,	.	ditto.
W. GOURLIE jun. Esq., Glasgow,	.	ditto.
Mr J. CRUICKSHANK, Dumfries,	.	ditto.
Mr A. CROALL, Montrose,	.	ditto.
Rev. J. FARQUHARSON, Alford,	.	ditto.
A. SIBBALD, Esq., Edinburgh,	.	ditto.
H. F. C. CLEGHORN, Esq., Edinburgh,	.	ditto.
Dr F. I. WHITE, Edinburgh,	.	ditto.
Mr W. GARDINER jun. Dundee,	.	ditto.
W. A. LEIGHTON, Esq., Shrewsbury,	.	ditto.
E. YOUNG, Esq., Edinburgh,	.	ditto.
Dr G. HOWITT, Nottingham,	.	ditto.
*Dr J. H. POLLEXFEN, Edinburgh, (L.1),	.	ditto.

January 10. 1839.

Dr J. H. BALFOUR, Edinburgh,	.	Britain, Savoy, &c.
H. C. WATSON, Esq., Thames Ditton,	.	Britain.
A. H. BALFOUR, Esq., Edinburgh,	.	ditto.
Dr DOUGLAS MACLAGAN, Edinburgh,	.	ditto.
J. WARD, Esq., Richmond,	.	ditto.

	Plants from
Dr N. TYACKE, Exeter, . . .	Britain.
Dr J. DICKINSON, Liverpool, . . .	ditto.
Professor HENSLow, Cambridge, . . .	ditto.
*C. C. BABINGTON, Esq., Cambridge (L.1),	Britain, Jersey, &c.
Hon. Miss NEVILLE, Audley End, . . .	Britain.
J. BALL, Esq., Dublin, . . .	ditto.
H. BABER, Esq., Cambridge, . . .	ditto.
C. A. STEVENS, Esq., Rochester, . . .	ditto.
T. W. MANN, Esq., London, . . .	{ Britain, Switzerland, and Germany.
R. MAUGHAN, Esq., Edinburgh, . . .	Britain.
J. S. MORRIESON, Esq., Edinburgh, . . .	ditto.
EDWARD FORBES, Esq., Edinburgh, . . .	Britain and Illyria.
Dr J. SHAW, Edinburgh, . . .	Savoy.
J. M'NAB, Esq., Edinburgh, . . .	Britain.
T. FRASER, Esq., Edinburgh, . . .	ditto.
M. J. F. SIDNEY, Esq., Cowpen, . . .	ditto.
P. CRUICKSHANK, Esq., Edinburgh, . . .	ditto.
WALTER SCOTT, Esq., Edinburgh, . . .	ditto.
Dr J. E. CURREY, Edinburgh, . . .	ditto.
Professor GRAHAM, Edinburgh, . . .	Britain and Ireland.
A. FLEMING, Esq., Aberdeen, . . .	Britain.
J. VERONGE, Esq., Edinburgh, . . .	ditto.
W. F. LINDSAY-CARNEGIE, Esq., Edinburgh,	ditto.
Rev. A. RUTHERFORD, Kingussie, . . .	ditto.
W. BRAND, Esq., Edinburgh, . . .	ditto.
Monsieur C. B. LEHMANN, Berlin, . . .	Germany.
Rev. W. S. HORE, Devonport, . . .	Britain.
Dr GILBERT M'NAB, Jamaica, . . .	Jamaica.
W. H. CAMPBELL, Esq., Edinburgh, . . .	Britain.
W. A. STABLES, Esq., Cawdor Castle, . . .	ditto.
R. LEYLAND, Esq., Halifax, . . .	ditto.

February 14.

Dr F. I. WHITE, Edinburgh, . . .	Britain.
* DAVID STEUART, Esq., Edinburgh (L.1).	
* Dr H. B. M. HARRIS, Edinburgh (L.2.)	
Dr T. BELL SALTER, Ryde, . . .	Britain, &c.
BOTANICAL SOCIETY OF LONDON, . . .	Britain.
G. LUXFORD, Esq., London, . . .	ditto.
Dr D. C. MACREIGHT, London, . . .	ditto.
Dr F. J. FARRE, London, . . .	ditto.
Dr W. B. CARPENTER, Bristol, . . .	ditto.

March 14.

Mr W. GARDINER jun., Dundee, . . .	Britain.
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April 11. 1839.

Dr C. F. MEISNER, Basle,	.	.	Plants from Switzerland.
Möns. A. FISCHER, Basle,	.	.	ditto.
Dr J. K. SCHMIDT, Berne,	.	.	ditto.
Rev. L. LERESCHE, St Cierge,	.	.	ditto.
Rev. F. C. REHSTEINER, Teuffen,	.	.	ditto.
Rev. C. MÜNCH, Basle,	.	.	ditto.
Mons. F. RUGEL, Basle,	.	.	ditto.
P. J. BROWN, Esq., Eichenbühl,	.	.	ditto.
R. J. SHUTTLEWORTH, Esq., Berne,	.	.	ditto.
Mr W. GARDINER jun., Dundee,	.	.	Britain.

May 10.

Professor SERINGE, Lyons,	.	.	France.
* J. E. LEEFE, Esq., Richmond (L.1.)			

June 13.

Dr F. I. WHITE, Edinburgh,	.	.	Britain.
Mr W. GARDINER jun., Dundee,	.	.	ditto.

July 11.

W. CHRISTY jun., Esq., London,	.	}	Britain, South of Europe, South America, Cape of Good Hope, Georgia, Caucasus, &c.
This Donation comprises the remainder of the late Mr Christy's valuable Herbarium, and consists of about 1000 species.			

October 31.

W. C. TREVELYAN, Esq., Edinburgh,	.	.	Britain.
J. H. HASLAM, Esq., Chesham,	.	.	ditto.
Dr H. B. M. HARRIS, Edinburgh,	.	.	ditto.
J. REILLY, Esq., Galway,	.	.	Ireland.
R. BALL, Esq., Dublin,	.	.	ditto.
SIMON FOOT, Esq., Dublin,	.	.	ditto.
J. BALL, Esq., Dublin,	.	.	Britain and Ireland.
A. FLEMING, Esq., Aberdeen,	.	.	Britain.
Mr A. GORRIE, Annat Cottage,	.	.	ditto.
H. F. C. CLEGHORN, Esq., Edinburgh,	.	.	ditto.
Dr J. H. BALFOUR, Edinburgh,	.	.	Britain, Switzerland, &c.

APPENDIX.

V. DONATIONS to the LIBRARY of the BOTANICAL SOCIETY.

(Continued from Second Annual Report.)

N.B.—Books which are duplicates, or continuations of works previously received, have the original numbers prefixed, within brackets; the others are numbered in regular succession. The numbers in the previous Lists have been partially altered, to admit of this arrangement.

December 13. 1838.

- 135 Pouchet (F. A.) *Traité Élémentaire de Botanique Appliquée*, 2 tomes 8vo. Rouen, 1835-6. *From George J. Lyon, Esq.*
- 136 Heward's (Robert) *Observations on a Collection of Ferns from Jamaica*, 8vo, 1838. *From the Author.*
- 137 *Catalogue of the British Natural Orders and Genera, with the Linnean Classes and Orders.* London, 1838. *From the Botanical Society of London.*
- 138 *List of Genera and Natural Orders.* Printed for private distribution. Edinburgh, 1833. *From W. H. Campbell, Esq.*

January 10. 1839.

- 139 *Transactions of the Linnean Society of London, Vols. I. to VIII., and XI. to XV. inclusive*, 4to. London, 1791-1827. *From David Steuart, Esq.*
- (36) *Transactions of the Berwickshire Naturalists' Club, for 1838*, 8vo. *From Dr Johnston.*

February 14.

- 140 Woodville's (William) *Medical Botany*, 3 vols. 4to. London, 1790-93. *From Rev. Thomas B. Bell.*
- 141 ————— *Supplement to Medical Botany*, 4to. London, 1794. *From the same.*
- 142 *Extract from the Second Annual Report of the Botanical Society of London, 1838.* *From the Society.*
- 143 Necker (Nat. Jos. de) *Elementa Botanica*, 2 tom. 8vo. Neowedæ ad Rhenum, 1790. *From Hugh Cleghorn, Esq.*

- 144 Salisbury's (William) Botanist's Companion, 2 vols. 8vo. London, 1816.
From the same.
- 145 Boerhaave (Herm.) Historia Plantarum quæ in Horto Academico Lugd. Bat. crescunt., 12mo. Romæ, 1727. *From the same.*
- 146 Luxford's (Geo.) Flora of the Neighbourhood of Reigate, Surrey, 8vo. London, 1838. *From the Author.*
- 147 Leighton's (W. A.) Flora of Shropshire, 8vo. Part I. Shrewsbury, 1838.
From the Author.
- 148 Royen (Adrian Van) Floræ Leydensis Prodrumus, 8vo. Lugd. Bat. 1740. *From Dr E. R. Roberts.*
- 149 Salter's (T. B.) Account of the Botany of Poole, 8vo. Poole, 1839.
From the Author.

March 14. 1839.

- 150 Hermannus (Paulus) Horti Academici Lugduno-Batavi Catalogus, 8vo. Lugd. Bat. 1787. *From Hugh Cleghorn, Esq.*
- 151 Wulff (Johan. Christoph.) Flora Borussica, 8vo. Regiomonti et Lipsiæ, 1765. *From the same.*
- 152 Broughton (Arthur) Enchiridion Botanicum, 8vo. Londini, 1782. *From the same.*
- 153 List of Premiums offered by the Highland and Agricultural Society of Scotland in 1839. *From the Society.*

April 11.

- 154 Miquel (Fr. Ant. Guil.) Commentatio de vero Pipere Cubeba, folio. Lugd. Bat. 1839. *From the Author.*
- 155 Godet (Ch. H.) Enumeration des Vegetaux Vasculaires qui croissent dans le Canton de Neuchatel, 4to. Neuchatel, 1838. *From the Author.*
- 156 Colladon (L. Theod. Fred.) Histoire Naturelle et Medicale des Casses, 4to. Montpellier, 1816. *From Professor Graham.*
- 157 La Billardiere (Jac. Jul.) Icones Plantarum Syriæ rariorum, 4to. Lut. Paris. 1791. *From the same.*
- 158 Graham (Robert) Papers from the Edinburgh New Philosophical Journal, 8vo, 1829-38. *From the Author.*
- 159 De Candolle (A. P.) Revue Sommaire de la Famille des Bignoniacées, 8vo. Genève, 1838. *From the Author.*
- 160 Wegelin (A. T.) Enumeratio Stirpium Floræ Helveticæ, 8vo. Turici, 1837. *From R. J. Shuttleworth, Esq.*
- 161 Richardson's (Richard) Correspondence, 8vo. Yarmouth, 1835. *From Dr R. K. Greville.*

The Works which follow from 162 to 179 inclusive, were presented by the late William Christy junior, Esq.

- 162 De Boissieu (C. V.) Flore de l'Europe, 2 tome, 8vo. (Incomplete). Lyons, 1805.
- 163 Curtis's (Wm.) Lectures on Botany, 3 vols. 8vo. London, 1805.

- 164 Hooker's (Sir W. J.) *Flora Scotica*, 8vo. London, 1821.
- 165 Coxe's (W.) *Literary Life and Select Works of Benjamin Stillingfleet*, 3 vols. 8vo. London, 1811.
- 166 Greville's (R. K.) *Flora Edinensis*, 8vo. Edinburgh, 1824.
- 167 Francis' (G. W.) *Analysis of the British Ferns and their Allies*, 8vo. London, 1837.
- 168 Pulteney's (R.) *Sketches of the Progress of Botany in England*, 2 vols. 8vo. London, 1790.
- 169 Galpine's (John) *Synoptical Compound of British Botany*, 8vo. London, 1820.
- 170 Woodforde's (James) *Catalogue of the Indigenous Phænogamic Plants growing in the neighbourhood of Edinburgh*, 8vo. Edinburgh, 1824.
- 171 Barton's (John) *Lecture on the Geography of Plants*, 8vo. London, 1827.
- 172 Cooper's (Daniel) *Flora Metropolitana*, 8vo. London, 1836.
- 173 Brown (R.) *Supplementum primum Prodromi Floræ Novæ Hollandiæ*, 8vo. Lond. 1830.
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CORRIGENDA.

- Page 68, line 3 from bottom, for "*cuneosus*" read "*canescens*"
- Page 69, line 3 from top, for "Adelsberg" read "*P. aviculare*."
- Page 76, line 9 from bottom, for "Kellebur" read "Kittebeer."
- Page 77, line 2 from top, after "Lipizza" add "The second is a variety of the first, but retains its characters in cultivation."
- Page 77, line 7 from top, after "species" add "It is only a variety of *G. dioicum*."

