

JOURNAL

OF

THE PROCEEDINGS

OF

THE LINNEAN SOCIETY.

BOTANY.

WELLS	
LIBRARY	
VOL. VI.	80
	100
	20

LONDON:

SOLD AT THE SOCIETY'S APARTMENTS, BURLINGTON HOUSE;

AND BY

LONGMAN, GREEN, LONGMANS AND ROBERTS,

AND

WILLIAMS AND NORGATE.

1862.

WELLCOME INSTITUTE LIBRARY	
Coll.	WeIMOmec
Coll.	
No.	

PRINTED BY TAYLOR AND FRANCIS,
RED LION COURT, FLEET STREET.

LIST OF PAPERS.

	Page
BABINGTON, CHARLES C., M.A., F.R.S., F.L.S., Professor of Botany in the University of Cambridge.	
On the Discovery of <i>Carex Ericetorum</i> , Poll., as a Native of Britain.	30
BENTHAM, GEORGE, Pres. L.S.	
Notes on <i>Caryophylleæ</i> , <i>Portulacææ</i> , and some allied Orders	55
Notes on <i>Malvaceæ</i> and <i>Sterculiaceæ</i>	97
On <i>Inocarpus</i>	146
CARRUTHERS, WILLIAM, F.L.S.	
On some Species of Oak from Northern China, collected by W. F. Daniell, M.D., F.L.S.	31
DARWIN, CHARLES, M.A., F.R.S., F.L.S., &c.	
On the Two Forms, or Dimorphic Condition, in the Species of <i>Primula</i> , and on their remarkable Sexual Relations	77
On the Three remarkable Sexual Forms of <i>Catasetum tridentatum</i> , an Orchid in the possession of the Linnean Society	151
EDGEWORTH, Michael P., F.L.S.	
<i>Florula Mallica</i> . (With a Plate.)	179
GRISEBACH, Dr. A. H. R., F.M.L.S.	
Notes on <i>Coutoubea volubilis</i> , Mart., and some other <i>Gentianeæ</i> of Tropical America:	140
HARVEY, W. H., M.D., F.R.S. & L.S., Professor of Botany in the University of Dublin, &c.	
Notice of a Collection of Algæ made on the North-West Coast of North America, chiefly at Vancouver's Island, by David Lyll, M.D., R.N., in the years 1859-61.	157
HOOKER, J. D., M.D., F.R.S., F.L.S., &c.	
On the Vegetation of Clarence Peak, Fernando Po; with De- scriptions of the Plants collected by Mr. Gustav Mann on the higher parts of that Mountain.	

LINDLEY, Dr., F.R.S., F.L.S., &c. West African Tropical Orchids	123
MANN, GUSTAV, Botanist to Dr. Baikie's Niger Expedition. Account of the Ascent of Clarence Peak, Fernando Po, altitude 10,700 feet.	27
MASTERS, MAXWELL T., F.L.S. Note on an unusual mode of Germination in the Mango (<i>Mangi- fera Indica</i>)	24
MORE, ALEXANDER G., F.L.S. On the Discovery of <i>Gladiolus Illyricus</i> (Koch) in the Isle of Wight	177
MUNRO, Colonel WILLIAM, 39th Regt., C.B., Chevalier of the Legion of Honour, F.L.S., &c. On the Identification of the Grasses of Linnæus's Herbarium, now in possession of the Linnean Society of London	33
INDEX.	211



Bucerosia edulis.

LIST
OF
THE LINNEAN SOCIETY
OF
LONDON.
1860.

1851

THE LINNÆAN SOCIETY

LONDON

1851

PRINTED BY TAYLOR AND FRANCIS,
RED LION COURT, FLEET STREET.

LINNEAN SOCIETY OF LONDON.

PATRON.

HER SACRED MAJESTY QUEEN VICTORIA.

HONORARY MEMBERS.

HIS ROYAL HIGHNESS THE PRINCE CONSORT, K.G.

HIS MAJESTY LEOPOLD, KING OF THE BELGIANS, K.G.

HIS MAJESTY PEDRO, KING OF PORTUGAL, K.G.

COUNCIL.

THOMAS BELL, Esq., *President.*

JOHN BALL, Esq.

JOHN JOSEPH BENNETT, Esq., *Vice-President.*

GEORGE BENTHAM, Esq., *Vice-President.*

FRANCIS BOOTT, M.D., *Treasurer.*

GEORGE BUSK, Esq., *Secretary.*

THOMAS SPENCER COBBOLD, M.D.

FREDERICK CURREY, Esq., *Under (Botanical) Secretary.*

DANIEL HANBURY, Esq.

JOHN BRAXTON HICKS, M.D.

JOSEPH DALTON HOOKER, M.D.

THOMAS HENRY HUXLEY, Esq.

THOMAS CORBYN JANSON, Esq.

RICHARD OWEN, Esq., *Vice-President.*

WILLIAM WILSON SAUNDERS, Esq., *Vice-President.*

** On the 24th of May, 1861, Five Members of this Council are to be removed, and Five other Members from among the Fellows are to be elected in their room.

F E L L O W S .

An Asterisk is prefixed to the names of those Fellows who have compounded for their annual contributions.

Date of Election.	
1836. Apr. 5.	*ABERDEEN, GEORGE, Earl of, K.G., K.T., <i>Trust. Brit. Mus., F.R.S., S.A. and C.P.S.</i> 7 Argyll-street. W.
1848. Jan. 18.	Adams, Arthur, Esq., <i>Surg. R.N.</i>
1856. Mar. 18.	Adams, Henry, Esq. 19 Hanover Villas, Notting-hill. W.
1831. Jan. 18.	*Addison, William, M.D., F.R.S. 48 Norfolk-square, Brighton.
1822. Apr. 2.	*Alexander, Richard Dykes, Esq. Ipswich.
1857. Dec. 3.	Allis, Thomas, Esq., <i>Hon. Sec. Yorksh. Phil. Soc.</i> Osbaldwick Hall, near York.
1859. Jan. 20.	*Anderson, Thomas, M.D., <i>Assist. Surg. Bengal Army.</i>
1838. Mar. 6.	*Ansell, Thomas, M.D. Harley-place, Bow. E.
1855. Dec. 18.	*Archer, William, Esq., <i>Secr. R. Society for the Promotion of Science,</i> Cheshunt, Tasmania.
1852. June 15.	Armitage, Rev. Edw., M.A. Corscombe Rectory, Dorchester.
1843. Apr. 18.	*Armstrong, Robert, M.D., <i>Deputy Inspector of Hospitals and Fleets.</i>
1825. Nov. 15.	*Arnott, George A. Walker, Esq. LL.D., F.R.S.Ed., <i>Acad. Cæs. Nat. Cur. Soc., Reg. Prof. Bot. in the University of Glasgow.</i>
1818. Dec. 15.	*Ashburner, John F., M.D. 7 Hyde-park-pl., Cumberland-gate. W.
1830. Jan. 19.	*Atkinson, William, Esq. 47 Gordon-square. W.C.
1823. Dec. 16.	*Austen, George, Esq.
1830. June 1.	*Babington, Charles Cardale, Esq. M.A., F.R.S. and G.S., <i>Sec. Camb. Phil. Soc.</i> St. John's College, Cambridge.
1853. Jan. 18.	*Babington, Rev. Churchill, B.D., Fellow of St. John's College, Cambridge.
1847. Feb. 16.	Baird, William, M.D. British Museum. W.C.
1844. June 18.	*Balfour, John Hutton, M.D., F.R.S. L. and E., <i>Reg. Prof. Bot. Edinburgh.</i>
1856. Dec. 2.	Ball, John, Esq. M.R.I.A. 18 Park-street, Westminster. S.W.
1851. Nov. 4.	*Bamber, Richard Parr, Esq. Barton-upon-Irwell, near Manchester.
1859. Dec. 1.	Barford, Alfred Henry, Esq. B.A. 1 Cornwall-terrace, Regent's-park. N.W.
1829. June 2.	*Barlow, Rev. John, M.A., F.R.S. and G.S., <i>Sec. R.I.</i> 5 Berkeley-street, Piccadilly. W.
1818. Feb. 17.	Barnard, Edw., Esq. F.H.S. 6 Adelphi-terrace, Strand. W.C.
1824. Mar. 16.	*Barnes, Philip, Esq. Norwich.
1838. Dec. 18.	*Barnes, Philip Edward, Esq. Coquimbo, Chili.

Date of Election.	
1857. Mar. 17.	Barth, Henry, LL.D., <i>Acad. Cæs. Nat. Cur. Soc., Acad. Reg. Berolin. Corresp.</i> 6 Schelling-strasse, Berlin.
1854. Apr. 18.	Bate, Charles Spence, Esq. 8 Mulgrave-place, Plymouth.
1833. Mar. 19.	*Bateman, James, Esq. F.R.S. and H.S. Knypersley Hall, Staffordshire.
1856. Nov. 4.	Beardsley, Amos, Esq. Grange, Newton in Cartmel.
1850. Feb. 19.	*Bedingfeld, Rev. James. Bedingfeld, Suffolk.
1860. Feb. 16.	Belfrage, John Henry, Esq. 7 New Inn, Strand. W.C.
1815. May 2.	BELL, THOMAS, Esq. V.P.R.S., F.G.S., <i>Prof. Zool. King's Coll. Lond., Acad. Cæs. Nat. Cur. Soc., Soc. Hist. Nat. et Philom. Paris, Acad. Sc. Philad., Soc. Hist. Nat. Bost., et Lit. et Sc. Hung. Corresp.</i> 17 New Broad-street, E.C. ; and Selborne, Hants. PRESIDENT.
1831. Dec. 20.	*Bennett, George, M.D., F.R.C.S., F.Z.S., <i>Member of the Med. Faculty of University</i> , Sydney, New South Wales.
1828. Feb. 19.	BENNETT, JOHN JOSEPH, Esq. F.R.S., <i>Soc. Reg. Bot. Ratisb. Corresp.</i> British Museum. W.C. VICE-PRESIDENT.
1828. Nov. 18.	*BENTHAM, GEORGE, Esq. F.H.S. 91 Victoria-street, Westminster. S.W. VICE-PRESIDENT.
1849. Apr. 3.	Bentley, Robert, Esq. M.R.C.S., <i>Prof. Bot. King's Coll. Lond. ; Prof. Bot. and Mat. Med. to the Pharmaceut. Soc.</i> 2 Clarendon Villas, Belsize-road, St. John's-wood. N.W.
1836. Apr. 19.	*Berkeley, Rev. Miles Joseph, M.A., <i>Acad. Cæs. Nat. Cur. Soc.</i> King's Cliffe, Wansford.
1814. Feb. 15.	*BEVERLEY, GEORGE, Earl of, F.R.A.S. 8 Portman-square. W.
1835. Mar. 17.	*Beverly, Charles James, Esq. F.R.S. 2 Cambridge-place, Widcombe-hill, Bath.
1819. Feb. 16.	*Bigelow, Jacob, M.D., <i>Prof. Mat. Med. Harvard University</i> , Cambridge, New England.
1828. Mar. 4.	*Bird, Rev. Charles Smith, M.A., <i>Chancellor of Lincoln.</i> The Chancery, Lincoln.
1859. Dec. 1.	*Bird, Peter Hinckes, Esq. 1 Norfolk-square, Hyde-park. W.
1846. June 16.	*Birkett, John, Esq. F.R.C.S. 59 Green-st., Grosvenor-sq. W.
1827. Apr. 17.	*Blackwall, John, Esq. Hendre House, near Llanrwst, Denbighshire.
1859. Mar. 3.	Blunt, George Vernon, M.D., <i>Prof. Med. Jurisp. Queen's Coll. Birm.</i> 7 Old-square, Birmingham.
1860. Mar. 1.	Bohn, Henry G., Esq. North End House, Twickenham. S.W.
1819. Mar. 2.	*BOOTT, FRANCIS, M.D., <i>Acad. Amer. Bost. Soc. Hon.</i> 24 Gower-street, Bedford-square. W.C. TREASURER.
1805. Dec. 3.	*Borrer, William, Esq. F.R.S. Henfield, Sussex.
1839. Nov. 19.	*Borrer, William, jun. Esq. M.A. Cowfold, Sussex.
1839. Nov. 5.	*Botfield, Beriah, Esq. M.P., F.R.S., S.A., G.S. and H.S. 5 Grosvenor-square, W. ; and Norton Hall, Northampton.
1845. Mar. 4.	*Bowerbank, James Scott, Esq. LL.D., F.R.S. and G.S. 3 Highbury-grove, Islington. N.
1859. Jan. 20.	*Boycott, Thomas, Esq. 3 Inverness-place, Bayswater. W.
1799. July 16.	*Boys, Henry, Esq. King's College, Toronto, Upper Canada.
1859. June 16.	Bradford, Edward, Esq., <i>Dep. Inspector-Gen. of Hospitals ; Hon. Surg. to the Queen.</i> R. Military College, Sandhurst, Farnborough.
1860. June 7.	Bradley, Charles Lawrence, Esq. F.R.C.S. 4 Belitha Villas West, Barnsbury-park. N.
1859. Mar. 17.	Brady, Henry Bowman, Esq. 40 Mosley-st., Newcastle-on-Tyne.

Date of Election.	
1859. Mar. 17.	Braikenridge, Rev. George Weare. Clevedon, Bristol.
1834. Dec. 2.	Brayley, Edward William, Esq. F.R.S., G.S. and C.S., Assoc. Inst. Civ. Eng.; <i>Socc. Phil. Amer., et Basil. Corresp.; Libr. Lond. Instit.</i> 2 Beauchamp Villas, Southgate-road, West Hackney. N.
1860. Jan. 19.	Bree, Charles Robert, M.D., <i>Physician to the Essex and Colchester Hospital.</i> East Hill, Colchester.
1856. Apr. 1.	Brewer, James Alexander, Esq. Holmesdale House, Reigate.
1821. Dec. 4.	Brightwell, Thomas, Esq. Surrey-street, Norwich.
1838. Apr. 3.	Brown, Edward, Esq. Stacey-place, Slough.
1836. Nov. 15.	*Brydges, Sir Harford James Jones, Bart. Boultibrooke, Presteign, Radnorshire.
1833. Dec. 17.	*BUCCLEUCH and QUEENSBERRY, WALTER FRANCIS, Duke of, K.G., D.C.L., F.R.S.L. and E. Belgrave-square. S.W.
1843. Apr. 18.	Buckley, Nathaniel, M.D. Rochdale, Lancashire.
1850. Feb. 5.	*Buckman, James, Esq. F.G.S., <i>Prof. Nat. Hist. in the Agricultural College,</i> Cirencester.
1845. Dec. 16.	*Buckton, George Bowdler, Esq. F.R.S. 55 Queen's-gardens, Bayswater. W.
1858. June 3.	*Buckton, Woodyer Merricks, Esq. 55 Queen's-gardens, Bayswater. W.
1858. Jan. 21.	*Buller, Walter Lawry, Esq. Wellington, New Zealand.
1833. Nov. 19.	Bunbury, Sir Charles James Fox, Bart., F.R.S. and G.S. Barton Hall, Bury St. Edmunds.
1803. Feb. 15.	Burchell, William John, Esq. D.C.L., <i>Soc. Nat. Scrutat. Berolin. Soc.</i> Fulham. S.W.
1823. Jan. 21.	*Burney, Rev. Charles Parr, D.D., F.R.S., S.A., G.S. and H.S., <i>Archdeacon of St. Albans.</i> Rectory House, Wickham Bishops, Witham, Essex.
1819. Feb. 16.	*Burton, Edward, Esq. F.R.S., <i>Surgeon to the Forces.</i> Brooklyn, near Maidstone.
1846. Dec. 1.	*BUSK, GEORGE, Esq. F.R.C.S.E., F.R.S. & G.S., <i>Surgeon to the Seaman's Hospital.</i> 15 Harley-street. W. SECRETARY.
1815. Jan. 17.	*Butter, John, M.D., F.R.S. Plymouth.
1854. Apr. 18.	Byerley, Isaac, Esq. F.R.C.S. Seacombe, Cheshire.
1844. Jan. 16.	Camplin, John Mussendine, M.D. 33 Compton-terrace, Islington. N.
1859. June 2.	Camps, William, M.D. 40 Park-street, Grosvenor-square. W.
1850. Feb. 5.	Capel, Rev. George, M.A. Manor-road, Carshalton. S.
1856. Dec. 2.	*Carpenter, William Benjamin, M.D., F.R.S. and G.S., <i>Socc. Biolog. et Philom. Paris. Socius; Soc. Phil. Amer. Corresp.; Registrar of the University of London.</i> 8 Queen's-road West, Regent's-park. N.W.
1859. Nov. 3.	Carte, Alexander, A.M., M.B., F.R.C.S.I., M.R.I.A., <i>Director of the Mus. Nat. Hist. R. Dublin Soc.</i> Royal Hospital, Kilmainham, Dublin.
1833. Nov. 19.	*Cartwright, Samuel, Esq. F.R.S. and G.S. 32 Old Burlington-street. W.
1846. Feb. 17.	Cautley, Lieut.-Col. Sir Proby T., K.C.B., B.A., F.R.S., G.S. and H.S., <i>Bengal Artillery.</i> 31 Sackville-street, Piccadilly. W.
1858. Nov. 4.	*Chambers, Robert, Esq. F.G.S. Edinburgh.

Date of Election.	
1855. Dec. 4.	Champion, John Francis, Esq. 5 Gresham-road, Brixton. S.
1835. Dec. 1.	*Chance, Edward John, Esq. F.G.S. 59 Old Broad-street, City. E.C.
1846. Dec. 1.	*Chapman, David Barclay, Esq. F.H.S. Roehampton. S.W.
1824. Mar. 16.	Charlwood, George, Esq. F.H.S. 14 Tavistock-row, Covent-garden. W.C.
1856. Feb. 5.	Christy, Henry, Esq. 103 Victoria-street, Westminster. S.W.
1793. Jan. 15.	*Clark, Bracy, Esq. <i>Acad. Sc. Inst. Paris. Corresp., et Soc. Nat. Scrutat. Berlin. Soc.</i> 18 Giltspur-street, E.C.
1860. June 21.	Clark, Rev. Hamlet, M.A. 12 Orchard-st., Portman-sq. W.
1845. May 6.	*Clarke, Benjamin, Esq. Mount Vernon, Hampstead. N.W.
1853. Jan. 18.	*Clarke, Joshua, Esq. Saffron Walden, Essex.
1851. Nov. 4.	*Cleghorn, Hugh F. C., M.D., <i>Surgeon, Madras Army.</i>
1857. Apr. 7.	Cobbold, Thomas Spencer, M.D. 39 Norland-square, Notting-hill. W.
1858. Mar. 18.	Cockle, John, M.A., M.D., F.R.A.S., F.R.C.S.E. 63A Brook-street. W.
1848. Feb. 15.	*Cogswell, Charles, M.D. Halifax, Nova Scotia.
1821. Nov. 20.	Cole, Robert, Esq. Holybourn Lodge, near Alton, Hants.
1822. Nov. 5.	Colebrooke, Lt.-Gen. Sir William M.G., C.B., K.C.H. Datchet.
1847. Mar. 2.	Collings, Rev. William Thomas, M.A. Seigneur de Serk, near Guernsey.
1853. Nov. 1.	*Collingwood, Cuthbert, Esq. M.A., M.B., M.R.C.P., <i>Prof. Physiol. Queen's Coll., and Lect. Bot. R. Infirm. School of Med.</i> 15 Oxford-street, Liverpool.
1819. May 4.	Conquest, John T., M.D. 13 Finsbury-square. E.C.
1857. Dec. 17.	*Cooke, Edward William, Esq. A.R.A. The Ferns, Hyde-park gate South, Kensington. W.
1856. Nov. 18.	Cooke, Robert Barrington, Esq. B.A., M.R.C.S. Scarborough, Yorkshire.
1835. Mar. 3.	*Coope, Augustus Frederick, M.D. Midhurst, Sussex.
1846. Apr. 7.	*Corsellis, Charles Cæsar, M.D.
1824. Mar. 16.	*Couch, Jonathan, Esq. Polperro, Cornwall.
1860. Feb. 16.	*Coulson, William, Esq. F.S.A. 1 Chester-terrace, Regent's-park. N.W.
1830. Jan. 19.	*Crompton, Dickinson Webster, Esq. Birmingham.
1832. May 1.	Cuming, Hugh, Esq. 80 Gower-street. W.C.
1856. Apr. 15.	*CURREY, FREDERICK, Esq. M.A., F.R.S. UNDER (BOTANICAL) SECRETARY. Blackheath-park. S.E.
1822. June 18.	Curtis, John, Esq. Hon. M. Ashm. Soc. Oxf. and Entom. Soc. France, <i>Acad. Imp. Georg. Florent. Soc. ; Acad. Nat. Sc. Philad. Corresp.</i> 18 Belitha Villas, Barnsbury-park. N.
1818. Feb. 3.	*Dale, James Charles, Esq. M.A., F.C.P.S. Glanville's Wootton, near Sherborne, Dorset.
1849. Feb. 20.	Dallas, William Sweetland, Esq. Museum, York.
1822. Mar. 5.	*Daniel, Rev. Richard, M.A., F.S.A. and G.S. Combs, near Stowmarket, Suffolk.
1855. Feb. 6.	*Daniell, William Freeman, M.D., F.R.C.S. and G.S., <i>Staff Surgeon.</i>
1854. Mar. 7.	*Darwin, Charles, Esq. M.A., F.R.S. and G.S., <i>Acad. Cæs. Nat. Cur. Soc.</i> Down, Farnborough, Kent.
1830. Mar. 16.	Daubeny, Charles G. B., M.D., F.R.S., G.S. and H.S., Hon. M.R.I.A., <i>Professor of Botany and Rural Economy</i> , Oxford.

Date of Election.	
1839. Nov. 19.	*Davis, Richard, Esq. F.H.S. 9 St. Helen's-place, Bishops-gate-street. E.C.
1857. Dec. 17.	*Day, Francis, Esq. <i>Assist. Surg., Madras Army.</i>
1855. Nov. 6.	Deane, Henry, Esq. Clapham-common. S.
1849. Nov. 20.	DE GREY and RIPON, GEORGE FREDERICK SAMUEL, Earl, F.R.S., V.P.R.G.S. 1 Carlton-gardens. S.W.
1853. Dec. 20.	Dickinson, John, Esq. F.R.S., A.S. and G.S. 39 Upper Brook-street, W.; and Abbot's Hill, Hemel Hempstead, Herts.
1839. Apr. 2.	*Dickinson, Joseph, M.A., M.D., F.R.S., M.R.I.A. Great George-square, Liverpool.
1855. Dec. 18.	*Dickinson, William, Esq. Shannon House, Workington.
1831. Apr. 5.	*Dickson, Robert, M.D. 16 Hertford-street, Mayfair. W.
1857. Jan. 20.	*Dilke, Charles Wentworth, Esq. F.G.S. and H.S. 76 Sloane-street. S.W.
1836. Feb. 2.	*Dillwyn, Lewis Llewelyn, Esq. M.P., F.G.S. Hendrefoilan, Swansea.
1850. Mar. 19.	Dodd, Grantham Robert, jun., Esq. 26 New Broad-street, City. E.C.
1845. Mar. 18.	Doubleday, Edward, Esq. 249 Blackfriars-road. S.
1832. Mar. 20.	*Downes, Rev. John, M.A. Horton, Northampton.
1860. Feb. 2.	*Dunning, Joseph William, Esq. 1 Field-ct., Gray's Inn. W.C.
1859. Dec. 1.	Durham, Arthur Edward, Esq. 42 Trinity-sq., Southwark. S.E.
1854. Mar. 21.	Dyster, Frederic D., M.D. Tenby, Pembrokeshire.
1858. May 6.	Eardley, Eardley G. Culling, Esq. Bedwell-park, Hatfield, Herts.
1859. Feb. 3.	*Eatwell, William, M.D. <i>Surgeon, Bengal Army; Principal of the Medical College, Calcutta.</i>
1842. Apr. 19.	*Edgeworth, Michael Pakenham, Esq., <i>late Beng. Civ. Serv., Edgeworthstown, Longford, Ireland.</i>
1859. Jan. 20.	*Elliot, Hon. Walter, <i>Madras Civil Service.</i>
1859. Feb. 17.	*Elphinstone, Howard Warburton, Esq. M.A. 45 Cadogan-place. S.W.
1833. Dec. 17.	*Enderby, Charles, Esq. F.R.S. 13 Great St. Helen's. E.C.
1852. May 4.	Evans, Alfred, Esq. M.D., F.R.C.S., L.R.C.P.Ed. Eastfield Lodge, Walthamstow. N.E.
1844. Dec. 3.	Ewer, Walter, Esq. F.R.S., G.S. & H.S. 8 Portland-place. W.
1835. Mar. 17.	Eyton, Thomas Campbell, Esq. F.G.S. Eyton, near Wellington, Shropshire.
1844. May 7.	Falconer, Hugh, A.M., M.D., F.R.S., H.S. and G.S., <i>late Surgeon, Bengal Army.</i> 31 Sackville-street, Piccadilly. W.
1840. June 2.	*Felkin, William, Esq. Nottingham.
1854. June 6.	*Ferguson, William, Esq. F.G.S. 62 Gresham House, Old Broad-street, City, E.C.; and Kinmundy, Aberdeenshire.
1857. Apr. 7.	*Fitch, Walter, Esq. Kew. W.
1827. Apr. 17.	*Fitton, William Henry, M.D., F.R.S. and G.S. 4 Sussex-gardens, Hyde-park. W.
1839. Jan. 15.	*Flower, Thomas Bruges, Esq. M.R.C.S. 7 Beaufort-buildings West, Bath.
1829. Jan. 20.	*Forest, Richard, Esq.
1823. Nov. 4.	*Forster, Edward, Esq. Woodford, Essex. N.E.
1819. Dec. 7.	Forster, John, Esq. 11 Hanover Villas, Notting-hill. W.
1844. Jan. 16.	*Francis, William, Esq. Ph.D., F.R.A.S. Alton Lodge, Richmond.

Date of Election.	
1858. Feb. 4.	Fry, Alexander, Esq. 2 Boltons, Brompton. S.W.
1860. Mar. 15.	Fryer, George Edward, Esq. M.R.A.S., of <i>H. M. Madras Army</i> .
1856. Nov. 18.	Garner, Robert, Esq. Stoke-upon-Trent.
1798. Oct. 16.	Garnier, Very Rev. Thomas, D.D., F.H.S., <i>Dean of Winchester</i> .
1860. Mar. 15.	*Gatty, Charles Henry, Esq. Felbridge-park, East Grinstead, Sussex.
1853. Apr. 19.	*Gibson, Alexander, M.D. <i>Surgeon, Bombay Army</i> , Hewra, near Poonah, Bombay.
1847. Feb. 2.	*Gibson, George Stacey, Esq. Saffron Walden, Essex.
1830. Dec. 7.	*Glynne, Sir Stephen R., Bart.
1838. Mar. 20.	Goadby, Henry, Esq.
1840. Nov. 3.	*Gough, Hon. George Stephens, F.G.S., M.R.I.A. Lough Cutra Castle, Gort, Galway.
1849. June 19.	*Gould, Frederick, Esq. Kingston, Surrey. S.W.
1833. Jan. 15.	*Gould, John, Esq. F.R.S. and Z.S. 26 Charlotte-st., Bedford-square. W.C.
1858. Nov. 18.	Graham, Cyril C., Esq. Cairo.
1820. Nov. 21.	*Grant, Robert Edmond, M.D., F.R.S. L. and E., F.G.S., <i>Prof. Comp. Anat. & Zool. Univ. Coll. Lond.</i> 2 Euston-grove, Euston-square. N.W.
1845. Feb. 4.	*Gray, George Robert, Esq., <i>Acadd. Reg. Scient. Taurin., Imp. Georg. Florent., et Sc. Nat. Philad., Socc. Hist. Nat. Argentorat., et Linn. Lugdun. Corresp.</i> British Museum. W.C.
1857. Apr. 7.	Gray, John Edward, Esq. Ph.D., F.R.S. and R.G.S., <i>Pres. Entomol. Soc., V.P.Z.S., Socc. Cæs. Nat. Cur. Mosq., Hist. Nat. Bost., et Acad. Sc. Philad. Socius, Keeper of the Zoological Collections</i> , British Museum. W.C.
1811. Jan. 15.	*Gray, John, M.D.
1833. Jan. 15.	*Greene, John Singleton Copley, M.D. Boston, United States.
1842. Feb. 1.	Griffith, John William, M.D. 6 Princes-street, Queen's-road, Camden-town. N.W.
1850. Jan. 15.	*Grindrod, Ralph Barnes, M.D., LL.D., F.G.S. and R.G.S. Townsend House, Malvern, Worcestershire.
1846. Nov. 3.	Grote, Arthur, Esq. F.G.S., <i>Bengal Civil Service</i> , Calcutta.
1857. Jan. 20.	Guisse, William Vernon, Esq. Elmore-court, Gloucester.
1850. Jan. 15.	*Gunn, Ronald Campbell, Esq. F.R.S. Penquite, Launceston, Van Diemen's Land.
1859. Mar. 17.	*Gurney, Samuel, Esq. M.P., F.R.G.S. 25 Prince's-gate, Hyde-park, S.W. ; and Culvers, Carshalton.
1859. June 16.	Hale, Rev. William Hale, M.A., <i>Archdeacon of London ; Master of the Charterhouse</i> . E.C.
1857. Feb. 3.	*Haliday, Alexander Henry, Esq. M.A., M.R.I.A. 23 Harcourt-street, Dublin.
1858. Apr. 1.	Hall, Robert W., F.G.S. 37 Great George-st., Westminster. S.W.
1850. Nov. 5.	Hallett, William Henry, Esq. Black Rock House, Brighton.
1856. Feb. 19.	Hambrough, Albert John, Esq. F.G.S. & H.S. Steephill Castle, Ventnor, Isle of Wight.
1844. Jan. 16.	Hamilton, Edward, M.D. 22 Grafton-street, Bond-street. W.
1848. Feb. 1.	*Hamilton, Rev. James, D.D. 48 Euston-square. N.W.
1855. Dec. 4.	Hanbury, Daniel, Esq. <i>Acad. Cæs. Nat. Cur. Soc.</i> Plough-court, Lombard-street. E.C.

Date of Election.

1835. Jan. 20. *Hankey, John Alexander, Esq. 38 Portland-place. W.
1843. Dec. 19. *Hanley, Sylvanus, Esq. 1 Hanley-road, Hornsey-road. N.
1859. Feb. 17. *Harrison, Charles William, Esq. 92 Westbourne-terrace, Hyde-park. W.
1844. Jan. 16. *Harrison, Thomas Sunderland, M.D. Innox Hill House, Frome, Somerset.
1857. Jan. 20. *Harvey, William Henry, M.D., F.R.S., *Acad. Cæs. Nat. Cur. Soc., Prof. Bot. and Keeper of Botanical Collections*, Trinity College, Dublin.
1811. Jan. 15. *Hausmann, Ulrick Frederick, Esq. *Art. Veterin. Prof.* Hanover.
1842. Jan. 18. *Hawkes, Rev. Henry, B.A. Southsea, Portsmouth.
1847. Mar. 16. Hawkins, Benjamin Waterhouse, Esq. F.G.S. Belvedere-road, Upper Norwood. S.
1806. Nov. 18. Hawkins, Edward, Esq. F.S.A. British Museum. W.C.
1854. Jan. 17. Headland, Frederick William, M.D., B.A. 37 Margaret-street, Cavendish-square. W.
1847. Dec. 7. *Hearsey, Major-Gen. John Bennett, C.B., *Bengal Army*.
1827. Apr. 3. *Heath, Josiah Marshall, Esq. F.G.S. Madras.
1818. Feb. 3. Henslow, Rev. John Stevens, M.A., F.G.S. and C.P.S., *Prof. Bot. Camb.* Hitcham, Bildeston, Suffolk.
1849. Jan. 16. *Hepburn, James, Esq. F.G.S. Tovil-place, near Maidstone, Kent.
1836. Jan. 19. Heward, Robert, Esq. 5 Young-street, Kensington. W.
1852. June 1. Hicks, John Braxton, M.D., M.R.C.S. 6 Wellington-street, London-bridge. S.E.
1856. Dec. 2. Hill, Robert Southey, Esq. Basingstoke, Hants.
1843. Dec. 19. Hillier, Rev. John, M.A., Ph.D. Sandwich, Kent.
1826. Jan. 17. Hincks, Rev. William, *Prof. Nat. Hist. University College*, Toronto, Canada West.
1858. Mar. 18. Hitchman, Wm., A.M., M.D. 36 Brunswick-road, Liverpool.
1835. Feb. 3. *Hodgson, Brian H., Esq., *Acad. Lit. Inst. Par. Corresp., late Beng. Civ. Serv.* The Rangers, Dursley, Gloucestersh.
1834. Mar. 4. *Hodgson, Thomas, Esq. Morris Hall, Berwick-on-Tweed.
1859. Nov. 17. Hogg, Jabez, Esq. 1 Bedford-square. W.C.
1822. Mar. 5. Hogg, John, Esq. M.A., F.R.S. and C.P.S., *For. Sec. R.S.L., F.R.G.S.* 8 Serjeant's Inn, Temple, E.C. ; and Norton House, Stockton-on-Tees.
1857. Feb. 17. Holberton, Vaughan Henry Alexander, Esq. Hampton, Middlesex. S.W.
1856. Dec. 2. *Holdsworth, Edward William Hunt, Esq. 26 Osnaburgh-street, Regent's-park. N.W.
1834. Nov. 4. *Holmes, Rev. Edward Adolphus, M.A. St. Margaret's, near Bungay, Suffolk.
1829. Nov. 3. *Holroyd, Arthur Todd, Esq. New Zealand.
1858. Jan. 21. *Hood, William Charles, M.D., F.R.C.P.Ed., *Resident Physician*, Bethlehem Hospital. S.
1806. Dec. 2. *Hooker, Sir William Jackson, K.H., D.C.L. Oxon., LL.D., F.R.S., S.A., G.S. and H.S., Hon. M.R.I.A. and C.P.S. ; *Chevalier de la Légion d'Honneur ; Acad. Sc. Inst. Paris. Corresp. ; Acadd. Reg. Sc. Holm., Monac., et Cæs. Nat. Cur., Socc. Imp. Geogr. Vindob., Reg. Bot. Ratisb., Physiogr. Lund., et Acad. Sc. Philad. Soc. ; Acad. Reg. Sc. Berol. Soc. Hon. ; Director of the Royal Gardens, Kew.* W.

Date of Election.	
1842. June 7.	*Hooker, Joseph Dalton, M.D., R.N., F.R.S. and G.S., Hon. M.C.P.S. and Bengal Asiat. Soc. ; <i>Acadd. Cæs. Nat. Cur., et Imp. Geogr. Florent., Soc. Imp. Geogr. Vindob., Reg. Bot. Ratisb., Harlem., et Caroburg., Soc. ; Acadd. Reg. Sc. Berol. et Monac., et Soc. Agricult. Paris. Corresp. ; Assistant Director, Royal Gardens, Kew. W.</i>
1822. Mar. 5.	*Hope, Rev. Frederick William, M.A., D.C.L., F.R.S. 37 Upper Seymour-street. W.
1833. Mar. 5.	*Hotham, Rev. Charles, M.A. Rooss, Patrington, Yorkshire.
1859. Jan. 20.	Houghton, Rev. William. Solihull, near Birmingham.
1857. Feb. 3.	*Howard, John Eliot, Esq. Lordship-lane, Tottenham. N.
1848. Jan. 18.	*Hudson, Robert, Esq. F.R.S. and G.S. Clapham-common. S.
1826. Mar. 7.	*Hughes, William Hughes, Esq. F.A.S. and H.S. 4 Middle Temple-lane. E.C.
1853. June 7.	Hugo, Rev. Thomas, M.A., F.S.A., M.R.S.L. 5 Finsbury-circus. E.C.
1855. Dec. 4.	Hulme, Robert Thomas, Esq. M.R.C.S.E. 21 John-street, Bedford-row. W.C.
1829. Mar. 17.	*Hurst, James Charles, Esq. Webbery Cross Cottage, Bideford, N. Devon.
1858. Dec. 16.	*Huxley, Thomas Henry, Esq. F.R.S., Sec.G.S., <i>Acad. Cæs. Nat. Cur. Soc. ; Prof. Nat. Hist. Mus. Pract. Geol. Jermyn-street. S.W.</i>
1833. Feb. 19.	Iliff, William Tiffin, M.D. Canterbury-row, Newington Butts. S.
1859. Nov. 17.	*Ince, William Henry, Esq. 27 Thurloe-square, Brompton. S.W.
1837. Mar. 21.	*Janson, Frederick Halsey, Esq. The Lodge, Upper Clapton. N.E.
1843. Mar. 7.	*Janson, Thomas Corbyn, Esq. Stamford-hill, Middlesex. N.
1826. Jan. 17.	*Jardine, Sir William, Bart., F.R.S. Ed. Jardine Hall, Dumfries-shire.
1822. Nov. 19.	Jenyns, Rev. Leonard, M.A., F.G.S. and C.P.S. 1 Darlington-place, Bathwick, Bath.
1823. Jan. 21.	*Jesse, John, Esq. F.R.S. and R.A.S. Llanbedr Hall, Ruthin, Denbighshire.
1836. Mar. 15.	Johns, Rev. Charles A., B.A. Callipers Hall, Rickmansworth.
1850. Jan. 15.	Jones, John Dalston, M.D., M.R.C.S. 1 Queen's-road, Dalston. N.E.
1859. Dec. 1.	Jones, John M., Esq. Bermuda.
1842. May 3.	*Jones, Admiral Theobald, <i>Royal Navy</i> , F.G.S. 30 Charles-street, St. James's. S.W.
1836. Dec. 6.	*Kennedy, Benjamin, Esq. Surbiton, Kingston-on-Thames. S.W.
1832. Feb. 21.	*Kenrick, George Cranmer, Esq. Melksham, Wilts.
1858. Nov. 18.	Kinahan, John Robert, A.B., M.D., M.R.I.A. Museum of Irish Industry, 51 Stephen's-green, Dublin.
1804. Mar. 6.	*King, Joseph, Esq.
1856. Dec. 16.	Kingsley, Rev. Charles, M.A., Canon of Middleham, and Rector of Eversley, Hants.
1856. Dec. 16.	Kingsley, George Henry, M.D., M.R. Coll. Phys. Bridgewater-house, Cleveland-square, St. James's. S.W.
1852. May 4.	Kingsley, Henry, M.D., F.R.C.P. Edin. Stratford-upon-Avon.
1857. Nov. 19.	Knight, Charles, Esq. <i>Auditor-general</i> , Auckland, New Zealand.

Date of Election.	
1848. June 6.	Knox, Arthur Edward, Esq. M.A. Midhurst, Sussex.
1818. Feb. 3.	*Lambe, William, M.D.
1828. Apr. 1.	Lance, John Henry, Esq. F.H.S. Holmwood, near Dorking, Surrey.
1840. Mar. 17.	Lankester, Edwin, M.D., LL.D., F.R.S., <i>Acad. Reg. Med. Matrit. Soc. Hon.</i> ; <i>Prof. Nat. Hist. New Coll. Lond.</i> 8 Savile-row. W.
1856. Nov. 18.	*Law, John Sutherland, Esq. F.H.S. Oriental Club, Hanover-square. W.
1812. Dec. 1.	*Le Conte, John, Esq. New York.
1855. Dec. 4.	*Lee, John, LL.D., F.R.S., F.S.A., V.P.R.Astr.S. 5 College, Doctors' Commons, E.C.; and Hartwell House, near Aylesbury, Bucks.
1845. Jan. 21.	*Leeks, Edward Frederick, Esq. 73 Warwick-square, Pimlico. S.W.
1835. Nov. 17.	*Lees, Edwin, Esq. Greenhill Summit, London-road, Worcester.
1855. Dec. 4.	Lester, Rev. Lester, F.G.S. Swanage, Dorset.
1857. Dec. 3.	Letheby, Henry, Esq. M.B., <i>Medical Officer to the City of London</i> ; <i>Prof. Chem. and Med. Jurispr. to Lond. Hosp. Med. School.</i> 41 Finsbury-square. E.C.
1820. Mar. 7.	Lindley, John, Ph.D., F.R.S., <i>Acad. Cæs. Nat. Cur., Socc. Reg. Bot. Ratisb., Reg. Hort. Berol., et Physiog. Lund. Socius</i> ; <i>Acad. Sc. Instit. Paris., et Reg. Sc. Berolin. Corresp.</i> ; <i>Acad. Amer. Bost., et Lyc. Hist. Nat. Nov.-Ebor. Soc. Hon.</i> ; <i>Sec. Hort. Soc.</i> Acton-green. W.
1858. Jan. 21.	*Lindsay, W. Lauder, M.D. Pitcullen House, Perth.
1839. Jan. 15.	*Lingwood, Robert Maulkin, Esq. M.A., F.G.S. Lyston, near Ross, Herefordshire.
1860. Mar. 15.	Little, George Greenway, Esq. F.Z.S. 2 Elm-court, Middle Temple. E.C.
1831. May 3.	*Llewelyn, John Dillwyn, Esq. F.R.S. and H.S. Penllergare, near Swansea.
1859. June 16.	*Llewelyn, John Talbot Dillwyn, Esq. Penllergare, near Swansea.
1835. June 16.	Lockwood, Rev. John William, M.A. Kingham, near Chipping Norton, Oxfordshire.
1857. Feb. 3.	Lowe, Edward Joseph, Esq. F.R.A.S., F.G.S. &c. Beeston Observatory, near Nottingham.
1851. June 3.	*Lowell, John Amory, Esq. Boston, Massachusetts.
1828. Nov. 4.	*Lubbock, Sir John William, Bart., M.A., F.R.S., G.S. and R. Astr. Soc. 11 Mansion-house-street. E.C.
1858. Jan. 21.	*Lubbock, John, Esq. F.R.S. and G.S. 11 Mansion-house-street. E.C.
1819. Mar. 16.	*Lyell, Sir Charles, M.A., D.C.L., Hon. M.R.S. Ed., F.R.S., V.P.G.S., <i>Acadd. Cæs. Nat. Cur. Soc.</i> ; <i>Reg. Sc. Berol. Corresp.</i> 53 Harley-street. W.
1847. Apr. 6.	*MacAndrew, Robert, Esq. F.R.S. Isleworth House, Isleworth. W.
1841. Jan. 19.	*McClelland, John, Esq. F.G.S., <i>Acad. Cæs. Nat. Cur. Soc.</i> ; <i>Surgeon, Bengal Army</i> , Calcutta.
1826. Apr. 4.	*Macdonald, William, M.D., F.R.S. Ed. and G.S., <i>Prof. Civ. and Nat. Hist.</i> St. Andrews.
1825. Nov. 1.	*MacIntyre, Æneas, LL.D.
1824. Nov. 16.	*Mackay, John B., Esq. Totteridge-green, Herts. N.

Date of Election.	
1860. Jan. 19.	*MacLeay, George, Esq. Athenæum. S.W.
1821. Apr. 17.	*MacLeay, Wm. Sharp, Esq. M.A., <i>Soc. Cæs. Nat. Cur. Mosq. et Nat. Scrutat. Berolin. Soc.</i> Sydney, New South Wales.
1857. Nov. 19.	Macpherson, George Gordon, Esq. (<i>late E.I.C.S.</i>) 63 Queen's-gardens, Hyde-park. W.
1840. Feb. 4.	*Mann, T. White, Esq. 5 Belgrave-terr., Upper Holloway. N.
1856. Jan. 15.	Mason, Nathaniel Haslope, Esq. 13 Bedford-row. W.C.
1827. June 5.	*Maund, Benjamin, Esq.
1860. Mar. 15.	Maw, George, Esq. Benthall Hall, Broseley, Shropshire.
1839. Apr. 2.	Miers, John, Esq. F.R.S., <i>Acad. Cæs. Nat. Cur. Soc.</i> Temple Lodge, Hammersmith. W.
1856. Feb. 19.	Miles, Rev. Charles Popham, M.A., M.D., <i>Principal of the Protestant Collège</i> , Malta.
1850. Jan. 15.	*Milligan, Joseph, Esq. Hobart Town, Van Diemen's Land.
1851. Feb. 18.	Moore, Thomas, Esq. F.H.S., <i>Curator of the Botanic Garden</i> , Chelsea. S.W.
1856. Feb. 5.	More, Alexander Goodman, Esq. Vectis Lodge, Bembridge, Isle of Wight.
1848. Dec. 5.	Morson, Thomas N. R., Esq., <i>President of the Pharmaceutical Society</i> . 38 Queen-square, Bloomsbury. W.C.
1841. Nov. 16.	*Mosley, Sir Oswald, Bart., D.C.L., F.G.S. and H.S. Rolleston Hall, near Burton-on-Trent.
1859. Jan. 20.	Müller, Ferdinand, M. and Ph.D., <i>Acad. Cæs. Nat. Cur., et Soc. Reg. Bot. Ratisb. Soc.; Pres. Philos. Instit.; Government Botanist, and Director of the Botanic Garden</i> , Melbourne.
1856. Jan. 15.	Mummery, John Rigden, Esq. 10 Cavendish-place. W.
1840. Mar. 17.	Munro, Col. William, C.B., <i>39th Regiment of Foot</i> . Stoke Bishop, near Bristol.
1859. May 5.	Munroe, Henry, M.D. Hull.
1827. Dec. 18.	*Murchison, Sir Roderick Impey, G.C.St.S., D.C.L., M.A., V.P.R.S., G.S. & R.G.S., Hon. M.R.S.Ed., R.I.A., C.P.S. & Imp. Geogr. Soc. Petersb.; <i>Acadd. Imp. Sc. Petrop., et Amer. Art. et Sc. Bost. Socius; Acadd. Sc. Inst. Paris., Reg. Taurin. et Reg. Berolin. Corresp.; Soc. Imp. Nat. Cur. Mosq. Socius; Director-General of the Geological Survey of the United Kingdom</i> . 16 Belgrave-square. S.W.
1849. Feb. 20.	*Nash, Davyd W., Esq. Brandon Villa, The Park, Cheltenham.
1843. Jan. 17.	Neison, Francis G. P., Esq. 13 Queen Anne-street, Cavendish-square. W.
1833. Feb. 5.	*Newman, Edward, Esq., <i>Acad. Cæs. Nat. Cur. Soc.</i> 9 Devonshire-street, Bishopsgate. N.E.
1857. Mar. 3.	Newton, Alfred, Esq. M.A. Elveden Hall, Thetford, Suffolk.
1828. Feb. 19.	Nicholl, Iltvd, Esq. Uske, Monmouthshire.
1812. Nov. 3.	*Nichols, John Bowyer, Esq. F.S.A. and H.S. 25 Parliament-street, Westminster. S.W.
1853. Feb. 1.	Oliver, Daniel, Esq., <i>Librarian to the Royal Gardens</i> , 3 Cumberland-place, Kew. W.
1825. Feb. 15.	*Ord, George, Esq., <i>Soc. Amer. et Acad. Sc. Philad. Soc.</i> Philadelphia.
1846. Mar. 17.	*Osborn, Samuel, Esq. Stockwell-park, Brixton. S.
1843. Jan. 17.	*Osborn, William, Esq. Nurseries, Fulham. S.W.

Date of Election.

1836. Mar. 1. *OWEN, RICHARD, Esq. D.C.L., F.R.S. and G.S., Hon. M.R.S. Ed., *Ord. Boruss. 'pour le mérite' Eq. ; Chevalier de la Légion d'Honneur; Acad. Sc. Inst. Paris. Socius; Imper. Sc. Petrop., et Reg. Sc. Berolin. Corresp.* British Museum. W.C. VICE-PRESIDENT.
1824. Apr. 6. *Owen, Robert Brisco, M.D. Haulfre, Beaumaris, Anglesea.
1845. Jan. 21. *Packman, John Daniel Vittoria, M.D. Puckeridge, Herts.
1860. Jan. 19. Parfitt, Henry, M.D. 29A Pall Mall. S.W.
1842. Nov. 15. Parry, Major Frederick John Sidney. 5 Terrace, Worthing.
1852. June 15. Pascoe, Francis P., Esq. Campden-hill, Kensington. W.
1831. Nov. 15. *Paxton, Sir Joseph, M.P., F.H.S. Rock House, Sydenham. S.E.
1827. Feb. 20. *Peckover, Algernon, Esq. Wisbeach, Cambridgeshire.
1837. Mar. 7. Perkins, Houghton, Esq. 25 Mortimer-street, Cavendish-square. W.
1847. June 15. Phillips, Edward, M.D., M.R. Coll. Phys. & Surg. Coventry.
1845. Mar. 4. Plomley, Francis, M.D. Maidstone, Kent.
1857. May 5. Pollock, George David, Esq. F.R.C.S., *Assist. Surg. to St. George's Hospital.* 27 Grosvenor-street. W.
1857. Jan. 20. Polyblank, George Henry, Esq. 55 Gracechurch-street. E.C.
1836. Apr. 5. Potter, Henry Glassford, Esq. F.G.S. Hampton. S.W.
1844. June 4. Potter, Jephson, M.A., M.D., M.R. Coll. Phys. & Surg., F.R. Med. Chir. and Obstetr. Soc. Sussex House, Pittville, Cheltenham.
1853. Feb. 15. Powell, Lewis, M.D., F.S.A., F.R.G.S. Civil Medical Service, Mauritius.
1829. June 16. *Pratt, Samuel Peace, Esq. F.R.S. and G.S. 1 Canonbury-lane, Islington. N.
1859. May 5. *Prentis, Charles, Esq., *Assist. Surg. 7th Punjaub Infantry.* Jullundur.
1845. Mar. 4. Price, David, M.D., F.R.C.S. Margate.
1813. Dec. 21. *Prideaux, Charles, Esq. Kingsbridge, Devon.
1851. May 6. *Prior, Richard Chandler Alexander, M.D. 48 York-terrace, Regent's-park. N.W.
1828. Apr. 1. *Probart, Francis George, M.D. Bury, Suffolk.
1857. Mar. 17. Quekett, John Thomas, Esq. F.R.S., *Conservator of Hunter. Mus., and Prof. Histol., Royal College of Surgeons,* Lincoln's Inn Fields. W.C.
1821. Nov. 20. *Quigley, Thomas Haswell, Esq., *Surgeon Royal Artillery,* Dublin.
1825. Nov. 15. *Quiros, Francis, Esq. F.G.S. Lima.
1840. Jan. 21. *Rankine, James, M.D. Otterden, near Maypole, Ayrshire.
1858. Dec. 2. Ratcliff, Charles, Esq. F.A.S., G.S. and H.S. Wyddrington, Edgbaston, Birmingham.
1833. Dec. 3. *Read, William Henry Rudston, Esq. M.A., F.H.S. Yorkshire Club, York.
1846. Dec. 15. Reeve, Lovell, Esq. F.G.S., *Lyc. Hist. Nat. Nov.-Ebor., et Soc. Hist. Nat. Wirtemb. Corresp.* 5 Henrietta-street, Covent-garden. W.C.
1832. Apr. 3. *Reeves, John Russell, Esq. F.R.S. and H.S. 11 King's Arms-yard, Moorgate-street. E.C.

Date of Election.	
1825. Feb. 15.	*Richardson, Sir John, C.B., M.D., F.R.S. L. & E., <i>Acad. Sc. Nat. Philad., et Soc. Geogr. Paris. Corresp.; Socc. Hist. Nat. Montreal., Lit. et Phil. Quebec., et Hist. Nat. Boston. Soc. Hon.</i> Lancrigg, Grasmere, Westmoreland.
1826. Dec. 5.	Rigby, Edward, M.D., F.R. Coll. Phys., <i>Socc. Imp. et Reg. Med. Vindob., Reg. Med.-Chirurg. Berol., Reg. Med. Hafn., et Med. Suec. Socius</i> ; Corresp. Memb. Nat. Inst. U.S.; <i>Senior Physician to the General Lying-in Hospital; Examiner at the University of London.</i> 36 Berkeley-sq. W.
1847. Dec. 21.	Rix, Joseph, M.D., F.R.C.S. St. Neots, Huntingdonshire.
1801. May 25.	*Robinson, Robert Robinson Watson, M.D. St. James's-sq., Manchester.
1854. Nov. 7.	Robinson, Thomas Fleming, Esq. F.R.G.S. 2 Horatio-terrace, Ormond-road, Old Kent-road. S.E.
1806. Nov. 18.	*Roches, John James de, M.D. Geneva.
1827. Feb. 6.	*Rodwell, William, Esq. Ipswich.
1828. Apr. 1.	*Roe, John Septimus, Esq. <i>Surveyor General</i> , Swan River, Australia.
1859. June 16.	Rolleston, George, M.D. Pembroke College, Oxford.
1834. Dec. 2.	*Rookin, Rev. Henry, M.A. Upton Gray, near Odiham, Hants.
1847. June 1.	Roots, Sudlow, Esq. Kingston, Surrey. S.W.
1857. June 2.	*Roper, Freeman C.S., Esq. F.G.S. Pembury-rd., Clapton. N.E.
1824. Feb. 3.	*Ross, <i>Admiral</i> Sir James Clark, <i>Royal Navy</i> , D.C.L., F.R.S., <i>Acad. Sc. Instit. Paris. Corresp.; Soc. Reg. Sc. Hafn. Soc.</i> Aston Abbots House, Aylesbury.
1847. May 4.	Rothery, Henry Cadogan, Esq. M.A. 94 Gloucester-terrace, Hyde-park. W.
1840. Apr. 7.	Rucker, Sigismund, Esq. F.H.S. West-hill, Wandsworth. S.W.
1823. Nov. 4.	*Russell, Jesse Watts, Esq. D.C.L., F.R.S., S.A., G.S. and H.S. Ilam Hall, Staffordshire.
1857. Jan. 20.	Sabine, Major-General Edward, R.A., Treas. and V.P.R.S., Hon. M.C.P.S., <i>Acad. Reg. Sc. Berol. Soc. Hon.</i> 13 Ashley-place, Victoria-street, Westminster. S.W.
1853. June 21.	Salter, S. James A., Esq. M.B. Lond. 1 Plowden-buildings, Middle Temple. E.C.
1858. Apr. 15.	*Saunders, William Frederick, Esq. Hillfield House, Reigate.
1833. Nov. 5.	SAUNDERS, WILLIAM WILSON, Esq. F.R.S., Treas. H.S. Hillfield House, Reigate. VICE-PRESIDENT.
1829. Mar. 4.	*Schenley, Edward Wyndham Harrington, Esq. Havannah.
1856. Nov. 18.	Sclater, Philip Lutley, Esq. M.A., <i>Secr. Zool. Soc.</i> 11 Hanover-square. W.
1829. Jan. 20.	Scouler, John, M.D. Glasgow.
1852. Nov. 16.	Seemann, Berthold, Ph.D., <i>Acad. Cæs. Nat. Cur. V.P.</i> 22 Canonbury-square, Islington. N.
1826. Jan. 17.	*Selby, Prideaux John, Esq. F.G.S. Twizel House, near Belford, Northumberland.
1848. June 20.	Shaw, John, M.D., F.G.S. Walmsgate, near Louth, Lincolnshire.
1859. Apr. 7.	Sheppard, Edw., Esq. 5 Ladbroke-place, Notting-hill. W.
1858. Jan. 21.	Shillitoe, Buxton, Esq. F.R.C.S. 34 Finsbury-circus. E.C.
1860. Mar. 15.	Shortt, John, M.D., <i>of H. M. Indian Army</i> , Madras.
1856. Jan. 15.	*Shuttleworth, Robert James, Esq. Berne, Switzerland.
1857. Jan. 20.	Sinclair, Andrew, M.D., R.N. Auckland, New Zealand.

Date of Election.	
1812. Nov. 3.	*Skey, Joseph, M.D., <i>Physician to the Forces.</i>
1843. Mar. 7.	*Solly, William Hammond, Esq. M.A., F.H.S. Frome Whitefield, Dorchester, Dorset.
1806. Apr. 1.	*South, Sir James, F.R.S. L. and E., M.R.I.A., Hon. M.C.P.S., <i>Acad. Imper. Sc. Petrop. Soc. Hon.</i> Campdenhill, Kensington. W.
1844. May 6.	Sowerby, George Brettingham, Esq. 9 Pembroke-square, Kensington. W.
1823. Feb. 18.	Sowerby, James de Carle, Esq., <i>Secretary of the Royal Botanic Society</i> , Regent's-park. N.W.
1812. Dec. 1.	*Spalding, Hinton, M.D. Kingston, Jamaica.
1857. Nov. 19.	*Speer, Wilfred Dakin, Esq. Thames Ditton, Surrey. S.W.
1827. Feb. 6.	*Spence, Rev. George, LL.D. Lee, Blackheath. S.E.
1858. Feb. 4.	Squire, Peter, Esq. 277 Oxford-street. W.
1845. Apr. 15.	*Staines, Frederick, Esq. San Luis Potosi, Mexico.
1859. Jan. 20.	*Stainton, Henry Tibbats, Esq. Mountsfield, Lewisham. S.E.
1854. Apr. 4.	Stainton, James Joseph, Esq. Horsell, near Ripley, Surrey.
1850. Dec. 3.	Stevens, Samuel, Esq., <i>Treasurer of the Entomological Society</i> , 24 Bloomsbury-street. W.C.
1859. Jan. 20.	*Strachey, Major Richard, F.R.S., <i>Bengal Engineers, Secretary to the Government of India</i> , Calcutta.
1833. Apr. 16.	*Sturt, Capt. Charles. South Australia.
1825. Jan. 18.	*Such, George, M.D.
1834. May 6.	*Sutcliffe, Joshua, Esq. Fir Grove, Burnley, Lancashire.
1854. Mar. 21.	Syme, John Thomas, Esq., <i>Lecturer on Botany at the Westminster and Charing Cross Hospitals</i> . 12 Gordon-street, Gordon-square. W.C.
1855. May 1.	*Tagart, Francis, Esq. 31 Craven-hill-gardens, Hyde-park. W.
1850. Jan. 15.	Talbot, Christopher Rice Mansel, Esq. M.P., F.R.S. 3 Cavendish-square, W. ; and Margam, Glamorganshire.
1829. Feb. 3.	*Talbot, Henry Fox, Esq. F.R.S. and H.S. Lacock Abbey, Wilts.
1856. Apr. 1.	Tanner, Thomas Hawkes, M.D., F.R. Med. Chir. Soc. 10 Charlotte-street, Bedford-square. W.C.
1837. Nov. 7.	*Taylor, John, Esq. F.R.S. and G.S. 31 Chester-terrace, Regent's-park. N.W.
1838. Mar. 20.	*Teale, Thomas Pridgin, Esq. 22 Albion-street, Leeds.
1850. Feb. 5.	Tebbitt, Walter, Esq.
1817. Jan. 21.	*Temple, William, Esq. Bishopstow, Warminster, Wilts.
1827. Dec. 4.	*Thompson, Chas. John, Esq. 22 George-st., Hanover-sq. W.
1829. Mar. 4.	Thomson, John, M.D. 364 City-road. E.C.
1852. Mar. 2.	*Thomson, Thomas, M.D., F.R.S. and H.S., <i>Acad. Cæs. Nat. Cur. Soc., Surgeon Bengal Army ; Superintendent of the Botanic Garden</i> , Calcutta.
1853. Feb. 1.	Thomson, William, Esq. City of London Club, Old Broad-street, City. E.C.
1854. Jan. 17.	*Thwaites, George Henry Kendrick, Esq., <i>Superintendent of the R. Botanic Garden</i> , Peradenia, Ceylon.
1829. Feb. 17.	Tingle, Thomas, Esq. Apothecaries' Hall. E.C.
1823. Nov. 4.	*Tomkins, Charles, M.D. Weston-super-Mare, Somersetshire.
1855. Dec. 4.	Townley, James, Esq. Harleyford-place, Kennington-park. S.
1857. Mar. 3.	Tristram, Rev. Henry Baker, M.A. Castle Eden, Durham.
1843. June 6.	*Tulloch, James, Esq. F.R.S. and S.A. 16 Montague-place, Russell-square. W.C.

Date of Election.	
1843. June 6.	*Turner, Thomas, Esq. Mosley-street, Manchester.
1849. Nov. 20.	Tylor, Alfred, Esq. F.G.S. Paradise-row, Stoke Newington. N.
1831. Nov. 15.	*Valentine, William, Esq. Campbell Town, Van Diemen's Land.
1853. Mar. 15.	*Van Voorst, John, Esq. 1 Paternoster-row. E.C.
1855. Apr. 17.	Vinen, Edw. Hart, M.D. 6 Chepstow Villas West, Bayswater. W.
1860. May 3.	Wainwright, James Gadesden, Esq. The Eukestons, Clapham-common. S.
1856. June 17.	*Wainwright, Joseph, Esq. Wakefield.
1827. Apr. 3.	*Wakefield, Felix, Esq. 38 Edwardes-square, Kensington. W.
1838. June 19.	Wakefield, Robert, Esq. 11 Sussex-place, Regent's-park. N.W.
1832. Mar. 6.	*Walker, Francis, Esq. Rectory House, The Grove, Highgate. N.
1858. Dec. 2.	Walker, James Sidney, Esq. Hunsdon Bury, near Ware.
1827. Dec. 4.	*Walker, Joseph, Esq. Eton Lodge, near Liverpool.
1860. Feb. 2.	Wallich, George Charles, M.D., <i>late of H. M. Indian Army.</i> 17 Campden-hill-road, Kensington. W.
1845. Feb. 18.	*Walton, John, Esq. Knaresborough, Yorkshire.
1817. Jan. 21.	*Ward, Nathaniel Bagshaw, Esq. F.R.S. Clapham-rise. S.
1860. Jan. 19.	Ward, Samuel Neville, Esq. <i>Mad. Civil Serv.</i> , Coimbatore, India.
1824. Apr. 6.	Waring, Richard, M.D. Marlings, near Chislehurst, Kent. S.E.
1834. Mar. 18.	Watson, Hewett Cottrell, Esq., <i>Acad. Cæs. Nat. Cur. Soc.</i> Thames Ditton, Kingston. S.W.
1859. Apr. 21.	Watson, John Forbes, Esq., A.M., M.D. India House. E.C.
1858. Jan. 21.	Webb, Francis Cornelius, M.D., F.S.A. 39 Great Coram-st. W.C.
1860. Jan. 19.	West, Tuffen, Esq. 8 Hemblington Cottages, Queen's-road, Dalston. N.E.
1827. May 1.	*Westwood, John Obadiah, Esq. M.A., <i>Acad. Cæs. Nat. Cur., Socc. Cæs. Nat. Cur. Mosq., et Physiogr. Lund. Soc.</i> Taylor Institute, Oxford.
1823. Dec. 16.	*Wheeler, J. Lowe, Esq. 9 Vassall Villas, Holland-rd., Brixton. S.
1839. Mar. 19.	White, Alfred, Esq. West Drayton.
1832. Jan. 17.	*Wight, Robert, M.D., F.R.S. and H.S., <i>Acad. Cæs. Nat. Cur., et Soc. Reg. Bot. Ratisb. Soc., late Surgeon, Madras Army.</i> Grazeley Lodge, Reading.
1811. Dec. 3.	*Wilkin, Simon, Esq. Cossey Cottage, Hampstead. N.W.
1837. Feb. 7.	Wilkinson, J. Sheldon Craddock, Esq. Great Marlow, Bucks.
1859. June 16.	*Williams, David, Esq. 56 Wind-street, Swansea.
1855. Apr. 17.	Williams, Thomas, M.D., F.R.S. Swansea.
1846. Nov. 17.	Williams, William White, M.D., <i>Resident Physician to the Lunatic Asylum</i> , Gloucester.
1814. Nov. 1.	*Windsor, John, Esq. Piccadilly, Manchester.
1847. Mar. 2.	*Wollaston, Thomas Vernon, Esq. M.A., F.C.P.S. King's Kerswell, Newton Abbots, Devon.
1854. Jan. 17.	Wood, Rev. John G., M.A. St. Bartholomew's Hosp. E.C.
1801. July 22.	*Woods, Joseph, Esq. F.S.A. and G.S. Priory-crescent, South- over, Lewes.
1859. Feb. 17.	Wright, E. Perceval, A.M., M.B., M.R.I.A., <i>Lecturer on Zoology, and Director of the Museum</i> , 5 Trin. Coll., Dublin.
1822. Dec. 17.	*Yates, James, Esq. M.A., F.R.S. and G.S. Lauderdale House, Highgate. N.
1829. June 16.	*Younge, Robert, Esq. Sheffield.

FOREIGN MEMBERS.

Date of Election.		
1844. May	7.	Agassiz, D. Ludovicus, <i>Soc. Reg. Lond. Soc.</i> ; <i>Acad. Sc. Institut. Paris. Corresp.</i> ; <i>Prof. in Univ. Harvardensi</i> , Cantabrigiæ, Novæ-Angliæ.
1845. May	6.	Amici, D. Johannes Baptista, <i>Astronomiæ in Mus. Imp. Reg. Prof.</i> , Florentiæ.
1841. May	4.	Baer, D. Carolus Ernestus de, M.D., <i>Acad. Imp. Sc. Petrop. et Soc. Reg. Lond. Soc.</i> Petropoli.
1854. May	2.	Beneden, D. P. J. de, <i>Zool. et Anat. Comp. Prof.</i> , Lovanii.
1835. May	5.	Bertoloni, D. Antonius, M.D., <i>Bot. Prof.</i> , Bononiæ.
1833. May	7.	Blume, D. Carolus Ludovicus, M.D., <i>Acad. Reg. Sc. Amstel. Soc.</i> ; <i>Acad. Sc. Institut. Paris. Corresp.</i> Lugduni-Bata- vorum.
1860. May	3.	Boissier, D. Edmundus, <i>Soc. Phys. et Hist. Nat. Genev. Soc.</i> , Genevæ.
1859. May	5.	Brandt, D. Johannes Fridericus, <i>Zool. Prof.</i> , Petropoli.
1852. May	4.	Braun, D. Alexander, <i>Acad. Reg. Sc. Berolin. Soc.</i> ; <i>Bot. Prof. et Hort. Reg. Bot. Director</i> , Berolini.
1833. May	7.	Brongniart, D. Adolphus Theodorus, M.D., <i>Institut. Paris. et Soc. Reg. Lond. Soc.</i> ; <i>Bot. Prof.</i> , Parisiis.
1851. May	6.	Burmeister, D. Hermannus, M. et Ph.D., <i>Acad. Cæs. Nat. Cur. Soc.</i> ; <i>Zool. Prof.</i> , Halæ.
1850. May	7.	Candolle, D. Alphonsus de, <i>Acad. Sc. Institut. Paris. Corresp.</i> Genevæ.
1839. May	7.	Carus, D. Carolus Gustavus, M.D., <i>Acad. Cæs. Nat. Cur. Soc.</i> , Dresdæ.
1854. May	2.	Dana, D. Jacobus D., A.M., LL.D., New-Haven, Novæ-Angliæ.
1848. May	2.	Decaisne, D. Josephus, <i>Acad. Sc. Institut. Paris. Soc.</i> ; <i>Agric. Prof.</i> , Parisiis.
1845. May	6.	Deshayes, D. G. P. Parisiis.
1854. May	2.	Duméril, D. Andr. Mar. Const., <i>Acad. Sc. Institut. Paris. Soc.</i> ; <i>in Mus. Hist. Nat. Prof.</i> , Parisiis.
1839. May	7.	Edwards, D. Henricus Milne, M.D., <i>Institut. Paris. et Soc. Reg. Lond. Soc.</i> ; <i>in Mus. Hist. Nat. Prof.</i> , Parisiis.
1831. May	3.	Ehrenberg, D. Christianus Gothofredus, M.D., <i>Acad. Reg. Sc. Berolin. et Soc. Reg. Lond. Soc.</i> ; <i>Acad. Sc. Institut. Paris. Corresp.</i> Berolini.
1835. May	5.	Fries, D. Elias, M.D., <i>Acad. Reg. Sc. Holm. Soc.</i> ; <i>Œcon. Prof.</i> , Upsaliæ.
1855. May	1.	Göppert, D. Henricus Robertus, M.D., <i>Acad. Cæs. Nat. Cur. Soc.</i> ; <i>Med. Prof.</i> , Vratislaviæ.
1850. May	7.	Gray, D. Asa, M.D., <i>Acad. Amer. Secr.</i> ; <i>Hist. Nat. Prof. in Univ. Harvardensi</i> , Cantabrigiæ, Novæ-Angliæ.

Date of Election.		
1859. May	5.	Grisebach, D. Augustus Henricus Rudolphus, <i>Soc. Reg. Gott. Soc. ; Bot. Prof.</i> , Gottingæ.
1851. May	6.	Gussone, D. Johannes, <i>Acad. Reg. Sc. Neapol. Soc. ; Hort. Reg. Bot. Director</i> , Neapoli.
1835. May	5.	Herold, D. Mauritius, M.D., <i>Hist. Nat. Prof.</i> , Marpurgi.
1857. May	5.	Hoeven, D. Janus van der, <i>Acad. Reg. Sc. Amstelod. Soc. ; Hist. Nat. Prof.</i> , Leidæ.
1855. May	1.	Hofmeister, D. Gulielmus. Lipsiæ.
1858. May	6.	Kölliker, D. Albertus, <i>Anat. Comp. et Physiol. Prof.</i> Herbipoli.
1859. May	5.	Lovèn, D. Samuelus L., <i>Acad. Reg. Sc. Holm. Soc. ; Zool. Prof.</i> Holmiæ.
1827. May	1.	Martius, D. Carolus Frid. Philippus de, M.D., <i>Acad. Reg. Sc. Monac. Secr. ; Soc. Reg. Lond. Soc. ; Acad. Sc. Inst. Paris. Corresp. ; Hort. Reg. Bot. Monac. Director.</i> Monachii.
1857. May	5.	Meisner, D. Carolus Fridericus, M. et Ph.D. ; <i>Acad. Cæs. Nat. Cur. Soc. ; Bot. Prof. et Hort. Bot. Director</i> , Basileæ.
1854. May	2.	Miquel, D. Fridericus Antonius Gulielmus, <i>Acad. Reg. Sc. Amstel. Secr. ; Bot. Prof.</i> , Amstelodami.
1837. May	2.	Mohl, D. Hugo, M.D., <i>Acad. Sc. Inst. Paris. Corresp. ; Bot. Prof.</i> , Tubingæ.
1854. May	2.	Montagne, D. Johannes Franciscus Camillus, <i>Acad. Sc. Instit. Paris. Soc.</i> Parisiis.
1841. May	4.	Neovidiaæ Princeps, Sereniss. Maximilianus.
1855. May	1.	Planchon, J. E., Ph.D., <i>Bot. Prof.</i> Monspeli.
1851. May	6.	Purkinje, D. Johannes E., M.D., <i>Soc. Reg. Lond. Soc. ; in Univ. Vratisl. Prof.</i> Pragæ.
1851. May	6.	Roeper, D. Johannes, M.D., <i>Bot. Prof.</i> , Rostochii.
1831. May	3.	Rüppell, D. Edvardus, M.D. Francofurti ad Moenum.
1860. May	3.	Sars, D. M., Ph.D. Manger, prope Bergen, Norvegiæ.
1853. May	3.	Schlechtendal, D. Diedericus Fridericus Ludovicus de, M. et Ph.D., <i>Hort. Bot. Halensis Director ; Bot. Prof.</i> , Halæ.
1844. May	7.	Schleiden, D. M. J., <i>Bot. Prof.</i> , Jenæ.
1858. May	6.	Siebold, D. Carolus Theodoricus Ernestus de, <i>Soc. Reg. Lond. Soc. ; Zool. et Anat. Comp. Prof.</i> , Monachii.
1827. May	1.	Tiedemann, D. Fridericus, M.D., <i>Soc. Reg. Lond. et Acad. Sc. Inst. Paris. Soc. ; Zool. Prof.</i> , Monachii.
1839. May	7.	Torrey, D. Johannes, M.D., <i>Bot. et Chem. Prof.</i> , Novi-Eboraci.
1830. May	4.	Treviranus, D. Ludovicus Christianus, M.D., <i>Acad. Sc. Inst. Paris. Corresp. ; Bot. Prof.</i> , Bonnæ.
1853. May	3.	Tulasne, D. Ludovicus Renatus, <i>Acad. Sc. Instit. Paris. Soc. ; Bot. in Mus. Hist. Nat. Adjutor</i> , Parisiis.
1852. May	4.	Unger, D. Franciscus, M.D., <i>Acad. Imp. Sc. Vind. Soc. ; Bot. Prof.</i> , Vindobonæ.
1859. May	5.	Weddell, D. Hugo Algernon, M.D., Therm. Bigorr.

ASSOCIATES.

Date of Election.

1817. May 6. Baxter, Mr. William, Botanic Garden, Oxford.
1806. Jan. 20. Bingham, Mr. Nathaniel.
1840. Mar. 3. Bird, Frederic John, M.D. 62 Park-street. W.
1858. Mar. 4. Black, Mr. Allan, *Curator of the Herbarium*, Royal Gardens, Kew. W.
1825. June 21. Booth, Mr. William Beattie, *Assist. Sec. Hort. Soc.* 8 St. Martin's-place. W.C.
1842. Dec. 7. Brett, John, M.D. Madras.
1829. Jan. 20. Campbell, Mr. Alexander, Botanic Garden, Manchester.
1833. Jan. 15. Corder, Mr. Thomas, jun. Bedford.
1825. Jan. 18. Dacre, Rev. Bartholomew, Moseley, near Manchester.
1843. Dec. 19. Denny, Mr. Henry, *Assist. Cur. Phil. Soc.* Leeds.
1832. Feb. 21. Denson, Mr. John, Waterbeach, Cambridgeshire.
1839. Feb. 19. Dickie, George, A.M., M.D., *Prof. Nat. Hist. Queen's Coll.*, Belfast.
1834. Apr. 15. Drake, Rev. William Fitt, M.A. West Halton, Brigg, Lincolnshire.
1810. Jan. 16. Drummond, Mr. James, Swan River, Australia.
1832. Jan. 17. Forbes, Mr. James, Woburn Abbey, Bedfordshire.
1848. May 2. Fraser, Mr. John, Harcourt Villa, St. John's-wood. N.W.
1841. Feb. 16. Gordon, Mr. George, Turnham-green. W.
1849. Mar. 20. Gosse, Mr. Philip Henry, F.R.S. Marychurch, near Torquay, Devon.
1845. Feb. 18. Hall, Mr. Thomas.
1846. Nov. 17. Hanson, Mr. William.
1829. Apr. 7. Harrison, Mr. Robert, New York.
1842. Nov. 1. Henderson, Mr. Joseph, F.H.S. Wentworth, Yorkshire.
1823. Dec. 2. Hodson, Mr. Nathaniel Shirley, *Curator of the Botanic Garden*, Bury St. Edmunds.
1814. Mar. 15. Hogg, Mr. Thomas, New York.
1838. June 5. Jenner, Mr. Edward, 2 West-street, Lewes.
1842. Apr. 5. KIPPIST, Mr. RICHARD, *Acad. Nat. Sc. Philad. Corresp.* Burlington House, Piccadilly. W. CLERK and LIBRARIAN.
1831. Jan. 18. Lear, Mr. Edward.
1806. Dec. 2. Mackay, James Townsend, LL.D., M.R.I.A., *Curator of the Botanic Garden*, Trinity College, Dublin.
1854. Apr. 4. M^cIntosh, Mr. Charles, Newcome Villa, Murrayfield, Edinburgh.
1832. Dec. 4. Mallard, Lieut. Charles, R.N. 6 Clarence-parade, Southsea, Portsmouth.

Date of Election.		
1847. Jan. 19.	Mitten, Mr. William,	Hurst-pierpoint, Sussex.
1840. Feb. 4.	Moore, Mr. David,	Botanic Garden, Glasnevin.
1830. Jan. 19.	Pamplin, Mr. William,	45 Frith-street, Soho. W.
1821. Dec. 4.	Peete, Rev. William Wilcox, M.A.	12 Lambridge-place, Bath.
1856. June 3.	Penney, Mr. William,	Poole, Dorset.
1821. Dec. 4.	Pulling, Rev. William,	19 New-square, Cambridge.
1842. Nov. 1.	Ralph, Mr. Thomas Shearman,	M.R.C.S. Melbourne.
1829. Mar. 17.	Rennie, Mr. James, A.M.	Sydney, New South Wales.
1854. Feb. 21.	Robson, Mr. Joseph,	Whitehaven.
1842. Nov. 15.	Salter, Mr. John William, F.G.S.	97 Gloucester-place, Kentish- town. N.W.
1843. May 2.	Sansom, Mr. Thomas,	Custom House, Liverpool.
1837. Apr. 18.	Smith, Mr. John, <i>Acad. Cæs. Nat. Cur. Soc.</i>	Royal Botanic Gardens, Kew. W.
1839. Dec. 3.	Stobbs, Rev. William, A.M.	Stromuess, Orkney.
1827. Feb. 6.	Traill, Mr. James,	Cairo, Egypt.
1858. Dec. 2.	Welwitsch, Frederick,	M.D.
1841. Jan. 19.	Westcott, Mr. Frederick,	Birmingham.
1842. Nov. 15.	Woodward, Mr. Samuel P., F.G.S.	40 Up.Park-st., Islington.N.
1821. June 19.	Youell, Mr. John,	Great Yarmouth.

* * Omissions having occasionally occurred in the Annual List of Deceased Members as announced from the Chair at the Anniversary Meetings, any information on that subject, as also notice of changes of Residence, &c., may be addressed to Mr. Kippist, the Librarian.

T R A N S A C T I O N S.

The Fellows are entitled to receive, *gratis*, all Volumes, or Parts of Volumes, of the Transactions and Journal, that may be published after their Election, if they shall have made Composition in lieu of Annual Payments, or after they shall have paid one yearly Contribution: and they may be supplied with any of the Volumes published before their Election, at a reduction of 25 per cent. under the common selling prices.

The set of the first twenty vols. of the Transactions will be supplied to Fellows at the price of £20 : 0 : 0.

Members are requested to apply at the Apartments of the Society, to Mr. Kippist, Librarian, for such volumes as they may be entitled to, or be desirous to purchase: but no Volume can be delivered *gratis* to a Fellow whose yearly Contributions are in arrear, nor can any be delivered unless applied for within five years from the time of publication.

Communications intended to be made to the Society may be addressed to the President, or to the Secretary, at the Society's Apartments, Burlington House, Piccadilly, London.

CHARTER
AND
BYE-LAWS
OF THE
LINNEAN SOCIETY OF LONDON.



LONDON :

PRINTED FOR THE SOCIETY,

BY TAYLOR AND FRANCIS, RED LION COURT, FLEET STREET.

1861.

CONTENTS.

	Page
CHARTER, - - - - -	5
BYE-LAWS.	
CHAPTER I.	
<i>Of the Election and Admission of Fellows,</i> - - -	11
CHAPTER II.	
<i>Of the Payments to be made by the Fellows,</i> - - -	13
CHAPTER III.	
<i>Of the Honorary Members,</i> - - - - -	14
CHAPTER IV.	
<i>Of the Foreign Members,</i> - - - - -	ib.
CHAPTER V.	
<i>Of the Associates,</i> - - - - -	15
CHAPTER VI.	
<i>Of the Death or Withdrawing of Members,</i> - - -	16
CHAPTER VII.	
<i>Of the Causes and Form of Ejection,</i> - - - - -	ib.
CHAPTER VIII.	
<i>Of the Election of the Council and Officers,</i> - - -	17
CHAPTER IX.	
<i>Of the President,</i> - - - - -	19
CHAPTER X.	
<i>Of the Treasurer and his Accounts,</i> - - - - -	ib.

CHAPTER XI.		
<i>Of the Secretaries,</i>	- - - - -	Page 21
CHAPTER XII.		
<i>Of the Librarian and other Salaried Officers,</i>	- - - - -	ib.
CHAPTER XIII.		
<i>Of the General or Ordinary Meetings of the Society,</i>	- - - - -	22
CHAPTER XIV.		
<i>Of the Meetings of the Council,</i>	- - - - -	23
CHAPTER XV.		
<i>Of the Manner of Publication of the Papers laid before the Society,</i>	- - - - -	24
CHAPTER XVI.		
<i>Of the Books and Papers of the Society,</i>	- - - - -	25
CHAPTER XVII.		
<i>Of the Common Seal and Deeds,</i>	- - - - -	ib.
APPENDIX.		
No. 1. <i>Form of a Balloting-List for the Council,</i>	- - - - -	26
No. 2. <i>Form of a Balloting-List for the Officers,</i>	- - - - -	27

CHARTER

OF THE

LINNEAN SOCIETY OF LONDON.

GEORGE THE THIRD, by the Grace of God, of the United Kingdom of Great Britain and Ireland King, Defender of the Faith, To all to whom these Presents shall come, greeting. WHEREAS several of Our loving Subjects are desirous of forming a Society for the Cultivation of the Science of Natural History in all its Branches, and more especially of the Natural History of Great Britain and Ireland, and, having subscribed considerable Sums of Money for that Purpose, have humbly besought Us to grant unto them, and such other Persons as shall be approved and elected, as hereinafter is mentioned, Our Royal Charter of Incorporation for the Purposes aforesaid; KNOW YE, that We, being desirous to promote every Kind of Improvement in the Arts and Sciences, have, of Our especial Grace, certain Knowledge, and mere Motion, given and granted, and We do hereby give and grant, that Our right trusty and right well beloved Cousin and Counsellor *George* Earl of *Dartmouth*, Our trusty and well beloved *James Edward Smith* Doctor of Physick, *Thomas Marsham* Esquire, *Alexander MacLeay* Esquire, *Jonas Dryander* Esquire, The Reverend *Samuel Goodenough* Doctor of Laws, *Aylmer Bourke Lambert* Esquire, *Richard Anthony Salisbury* Esquire, *William George Maton* Doctor of Physick, *Thomas Furlly Forster* Esquire, *Charles Hatchett* Esquire, *William Lewis* Esquire, The Reverend *Thomas Rackett* Clerk, *John Symmons* Esquire, and *Thomas Young* Doctor of Physick, and such others as shall, from Time to Time, be appointed and elected, in the Manner hereinafter directed, and their Successors, be and shall for ever hereafter continue and be, by virtue of these Presents, one Body Politic and Corporate, by the Name of "THE LINNEAN

Object of the Society.

Incorporation.

Corporate Name.

SOCIETY OF LONDON ;” and them and their Successors for the Purposes aforesaid, WE do hereby constitute and declare to be one Body Politic and Corporate, and by the same Name to have perpetual Succession, and for ever hereafter to be Persons able and capable in the Law, and have Power to purchase, receive, and possess any Goods and Chattels whatsoever, and (notwithstanding the Statutes of Mortmain) to purchase, hold, and enjoy, to them and their Successors, any Lands, Tenements, and Hereditaments whatsoever, not exceeding, at the Time or Times of purchasing such Lands, Tenements, and Hereditaments, respectively, the yearly Value, at a Rack Rent, of One Thousand Pounds in the whole, without incurring the Penalties or Forfeitures of the Statutes of Mortmain, or any of them; And, by the Name aforesaid, to sue and be sued, plead and be impleaded, answer and be answered unto, defend and be defended, in all Courts and Places whatsoever of Us, Our Heirs and Successors, in all Actions, Suits, Causes, and Things whatsoever, and to act and do in all Things relating to the said Corporation in as ample Manner and Form as any other our liege Subjects, being Persons able and capable in the Law, or any other Body Politic or Corporate, in Our said United Kingdom of Great Britain and Ireland, may or can act or do ; And also to have and to use a Common Seal, and the same to change and alter, from Time to Time, as they shall think fit. And We do hereby declare, and grant, that there shall be an indefinite Number of Fellows of the said Society; and that they the said *George Earl of Dartmouth, James Edward Smith, Thomas Marsham, Alexander MacLeay, Jonas Dryander, Samuel Goodenough, Aylmer Bourke Lambert, Richard Anthony Salisbury, William George Maton, Thomas Furlly Forster, Charles Hatchett, William Lewis, Thomas Rackett, John Symmons, and Thomas Young*, shall be the first Fellows of the said Society; and that any Five, or more of them, all having been first duly summoned to attend the Meetings of the said Fellows, shall and may, on or before the Twenty-fourth Day of May, next ensuing the Date of these Presents, under their respective Hands’ writing, appoint such other persons to be Fellows, Honorary Members, Foreign Members, and Associates, of the said Society, as they may respectively think fit. And We do further declare and grant, that, for the better Rule and Government of the said Society, and for the better Direction, Management, and Execution of the Business and Concerns thereof, there shall be henceforth for ever, a Council, President, Treasurer, and Secretary, of the said Society, to be elected in Manner hereinafter mentioned; and that such

Power to purchase, &c.

Land of the yearly Value of 1000*l*.

To sue and be sued.

Common Seal.

Number of Fellows indefinite.
First Fellows named.

Any Five or more of them shall, on or before the 24th of May, 1802, appoint other Members.

A Council to consist of 15 Fellows :

Council shall consist of Fifteen Members, to be elected from among the Fellows, as hereinafter directed, whereof any Five shall be a Quorum: And We do hereby nominate and appoint the said *George Earl of Dartmouth, James Edward Smith, Thomas Marsham, Alexander MacLeay, Jonas Dryander, Samuel Goodenough, Aylmer Bourke Lambert, Richard Anthony Salisbury, William George Maton, Thomas Furlly Forster, Charles Hatchett, William Lewis, Thomas Rackett, John Symmons, and Thomas Young*, to be the first Council; the said *James Edward Smith*, to be the first President; the said *Thomas Marsham*, to be the first Treasurer; and the said *Alexander MacLeay*, to be the first Secretary, to the said Society: All and each of the aforesaid Officers and Counsellors to continue in such their respective Offices until the Twenty-fourth Day of May One thousand eight hundred and three; and that the said *James Edward Smith* shall have Power to appoint such Four Persons, from and amongst the Members of the said Council, to be Vice-Presidents of the said Society, as he shall think fit, until some other Persons shall be chosen in their respective Rooms, in the Manner hereinafter mentioned. And it is Our further Will and Pleasure, that the Fellows of the said Society, or any Twenty-one or more of them, shall and may, on the Twenty-fourth Day of May, One thousand eight hundred and three, and also shall and may, on the Twenty-fourth Day of May in every succeeding Year, unless the same shall happen to be on a Sunday, and then on the Day following, assemble together at the then last, or other usual Place of meeting of the said Society, and proceed, by Method of Ballot, to put out and amove any Five of the Members who shall have composed the Council of the preceding Year; and shall and may, in like Manner, by Method of Ballot, elect Five other discreet Persons from amongst the Fellows of the said Society, to supply the Places and Offices of such Five as may have been so put out and amoved; it being Our Royal Will and Pleasure, that One-third of the Members of the said Council, and no more, shall be annually changed and removed by the Fellows of the said Society: And, also, that they, the said Fellows, or any Twenty-one or more of them, shall and may, at the Time and Place, and in Manner aforesaid, by Method of Ballot, elect, from among the Members of the said Council, when formed and elected, in Manner aforesaid, Three fit and proper Persons, one of such Persons to be President, another of such Persons to be Treasurer, and the other of such Persons to be Secretary of the said Society, for the Year ensuing; And also, in like Manner, shall and may, in case of the

5 of whom to be a Quorum. First Council named.

First President.
First Treasurer.
First Secretary.

To continue in Office till 24th of May, 1803.

The First President to appoint 4 Members of the first Council to be Vice-Presidents.

The Fellows, or any 21 or more of them, on the 24th of May, 1803, and yearly thereafter, shall, by Ballot, remove 5 Members of the Council for the preceding Year, and elect Five other Fellows in their Room;

and shall elect from amongst the Council a President, Treasurer, & Secretary for the Year ensuing.

Vacancies in the Council, &c. occasioned by Death, to be filled up within Three Months.

Fellows to appoint such other Officers as they may think fit. The President annually to appoint Four Vice-Presidents.

Power of electing and removing Members, after the 24th of May next, vested in the Fellows, or any 11 or more of them.

The Council, or any 5 or more of them, all having been summoned, empowered to make Bye-Laws,

Death of any of the Members of the Council, or of the President, Treasurer, or Secretary, for the Time being, within the Space of Three Months next after such Death or Deaths, in like Manner, elect other discreet Persons, being Fellows of the said Society, to supply the Places and Offices of such Members of the said Council, or of the President, Treasurer, or Secretary, so dying: And also shall and may appoint such other Persons to be Officers of the said Society for the year ensuing, as they may think proper and necessary, for the transacting and managing the Business thereof. And it is Our further Will and Pleasure, that, so soon after the Elections aforesaid as conveniently may be, the Person who shall at any time hereafter be elected to be President of the said Society, in Manner aforesaid, may and shall nominate and appoint four Persons, being Members of the said Council, to be Vice-Presidents of the said Society for the Year ensuing. And We do further declare and grant, that, from and after the said Twenty-fourth day of May, now next ensuing, the Fellows of the said Society, or any Eleven or more of them, shall and may have Power, from Time to Time, at the General Meetings of the said Society, to be held at the usual Place of Meeting of the said Society, or at such other Place as shall have been in that Behalf appointed, by and with the consent of the said Society as hereinafter mentioned, to elect such Persons to be Fellows, Honorary Members, Foreign Members, and Associates of the said Society, and all Fellows, Honorary Members, Foreign Members, and Associates, to remove from the said Society, as they shall think fit: And that the Council hereby appointed, and the Council of the said Society for the Time being, or any Five or more of them, all the Members thereof having been first duly summoned to attend the Meetings thereof, shall and may have Power, according to the best of their Judgment and Discretion, to make and establish such Bye-Laws as they shall deem useful and necessary for the Regulation of the said Society, and of the Estate, Goods, and Business thereof; and for fixing and determining the Times and Places of meeting of the said Society, and also the Times, Place, and Manner of electing, appointing, and removing all Fellows, Honorary Members, Foreign Members, and Associates, of the said Society, and all such subordinate Officers, Attendants, and Servants, as shall be deemed necessary or useful for the said Society; And also for filling up, from Time to Time, any Vacancies which may happen by Death, Removal, or otherwise, in any of the Offices or Appointments constituted or established for the Execution of the Business and Concerns of the said Society; and for regulating and

ascertaining the Qualifications of Persons to become Fellows, Honorary Members, Foreign Members, and Associates, of the said Society respectively, and also the Sum and Sums of Money to be paid by them respectively, whether upon Admission or otherwise, towards carrying on the Purposes of the said Society; And such Bye-Laws, from Time to Time, to vary, alter, or revoke, and make such new and other Bye-Laws as they shall think most useful and expedient, so that the same be not repugnant to these Presents, or to the Laws of this Our Realm: Provided that no Bye-Law hereafter to be made, or Alteration or Repeal of any Bye-Law which shall hereafter have been established by the said Council hereby appointed, or by the Council for the time being of the said Society, shall be considered to have passed, and be binding on the said Society, until such Bye-Law, or such Alteration or Repeal of any Bye-Law, shall have been hung up in the common Meeting-Room of the said Society, and been read by the President, or by any one of the Vice-Presidents for the time being, at Two successive General Meetings of the said Society, and until the same shall have been confirmed by Ballot, by the Fellows at large of the said Society; such Ballot to take place at the ensuing Meeting next after such two successive General Meetings of the said Society, Eleven, at least, of the Fellows of the said Society being present; and provided that no such Bye-Law, or Alteration or Repeal of any Bye-Law, shall be deemed or taken to pass in the affirmative, unless it shall appear, upon such Ballot, that Two-thirds of the Fellows present at such Meeting shall have voted for the same. WITNESS His Majesty at Westminster, the Twenty-sixth Day of March, in the Year of our Lord One thousand eight hundred and two.

and to alter such Bye-Laws;

but no Bye-Law, or Alteration, shall be binding on the Society until it shall have been confirmed by Ballot at a General Meeting, 11 Fellows at least being present.

WILMOT.

BYE-LAWS

OF THE

LINNEAN SOCIETY OF LONDON,

AS CONFIRMED AT A GENERAL MEETING OF THE SOCIETY HELD
ON THE 6TH OF JULY 1802; WITH ALTERATIONS AND ADDI-
TIONS SUBSEQUENTLY MADE.

CHAPTER I.

Of the Election and Admission of Fellows.

SECTION I. **E**VERY Fellow who intends to propose any Person to be a Fellow of the Society, shall, before such Person be proposed, make known to him the nature of the Obligation into which he is to enter, in the event of his being elected; and also the Sum which is to be paid for Admission-Money, the rate of Annual Payments, and the Sum to be paid in lieu of Annual Payments, for the Use of the Society.

II. Every Candidate for Admission as a Fellow shall be proposed and recommended by Three or more Fellows, who shall, at a General Meeting of the Society, cause to be delivered to the Secretary a Paper, signed by themselves, specifying the Christian Name, Surname, Rank, Profession, Qualifications, and the usual Place of Residence of such Person; all which shall be certified from their personal Acquaintance with him, or their Knowledge of his Character or Writings.

III. No Person shall be proposed as a Fellow, or be capable of being elected as such, until he shall have fully attained the Age of Twenty-one Years.

IV. Each Recommendation of a Candidate for Admission as a

Fellow shall be hung up in the common Meeting-Room of the Society, the Date of the Day on which it shall be presented being previously written on it, and shall be read at Three successive General Meetings, between the Meeting at which the same shall be presented and the Meeting at which the Ballot for Election shall take place.

V. No Person shall be declared to be elected a Fellow, unless he have in his Favour Two-thirds of the Number balloting.

VI. Every Person chosen a Fellow shall have immediate Notice of his Election given to him by the Secretary, and shall appear personally for his Admission within the Space of Two Months from the Day of his Election, or within such further Time as shall be granted by the Council, upon special Application being made to them for that Purpose.

VII. No Person elected shall be admitted a Fellow of the Society, until he shall have paid his Admission-Fee, and signed the usual Obligation for the Payment of Yearly Contributions, or paid the Sum appointed in lieu of such Contributions.

VIII. Every Person elected a Fellow of the Society shall, before his Admission, subscribe an Obligation in the following Words, viz. “ We who have hereunto subscribed, do hereby promise, each for
“ himself, that we will endeavour to promote the Good of *The*
“ *Linnean Society of London*, and to pursue the Ends for which the
“ same was instituted: That we will be present at the Meetings
“ of the Society, as often as conveniently we can, especially at the
“ Anniversary Elections, and upon extraordinary Occasions; and
“ that we will observe the Statutes, Bye-Laws, and Orders of the
“ said Society. Provided that, whensoever any of us shall signify
“ to the President, under his Hand, that he desires to withdraw
“ from the Society, he shall be free from this Obligation for the
“ future.” And if any Person should refuse to subscribe the said
Obligation, the Election of that Person shall be void.

IX. The Admission of every Fellow shall be at some Meeting of the Society in Manner and Form following, viz. The President, taking him by the Hand, shall say, “ A.B. By the Authority and
“ in the Name of the Linnean Society of London, I admit you a
“ Fellow thereof.”

X. No Person shall be deemed an actual Fellow of the Society, nor shall the Name of any Person be printed in the Annual List of the Fellows of the Society, until such Person shall have paid his Admission-Fee, and signed the usual Obligation for the Payment of Annual Contributions, or paid the Sum appointed in lieu of

such Contributions; and no such Person shall have Liberty to vote at any Election or Meeting of the Society, before he shall have been admitted as directed in the preceding Section.

CHAPTER II.

Of the Payments to be made by the Fellows.

SECT. I. All Fellows elected before the Twenty-fourth Day of May 1829, who have already paid their Admission-Fees, but have not paid Twenty Guineas in lieu of all Annual Payments, shall pay to the Use of the Society the Annual Contribution of Two Guineas. Provided, however, that every such Fellow may at any time compound for all future Annual Payments by paying the said Composition of Twenty Guineas, including the Annual Contribution which may be due at the Time such Composition shall be paid.

II. All Fellows who shall be elected after the Twenty-fourth Day of May 1829, shall, before they be admitted, pay to the Use of the Society the Sum of Six Pounds for their Admission-Fee; and if any Person refuse, or fail to pay the said Sum, his Election shall be void, unless the same be remitted, in whole or in part, by special Order of the Council.

III. Every Fellow who shall be elected after the Twenty-fourth Day of May 1829, shall, besides the Admission-Fee, further contribute towards the Funds of the Society, previous to his Admission, by paying the Sum of Thirty Pounds in lieu of all future Payments; or he shall sign an Obligation for the regular Payment of Three Pounds per Annum to the Society, so long as he shall continue a Fellow.

IV. Every such Fellow so elected may at any time compound for his future Contributions by paying the Sum of Thirty Pounds in One Year instead of the Annual Contribution for that Year; in which Case his Obligation to make Annual Payments shall be void. Provided, nevertheless, that in case any Fellow be not usually resident within the United Kingdom of Great Britain and Ireland, such Person shall within Six Months after his Election, or such other Time as the Council shall permit, and before he be admitted, pay, or cause to be paid into the hands of the Treasurer, the Sum of Thirty Pounds in lieu of Annual Contributions, or provide such Security for the Payment of the Annual Contributions as shall be satisfactory to the Council.

V. All Yearly Contributions shall be considered due and pay-

able at each Anniversary Meeting, for the Year preceding ; but no Fellow elected on or after the First Day of February in any Year, shall pay the Annual Contribution falling due at the Anniversary Meeting of that Year.

VI. If any Fellow paying Yearly Contributions should fail to bring, or send in the same to the Treasurer, within Twelve Months after each Anniversary Meeting, unless the said Payment be remitted in whole or in part by special Order of the Council, his Obligation shall be put in Suit for the Recovery thereof, and he shall be liable to Ejection from the Society ; upon which the Council shall proceed as they may see Cause.

CHAPTER III.

Of the Honorary Members.

SECT. I. The Number of Honorary Members shall not exceed Four, besides such Members of the Royal Family as may express a wish to belong to the Society.

II. When a Vacancy shall occur in the Number of Honorary Members, the Fellows shall, at the then next, or any succeeding Anniversary Meeting, as they shall think fit, elect, by open Vote, a distinguished Personage to fill such Vacancy ; provided that no such Personage shall be considered as elected unless Two-thirds of the Number of Fellows present shall have voted for him.

III. As soon as may be after the Election of any Honorary Member, the President shall announce such Election to him by Letter, and at the same time transmit to him a printed Copy of the Statutes and Bye-Laws of the Society, with a List of the Members.

CHAPTER IV.

Of the Foreign Members.

SECT. I. The Number of Foreign Members shall not exceed Fifty ; and no Person shall be proposed as a Foreign Member until a Vacancy shall have been actually declared to the Society.

II. Each Certificate proposing a Candidate for Election as a Foreign Member shall be signed by Six or more Fellows, and shall specify his Christian Name, Surname, Titles, Works, Quality or Profession, and his Place of Residence. Such Certificate shall be presented at one of the General Meetings of the Society, on or before the Seventh Day of February in every Year ; and, after

being read, shall be fixed up in the public Meeting-Room, where it shall continue until the Election, which shall take place at the Meeting immediately preceding the Anniversary. Each Certificate is also to be read at every Meeting of the Society which may intervene between the Time of its being presented and the Day of Election.

III. At the General Meeting immediately preceding the Anniversary, the President, or Vice-President in the Chair, shall declare the Number of Vacancies, and the Number of Candidates proposed as aforesaid, who shall then be severally balloted for, in alphabetical Order; and those Candidates who shall have the greatest Number of Votes shall be declared as elected: Provided, however, that no Person shall be considered as duly elected, unless he have in his Favour Two-thirds of the Number voting.

IV. In case of an Equality of Votes in Favour of Two or more Candidates, whose Number shall exceed the Number of Vacancies to be filled up from them, the Excess of such Number shall be excluded by Lots, to be drawn by the President, or Vice-President in the Chair; and the Person or Persons whose Names shall remain undrawn shall be declared to be duly elected.

V. There shall be transmitted to each Foreign Member, as soon as may be after his Election, a Diploma in the Latin Language, under the Common Seal of the Society, signed by the President or one of the Vice-Presidents, and countersigned by the Secretary.

VI. No British Subject, nor any Person usually residing in any of the British Dominions, unless he be an Ambassador from a Foreign Court, shall be elected a Foreign Member of the Society.

CHAPTER V.

Of the Associates.

SECT. I. Not more than one Person in each Year shall be elected an Associate, until the total Number shall not exceed Twenty-five, to which Number the Associates shall thenceforward be limited.

II. The Associates shall include only such Persons as usually reside in the British Dominions.

III. Every Candidate for Election as an Associate shall be proposed, recommended, and balloted for in like Manner, in all Respects, as is directed in the Second, Third, and Fourth Sections of Chapter I. respecting the Election of Fellows.

IV. The Secretary shall, immediately after the Election of any

Person as an Associate, announce the same, by Letter, to the Person who may be so elected, and shall transmit to him a printed Copy of the Statutes and Bye-Laws of the Society, with the List of the Members.

CHAPTER VI.

Of the Death or Withdrawing of Members.

SECT. I. Upon the Death or the voluntary Withdrawing of any Fellow, Honorary Member, Foreign Member, or Associate, the Secretary shall note such Death or Withdrawing in the printed List of that Year; and the Death or Withdrawing of any Member shall be entered upon the Minutes of the Society at the then next Anniversary Meeting.

II. No Fellow shall be understood to have withdrawn himself from the Society until he shall have paid all Arrears that may be due, and signified such his Intention by Letter, under his Hand, addressed to the President; and if such Letter be not left at the Apartments of the Society, between the Twenty-fourth Day of May in any Year and the First Day of February next following, the Contribution of such Fellow shall be understood to be continued for the Whole of the Year in which he shall have so withdrawn himself.

CHAPTER VII.

Of the Causes and Form of Ejection.

SECT. I. If any Member of the Society should, contemptuously, or contumaciously, disobey the Statutes or Orders of the Society or Council; or should, by speaking, writing, or printing, publicly defame the Society; or advisedly, maliciously, or dishonestly, do any Thing to the Damage, Detriment, or Dishonour thereof, he shall be liable to Ejection from the Society.

II. Whensoever there shall be Cause for the Ejection of any Member from the Society, the President shall, at some Meeting thereof, propose the Ejection of such Member; and at the next General Meeting the Question shall be put to the Ballot, and if Two-thirds of the Members present vote for it, the President shall cancel the Name of such Person in the Register, and at the same Time pronounce him ejected in these Words, viz. "By the Authority and in the Name of the Linnean Society of London, I declare A. B. to be now ejected and no longer a (Fellow, &c.

“as the Case may be) thereof.” And the Ejection of every such Person shall be then recorded in the Minute-Book of the Society; and his Name, as ejected, shall be read at the next Anniversary Meeting.

III. All Persons ejected from the Society shall be thereby rendered incapable of belonging to it in future.

CHAPTER VIII.

Of the Election of the Council and Officers.

SECT. I. Every Fellow of the Society residing within the United Kingdom, and whose Residence may be known to the Secretary or Librarian, shall be summoned to the Anniversary Meetings for electing the Council and Officers for the Year ensuing, by a Letter signed by one of the Secretaries; and such Summons shall be sent by Post, to the House or Lodging of every such Fellow, a Week at the least before the Election, which by the Charter is directed to take place annually on the Twenty-fourth Day of May, being the Birth-Day of the celebrated Linnæus; unless that Day shall happen to be on a Sunday, and then on the Day following. And each Anniversary Meeting shall also be advertised in Two or more of the public Newspapers, at least One Week before the same take place.

II. The Council for the Time being shall, before the Day of Election, cause to be prepared a sufficient Number of printed Balloting-Lists, according to the annexed Forms; One of which (No. I.) is to contain the Names of such Persons as they shall recommend to be removed from and elected into the Council, and the other (No. II.) to contain the Names of such Persons as they shall recommend to fill the Offices of President, Treasurer, and Secretaries, for the ensuing Year.

III. On the Day of Election, the President, or in his absence a Vice-President, shall take the Chair precisely at Three o'Clock P.M., and shall immediately open the Business of the Day; Two Balloting-Glasses being placed before the Chair. One of those Glasses shall remain open for receiving Lists for the Council until Four o'Clock, and the other Glass shall remain open for receiving Lists for the Officers until Half-past Four o'Clock P.M., at which respective Times the Ballots shall be closed.

IV. Balloting-Lists shall be delivered to every Fellow who shall apply for them; and if any Fellow should not approve of the Persons therein named, but be desirous of giving his Vote for some other Person or Persons, he will strike his Pen across the

printed Name or Names of the Person or Persons of whom he may disapprove, and will write over against such printed Name or Names on the blank Side left and prepared for that Purpose, the Name or Names of the other Person or Persons for whom he may be desirous to give his Vote.

V. Each Fellow voting shall deliver his Balloting-List or Lists, folded up, to the President or Vice-President in the Chair, who shall, in his presence, immediately put such List or Lists into the respective Glasses; and the Name of each Fellow who shall so deliver in his List or Lists shall be marked on a printed List of the Fellows, by one of the Secretaries, or by the Person officiating in his stead.

VI. When the Ballot for the Council shall have been closed, the President or Vice-President in the Chair shall appoint Three Scrutineers, not Members of the Council, to examine the Lists, and report the Result of the Ballot: One of those Scrutineers shall open and read aloud each List deposited in the Balloting-Glass, and file it, while the other Two Scrutineers shall mark the Names; and when all the Lists shall be drawn and read, the Scrutineers shall cast up the Number of the Votes for each Person, whether to be removed from or elected into the Council, and shall report the same to the President or Vice-President in the Chair, who shall then declare the Five Persons for whose Removal from the Council there shall be the Majority of Votes, to be removed accordingly; and the Five Persons for whose Election there shall be a Majority of Votes, to be elected Members of the Council for the ensuing Year accordingly.

VII. When the Members of the Council for the ensuing Year shall have been declared, and not before, the President or Vice-President in the Chair shall appoint the same or Three other Scrutineers, not being Members of the Council, to examine the Lists and report the Result of the Ballot for President, Treasurer, and Secretaries; and such Examination and Report being made agreeably to the Directions contained in the preceding Section respecting the Council, the President or Vice-President in the Chair shall declare those who have the Majority of Votes to be the Persons elected to the respective Offices.

VIII. If any List should contain more than the proper Number of Names, or if any List for Officers should include the Name of any Person not being a Member of the Council, such List shall be set aside, and not taken any account of, by the Scrutineers in casting up the Number of Votes.

IX. In case of an Equality of Votes for the Removal from the

Council, or for the Election of Two or more Persons, whose Number together shall exceed the Number to be removed or elected exclusive of those having a Majority of Votes, the Excess of such Number shall be secluded by Lots, to be prepared by the Scrutineers and drawn by the President or Vice-President in the Chair; and the Person or Persons whose Name or Names shall remain undrawn shall be declared to be removed from or elected into the Council, or elected to any of the Offices, as the Case may be.

X. If Twenty-one Fellows at least do not appear and give in their Balloting-Lists during the Time limited for keeping the Ballot for the Council open, or if any Question should arise in the course of an Election, respecting the Forms thereof, and cannot be decided by the Fellows present, the Election shall be adjourned to the next convenient Day, of which Notice by Letter shall be given to all the Fellows of the Society, in the same Manner as is directed in the First Section of this Chapter.

XI. In case of a Vacancy in the Council, or among the Officers of the Society, happening during the Intervals of the Anniversary Elections, the Council shall appoint a Special General Meeting, for the Purpose of filling up such Vacancy; and the Summons for such Meeting, and the Proceedings at it, shall, as far as Circumstances will admit, be after the same Manner as is directed for the Anniversary Elections.

CHAPTER IX.

Of the President.

SECT. I. The Business of the President shall be to preside in all the Meetings, and regulate all the Debates of the Society, Council, and Committees; to state and put Questions, which shall have been moved and seconded, both in the Affirmative and Negative, according to the Sense and Intention of the Meetings; to call for Reports and Accounts from Committees and others; to check Irregularities, and to keep all Persons in the Meetings to Order; to cause all Extraordinary Meetings of the Council and Committees to be summoned when necessary; and, generally, to execute, or see to the Execution of, the Statutes and Bye-Laws of the Society.

CHAPTER X.

Of the Treasurer and his Accounts.

SECT. I. The Treasurer, or some Person appointed by him, shall

receive for the Use of the Society all Sums of Money due or payable to the Society ; and out of such Money shall pay and disburse all Sums of Money which may be due from or payable by the Society ; and shall keep particular Accounts of all such Receipts and Payments.

II. Every Sum of Money payable on account of the Society, amounting to Five Pounds or upwards, shall be paid by Order of the Council, signed by the President or Vice-President in the Chair, and registered by the Secretary.

III. All Sums of Money in the Hands of the Treasurer, which there shall not be present Occasion for expending or otherwise disposing of for the Use of the Society, shall be laid out in such Government or other Securities as shall be approved of and directed by the Council.

IV. The Treasurer shall keep a Yearly List of all such Fellows of the Society as shall have paid the Sum appointed in lieu of Annual Contributions ; and also of those who pay the Annual Contributions ; and in this List shall be noted the Times up to which the Annual Contributions shall have been paid, and the Arrears due from each Fellow respectively.

V. The Treasurer shall also keep a Book of printed Check-Receipts for Annual Contributions ; each Receipt to be signed by himself, and to be filled up with the Name of the Fellow paying, the Sum paid, and the Time paid to : these Receipts to be under-signed by the Person who shall receive the Money on the Treasurer's behalf, who, upon the Delivery of the Receipt to the Fellow paying, is to enter upon that Part of the Check which shall be left in the Book the above Particulars, and also the Day of Payment.

VI. The Treasurer shall demand the Annual Contributions, or cause them to be demanded, of such Persons as shall neglect to make their Payments for Six Months after they become due.

VII. The Accounts of the Treasurer shall be audited annually, a short Time preceding the Anniversary Meeting, by a Committee consisting of the President and One of the Secretaries, and of Four Fellows of the Society, of whom Two shall be Members of the Council, and the other Two not Members thereof ; such Four Auditors to be elected at One of the Two next preceding General Meetings of the Society, upon the Nomination of the President ; the Election to be determined by a Show of Hands ; any Three of the Auditors to be a Quorum. The Report of the said Auditors shall be laid before the Society upon the Day of the Anniversary

Meeting, stating not only the Balance in the Treasurer's Hands, but also the general State of the Funds of the Society.

VIII. The Treasurer shall take care that all Writings relating to the Society's Funds and Property, the Obligations given by the Fellows, the Policies of Insurance, and other Securities, be lodged in the Society's Iron Chest, and be inspected by the Council once in every Year.

IX. The Society shall not, and may not, make any Dividend, Gift, Division, or Bonus in Money, unto or between any of its Members.

CHAPTER XI.

Of the Secretaries.

SECT. I. There shall be Two Secretaries, and, so far as may be practicable, the Duties of one of them shall be devoted to the Zoological, and of the other to the Botanical Proceedings of the Society.

II. The Secretaries, or either of them, shall have Inspection over the Librarian, and other Salaried Officers and Servants of the Society. They shall, subject to the Direction of the Council, have the general Management of the Business of the Society, and conduct its Correspondence.

III. The Editing and Printing of the Society's Transactions shall be entrusted to the Secretaries respectively; each taking charge of the Papers belonging to his own Department.

CHAPTER XII.

Of the Librarian and other Salaried Officers.

SECT. I. The Person who shall be chosen to the Office of Librarian, or to any other Office to which Salaries or Emoluments are to be annexed, shall either not be a Fellow of the Society; or, if a Fellow, shall cease to be so, upon his Election to, and Acceptance of, any such Office.

II. The Librarian shall be competently skilled in Languages and Natural Knowledge, and able to write a fair and legible Hand.

III. The Election of the Librarian shall be by the Fellows, in the following Manner: viz. The Names of the several Candidates, if more than one, shall be printed, and delivered to every Fellow

attending the Election; each of whom shall take off the Name of such Candidate as he may desire to vote for, and (after having had his own Name marked in a List of the Fellows of the Society by the Secretary, assisted by two Scrutators, to be appointed in the same manner as at the Anniversary Elections) shall deliver the Name of the Candidate so taken off, and folded up, into the Hands of the President, who, in the Presence of the Society, shall put the several Names into a Balloting-glass; and the Candidate who shall be found to have the Majority of Votes shall be deemed duly elected.

IV. The Librarian shall receive such Salary and Allowances as the Council may judge reasonable; and shall not, under Pain of Dismissal, receive any Perquisite, or Profit whatever, arising from his Connection with the Society, excepting that which shall be expressly allowed by the Council, and shall be subject to such Rules and Orders as shall, from Time to Time, be given to him by the President and Council.

V. The Librarian shall have, under the Authority of the Council, the Charge of the Society's Library and Museum. He shall attend on such Days, and at such Hours, as the Council shall direct, for the Accommodation of such Fellows, or other Members of the Society, as may be desirous of consulting them.

VI. Any Fellow of the Society shall be allowed the Loan of Books from the Library, under such Regulations, and with such Exceptions and Restrictions, as the Council shall, from Time to Time, determine. The Librarian shall not, without leave of the Council, permit any Article whatever to be taken out of the Library.

VII. The Council shall, from Time to Time, appoint such Clerk or other Salaried Officers as they may deem necessary for the Transaction of the Business of the Society.

CHAPTER XIII.

Of the General or Ordinary Meetings of the Society.

SECT. I. The General or Ordinary Meetings of the Society shall be held on the Third Thursday in January, the First and Third Thursdays in February, March, and April, the First Thursday in May, and on the First and Third Thursdays in June, November, and December, to begin at Eight o'Clock in the Evening, and to continue about an Hour, at the Discretion of the President; but there shall be no Meetings of the Society in the Months of

July, August, September, and October, nor on the First Thursday in the Month of January.

II. The Honorary Members, Foreign Members, and Associates shall have free Communication with the Society at their General Meetings.

III. Each Fellow, Honorary Member, Foreign Member, and Associate, may introduce a Stranger at every General Meeting of the Society, on delivering his Name to the President; and the Name of every Stranger so introduced shall be entered in the Minute-Book, together with the Name of the Member who shall introduce him, and who is to be accountable for his Conduct during his Presence at the Meeting.

IV. In case of the Absence of the President, a Vice-President shall preside at every General Meeting; and if neither the President, nor any one of the Vice-Presidents, be present, then the Chair shall be taken by some Member of the Council who may be present.

V. When the Chair shall have been taken, the Minutes of the preceding Meeting shall be immediately read, and be signed by the Chairman of the Meeting, and the Presents on the Table shall be declared.

VI. The Business of the Society in their General Meetings shall be, to read and hear Letters, Reports, and other Papers, on Subjects of Natural History; and also to view such Specimens of the Productions of Nature as shall be presented.

VII. Whenever, at a General Meeting, the Votes, for and against a Question proposed, shall be found to be equal, in case the Question do not relate to an Election, or other Matter particularly provided for in this respect by the Charter or Bye-Laws, the President, Vice-President, or Member of the Council in the Chair, shall have a double Vote.

CHAPTER XIV.

Of the Meetings of the Council.

SECT. I. The Council shall meet at such Times as shall be appointed by the President, or, in his Absence, by one of the Vice-Presidents; due and sufficient Notice of each Meeting being previously sent to every Member of the Council.

II. The President, or one of the Vice-Presidents, shall preside at every Meeting of the Council.

III. When the Chair shall have been taken, the Minutes of the

preceding Meeting of Council shall be read, and, if approved by the Members present, shall be signed, in the fair Minute-Book, by the President or Vice-President in the Chair.

IV. When any Question shall be agitated at a Meeting of the Council, it shall be determined by open Vote, unless Two or more Members of the Meeting demand a Ballot; and if there should be an Equality of Votes in either Case, the President, or Vice-President in the Chair, shall have a double Vote. It is however declared, that all Questions relative to Elections, or to the making or repealing of Bye-Laws, shall be determined by Ballot.

V. When a Question shall have been determined upon in Council, which, agreeably to the Charter, must necessarily be approved of by the Fellows at large, the Resolution of the Council upon such Question, signed by the President, or Vice-President who may have presided at the Time, and by the Secretary, shall be read from the Chair, at the next General Meeting of the Society.

VI. The Papers read at the Meetings of the Society shall be referred to the Council, who shall determine respecting their Publication; and the Council shall have power to refer them to be reported upon, to any competent Person, although he may not be a Member of the Council. All Questions relating to the Publication of Papers shall be decided in Council by Ballot, if any Member present shall so require.

CHAPTER XV.

Of the Manner of Publication of the Papers laid before the Society.

SECT. I. The Transactions and other Publications of the Society shall be printed at such Times, and in such Manner, as the Council for the Time being shall direct.

II. Every Fellow, whose Payments to the Society shall have been paid up to the Time of Publication of each Part of the Society's Transactions, or other Publications, shall be entitled to One Copy of such Part; but no Fellow who shall not have paid the Sum appointed in lieu of all Annual Payments, or paid at least One Yearly Contribution at the Time of Publication, shall be considered as entitled thereto.

III. No Fellow of the Society shall be entitled to receive, gratis, any Copy or Copies of the Transactions, or other Publications, after Five Years shall have elapsed from the Time of their Publication, unless the Council shall otherwise direct.

CHAPTER XVI.

Of the Books and Papers of the Society.

SECT. I. There shall be kept a Book, called the Charter and Bye-Law Book, in which shall be fairly written the Copy of the Charter and Bye-Laws, and also the Obligation to be subscribed by the Fellows of the Society in their own Handwriting.

II. There shall be kept a Book, containing the Register of the Fellows of the Society, with the Times of their Election and Admission.

III. There shall be kept Minute-Books for the Society and Council; in which shall be entered all the Minutes, Orders, and Business of the Society and Council at their respective Meetings.

IV. Any Fellow of the Society may, at proper Times, and in the Society's Apartments, have the Liberty of inspecting the Minute- or other Books of the Society; but no Fellow shall take any Copy or Transcript of any matter contained therein, without leave obtained of the Council.

V. The original Copy of every Paper, after having been read before the Society, shall be considered as the Property of the Society, if there should be no previous Engagement with its Author to the contrary.

CHAPTER XVII.

Of the Common Seal and Deeds.

SECT. I. The Common Seal of the Society shall be kept in an Iron Chest, having Three Locks, with Three different Keys; of which One shall be in the Custody of the President, another of the Treasurer, and the Third of the Senior Secretary.

II. Every Deed, or Writing, to which the Common Seal is to be affixed, shall be passed, and sealed in Council, and signed by the President, or Vice-President in the Chair, and by the rest of the Members of the Council present.

APPENDIX.

No. I.

Form of a Balloting-List for the Council.

A LIST of the Persons recommended by the Council of the Linnean Society of London to be removed from, and elected into the said Council, at the Election of May 18 .

Five Members of the present Council recommended to be removed.

A. B.	
C. D.	
E. F.	
G. H.	
I. K.	

Five Fellows recommended to be elected into the Council.

L. M.	
N. O.	
P. Q.	
R. S.	
T. U.	

Any Fellow who disapproves of any of the Names recommended above, is requested to strike out with his Pen such Names as he does not approve, and to write opposite to each Name so struck out, the Name of the Person for whom he chooses to give his Vote.

No. II.

Form of a Balloting-List for the Officers.

A LIST of the Persons recommended by the Council of the Linnean Society of London to be appointed to the Offices of President, Treasurer, and Secretaries of the Society, at the Election of May 18 .

PRESIDENT B. A.	PRESIDENT
TREASURER D. C.	TREASURER
SECRETARIES F. E. G. H.	SECRETARIES

Any Fellow who disapproves of any of the Names recommended above, is requested to strike out with his Pen such Names as he does not approve, and to write opposite to each Name so struck out, the Name of the Person for whom he chooses to give his Vote.

PROCEEDINGS
OF THE
LINNEAN SOCIETY OF LONDON.

November 1st, 1860.

Thomas Bell, Esq., President, in the Chair.

Mr. Joshua Clarke, F.L.S., exhibited specimens of a new British plant (*Lathyrus tuberosus*) found last autumn at Fyfield, near Ongar, Essex; and read a short notice of it. (See "Botanical Proceedings," vol. v.)

Read, "Introduction to the Florula of Aden;" by Thomas Anderson, Esq., F.L.S. (See "Botanical Proceedings," Supplement to vol. v.)

November 15th, 1860.

Thomas Bell, Esq., President, in the Chair.

Read, first, "Catalogue of Dipterous Insects collected by A. R. Wallace, Esq., in Batchian, Kaisaa, and Makian, and at Tidon in Celebes; with descriptions of new Species," by Francis Walker, Esq., F.L.S. (See "Zoological Proceedings," vol. v.)

Read, secondly, "Catalogue of the Dipterous Insects collected by Mr. Wallace at Manado in Celebes, and in Tond, with descrip-

tions of new Species"; by the same. (See "Zoological Proceedings," vol. v.)

Read, thirdly, "Note on the Fructification and Affinities of *Hydnum gelatinosum*, Fr.," by Frederick Currey, Esq., M.A., F.R.S. & L.S. (See "Botanical Proceedings," vol. v.)

Read, fourthly, "Extracts of a Letter from Miss Drew to Mr. Robert Paterson, of Belfast, On the Habits of Singing Mice." Communicated by the President.

December 6th, 1860.

Thomas Bell, Esq., President, in the Chair.

William S. Atkinson, Esq.; Frederic John Farre, Esq., M.D.; Maxwell T. Masters, Esq.; and Walter Moxon, Esq., M.B., were elected Fellows.

Sir Charles Bunbury, Bart., F.L.S., exhibited a specimen of *Cinclidium stygium*, a rare moss, new to the county of Suffolk. In a note, dated Nov. 19th, 1860, which accompanied the specimen, Sir Charles states that it was discovered, at the beginning of the month by Mr. Edmund Skeppar, of Bury St. Edmunds, on Tuddenham Heath, near Mildenhall, long since noted as the locality of several rare plants, and especially of *Liparis Læselii*.

Read, first, "Notes on *Sphærulearia Bombi*;" by John Lubbock, Esq., F.R.S., F.L.S.

Read, secondly, "The Natural Order *Aurantiaceæ*, with a Synopsis of the Indian Species;" by Daniel Oliver, Esq., F.L.S., Prof. Bot. Univ. Coll., Lond. (See "Botanical Proceedings," 2nd Supplement to vol. v.)

December 20th, 1860.

George Bentham, Esq., V.P., in the Chair.

Thomas Walker, Esq., B.A., was elected a Fellow.

Mr. Bentham, V.P.L.S., exhibited specimens of a species of *Cavanillesia*, probably *C. platanifolia*, Humb. and Bonpl., brought from the neighbourhood of New Carthagená by M. Anthoine, and stated by him to have been obtained from a young tree felled by him, which measured 140 feet in height, without branches, except the parasol-like crown. The specimens consisted of flowers, fruit, a piece of the soft, pith-like wood, and of the liber, which closely resembles the Cuba Bass, but is of a somewhat coarser fibre.

Read, first, a Letter from C. C. Babington, Esq., F.R.S., F.L.S., announcing the discovery by Mr. G. Wolsey of *Isoëtes Hystrix*, Durieu, on L'Ancrese Common, in the Island of Guernsey. (See "Botanical Proceedings," vol. v.)

Read, secondly, an Extract of a Letter from Mr. Henry Mouhot to S. Stevens, Esq., F.L.S., dated Bangkok, Siam, 7th April, 1860, and giving a description of the "Cambodian Mode of Engrafting."

Read, thirdly, Extract of a Letter from Dr. W. F. Daniell, F.L.S., to Mr. Kippist, dated Tien Tsin, Oct. 10th, 1860, and giving some account of the cultivated fruits and *Cerealia* of Northern China.

Read, fourthly, "Further Observations on *Entozoa*, with Experiments," by T. S. Cobbold, Esq., M.D., F.L.S. (See "Transactions," vol. xxiii. part 2.)

Read, fifthly, "On *Sclerostoma Syngamus*, and the Disease which it occasions in Birds;" by the same. (See "Zoological Proceedings," vol. v.)

Read, sixthly, "Notice of the Discovery of a Second Species of *Gyrodactylus* (*G. anchoratus*, Nordm.), parasitical upon certain Fish;" by C. L. Bradley, Esq., F.L.S. (See "Zoological Proceedings," vol. v.)

January 17th, 1861.

Thomas Bell, Esq., President, in the Chair.

Christopher Dresser, Esq., Ph. D. ; Robert Charles Hurst, Esq. ; and John Millar, Esq., were elected Fellows.

Read, first, "On Proliferation in Flowers, and especially on that form termed Median Proliferation;" by Maxwell T. Masters, Esq., F.L.S. (See "Transactions," vol. xxiii. part 2.)

Read, secondly, Extract from a Letter, addressed to Sir W. J. Hooker, by Dr. Frederick Welwitsch, dated S. Paul de Loanda, Aug. 16th, 1860; and giving some account of the Botany of Benguela, Mossamedes, &c., in Western Africa. (See "Botanical Proceedings," vol. v.)

Certain alterations in the Bye-laws, agreed to by the Council, were read by the President, and ordered to be hung up in the Meeting-room.

February 7th, 1861.

Thomas Bell, Esq., President, in the Chair.

William Carruthers, Esq., was elected a Fellow.

Dr. J. D. Hooker, F.R.S., F.L.S., exhibited a specimen of a new species of *Araucaria* (*A. Rulei*, Ferd. Müll.) from a volcanic islet off New Caledonia.

Read, a paper "On the Occurrence of *Festuca ambigua*, Le Gall, in the Isle of Wight;" by Alexander G. More, Esq., F.L.S. (See "Botanical Proceedings," vol. v.)

February 21st, 1861.

Thomas Bell, Esq., President, in the Chair.

Arthur William Crichton, Esq.; Henry Tattershall Knowles Kempton, Esq.; Capt. Augustus Frederick Lendy; David Moore, Esq.; and Christopher Knox Ord, Esq., M.D., were elected Fellows; and Mr. William Laughrin was elected an Associate.

Read, first, Extracts from Letters addressed to Sir William and Dr. Hooker by Mr. Gustav Mann, giving an account of his second Ascent of Clarence Peak, Fernando Po. (See "Botanical Proceedings," vol. vi.)

Read, secondly, "A Glance at the Botany of the North Shore, Sydney;" by William Woolls, Esq. Communicated by the Librarian.

Read, thirdly, "Catalogue of the Dipterous Insects collected by Mr. A. R. Wallace at Gilolo, Ternate, and Ceram;" by Francis Walker, Esq., F.L.S. (See "Zoological Proceedings," vol. vi.)

Read, fourthly, "Description of a (supposed) new Annelid;" by E. Hart Vinen, Esq., M.D., F.L.S. (See "Zoological Proceedings," vol. vi.)

The alterations in the Bye-laws, proposed by the Council on the 17th of January, having been hung up in the Common Meeting-room of the Society, and read by the President at the two last successive General Meetings of the Society, were put to the Ballot, and confirmed by the Fellows at large in the terms of the Charter. (Copies of the modified Bye-laws, embodying these alterations, have been forwarded, by post, to the Fellows residing within the United Kingdom.)

March 7th, 1861.

Thomas Bell, Esq., President, in the Chair.

Benjamin Carrington, Esq., M.D., was elected a Fellow.

Mr. Busk, F.R.S., Sec. L.S., exhibited the skull of a child between four and five years of age, procured by Mr. Mann in the mountainous region of Fernando Po, and said to belong to a peculiar race of Negroes, inhabiting the higher parts of the island. The skull offered some peculiarities of conformation, which rendered it of considerable interest.

Read, first, "Notes on *Menispermaceæ*, *Tiliaceæ*, *Bixaceæ*, and *Samydaceæ*;" by George Bentham, Esq., V.P.L.S. (See "Botanical Proceedings," 2nd Suppl. to vol. v.)

Read, secondly, "On the Vegetation of Clarence Peak, Fernando Po; with Descriptions of Mr. G. Mann's Plants from the higher parts of that Mountain;" by J. D. Hooker, Esq., M.D., F.R.S., F.L.S. (See "Botanical Proceedings," vol. vi.)

March 21st, 1861.

Thomas Bell, Esq., President, in the Chair.

Mr. David Moore, F.L.S., exhibited a flowering specimen of *Megacarpæa polyandra*, from the Botanic Garden, Glasnevin, where it was originally raised from seeds collected in the Himalaya Mountains by the late Major Madden, and where it flowered for the first time in April, 1855.

Read, first, "On the Possibility of taking a Zoological Census;" by Alfred Newton, Esq., M.A., F.L.S. (See "Zoological Proceedings," vol. vi.)

Read, secondly, "On the true Nature of certain Structures appended to the Feet of Insects and *Arachnida*, subservient to Locomotion;" by Tuffen West, Esq., F.L.S. (See "Transactions," vol. xxiii. part 2.)

April 4th, 1861.

Thomas Bell, Esq., President, in the Chair.

Major Cary Barnard was elected a Fellow.

Mr. Heward, F.L.S., exhibited specimens of *Cælebogyne ilicifolia* and *Gyrostemon attenuatus* from the Herbarium of the late Allan Cunningham; and made some observations upon them.

Read, first, "On the Identification of the Grasses of the Linnean Herbarium;" by Col. William Munro, H.M. 39th Regt., C.B., F.L.S., &c. (See "Botanical Proceedings," vol. vi.)

Read, secondly, "Note on an Unusual Mode of Germination in the Mango (*Mangifera indica*)"; by Maxwell T. Masters, Esq., F.L.S. (See "Botanical Proceedings," vol. vi.)

Read, thirdly, "Descriptions of some new Species of Ant from the Holy Land;" by Frederick Smith, Esq., Assist. Zool. Dep.,

British Museum. Communicated by Daniel Hanbury, Esq. F.L.S.
(See "Zoological Proceedings," vol. vi.)

Read, fourthly, "Catalogue of the Heterocerous *Lepidoptera* collected by Mr. Wallace at Sarawak, Borneo;" by Francis Walker, Esq., F.L.S. (See "Zoological Proceedings," vol. vi.)

April 18th, 1861.

Thomas Bell, Esq., President, in the Chair.

Henry Duckworth, Esq., and David Walker, Esq., M.D., were elected Fellows.

Read, first, "On the Circulation of the Blood in *Pegea*, as bearing on the question of a Lining to the Vascular System of the *Tunicata*;" by J. D. Macdonald, Esq., R.N., F.R.S. Communicated by George Busk, Esq., F.R.S., Sec. L.S. (See "Transactions," vol. xxiii. part 2.)

Read, secondly, "On the Physiology of the Pallial Sinuses of the *Brachiopoda*;" by the same. (See "Transactions," vol. xxiii. part 2.)

Read, thirdly, Extracts from Letters addressed by Gideon Linneceum, Esq., to Charles Darwin, Esq., M.A., F.R.S., F.L.S., "On the Habits of the 'Agricultural Ant' of Texas." (See "Zoological Proceedings," vol. vi.)

May 2nd, 1861.

Thomas Bell, Esq., President, in the Chair.

Robert Hogg, Esq., LL.D.; John Martin, Esq.; and Andrew Murray, Esq., were elected Fellows; and M. Isidore Geoffroy St. Hilaire was elected a Foreign Member.

Read, first, a Letter from Dr. John Kirk to Sir William Hooker, from the Zambesi Expedition.

Read, secondly, a Letter from Dr. Thomson to Dr. Hooker, on some plants collected at Aden.

Read, thirdly, the following "Note on *Omphalocarpon procerum*, Pal. Beauv.;" by George Bentham Esq., V.P.L.S. (accompanied by specimens).

The specimens now exhibited were gathered by Mr. Mann on the Cameroon River, in West Tropical Africa, and from the similarity of the general aspect of the tree, its foliage, and the remarkable fruits growing sessile on the main trunk, I have no hesitation in referring them to the *Omphalocarpon procerum* of Pal. de Beauvois, who found the tree in nearly the same district of West Tropical Africa, and figured it in his "Flore d'Oware et de Benin," vol. i. p. 7, pl. 5 & 6. Our flowers are indeed very different in the details of their structure from those described by De Beauvois; but any one who has much studied the above-quoted work, will have detected many instances where the detailed analyses of the flowers are very incorrect, owing sometimes to the fragmentary state of the specimens, at others to their having been mismatched, or the parts totally wanting supplied from recollection, or even from the imagination of the artist. Our flowers, like his, are females only; but instead of being distinctly gamopetalous, an inch long, with numerous imbricate sepals, I find 5 orbicular, concave sepals, about 3 lines diameter, the 2 outer ones very thick; 5 petals not larger than the sepals, similar in shape, but thinner and slightly connate at the base, where they are also united with the base of the barren filaments; these are numerous and short, the inner ones united in 5 lacinate scales. The ovary is conical with a thin sessile disk-like terminal stigma very minutely toothed; the cells are numerous, annular, with a single laterally attached ovule in each. The fruits, although far from having attained their full size, are as figured by De Beauvois, except that they present in their centre a curious spherical cavity from which the cells radiate. Our seeds are too young to show their internal structure, and still flat; but they have the remarkable long hilum figured.

From these particulars it appears evident that the tree belongs to *Ternstroemiaceæ*, and not to *Sapotaceæ*. In the absence of the male flower, its precise position in the order cannot be fixed. The flowers are those of *Ternstroemiaceæ* proper; the fruit comes perhaps nearest to that of *Pyrenoria*; and the seed, if correctly

described, to those of *Schima* and some *Gordonias*. The uniovulate cells of the ovary are peculiar in the order, as also the very remarkable structure of the pericarp, consisting of a number of woody nutlike particles closely fitting into each other, but easily separable.

Read, fourthly, the following "Note on Rope made of Tree-mallow Fibre;" by John Hogg, Esq., M.A., F.R.S., F.L.S.

"About a year ago I read a short paper on the Tree-Mallow (*Lavatera arborea*, Linn.) to the Society (see 'Proceedings,' vol. v. p. 51), in which I made some remarks on this noble British plant; and I also showed some of the woody stem and bark of a specimen of two years' growth. I mentioned at the same time that its *inner bark* was extremely *fibrous*, though coarse, and that it was evidently well-adapted for being formed into strong *ropes*, matting, and the like purposes.

"I have now the pleasure to exhibit a piece of *rope*, which is made of the fibre from the bark of this plant. It is strong, but coarse in texture, and is well-suited to many ordinary uses.

"The rope-maker who prepared it, said he did not think that it was capable of forming the finer cordage, or of receiving a bright polish, like hemp-fibre; but he considered that, as it seemed to become *stronger* and tougher by immersion in *water*, it would very probably be of much use for water or ship purposes.

"I am, however, inclined to think that, since this specimen of rope was manufactured from the fibres of a plant only *one* year old, the fibrous bark might be finer and of a better quality if taken from a two-years' old, or more mature plant.

"The rope-maker further told me that, as the bark gave out a great deal of mucilage, he was of opinion that it might prove serviceable in the fabric of common paper."

Read, fifthly, "Note on an Egg within an Egg;" by the same.

Mr. Hogg exhibited an egg containing within it a second egg, and stated that "whilst eating a common hen's egg in January 1858, he found *within it* what seemed to be a *second*, perfectly formed, but much smaller egg; the external covering being white and, of course, soft. Its length or longer diameter was about $\frac{9}{16}$ of an inch, and its breadth or shorter diameter about $\frac{7}{16}$. It appeared to have within it a *vitellus* or globular yelk."

Referring to other recorded instances of a similar kind, Mr. Hogg mentioned the following account of a communication made to the Academy of Sciences in Paris, January 7th, 1856, by M. Valenciennes. “ Note sur les œufs à plusieurs jaunes contenus dans le même coque.” “ Les œufs renfermant deux jaunes sont très rares, et ceux à trois jaunes le sont encore plus. M. Valenciennes s’en est procuré un, et il le fait passer sous les yeux de l’Académie. Après quelques considérations sur les œufs de poules à deux ou trois jaunes, l’auteur dit qu’il a observé cette duplicité de jaunes dans les œufs de divers autres oiseaux et de plusieurs mollusques.” (Rev. Zool., 2 sér. tom. viii. p. 32.), and concluded by observing that the instance noticed by himself and presented to the Society differed from all others he had found recorded, in the circumstance that the egg in his case contained not merely a *double yelk*, but apparently a second *perfect small egg*.

Read, sixthly, “ On the Floral Structure of *Osyris peltata* ;” by E. de Crespigny, Esq. Communicated by Daniel Hanbury, Esq., F.L.S.

Mr. Howard, F.L.S., exhibited Specimens of *Cinchona Pahudiana* from Java, and made some remarks upon them.

Mr. Howard also read a Letter, addressed to himself by C. R. Markham, Esq., on the Cultivation of the various species of *Cinchona* in Southern India.

May 24th, 1861.

Anniversary Meeting.

Thomas Bell, Esq., President, in the Chair.

This day, the Anniversary of the birth of Linnæus, and the day appointed by the Charter for the election of Council and Officers, the President opened the business of the Meeting with the following Address:—

GENTLEMEN,

THE circumstances under which I meet you to-day cannot fail to excite in me feelings so different from those which have ever

before presented themselves in my long intercourse with the Society, that I have the greatest difficulty in bringing myself to the expression of any of those ordinary topics which have, on previous occasions, formed the subjects of my annual address.

When on this day 46 years—then a very young man—I was admitted into the Society by its estimable founder, how little could I anticipate that I should have to look back upon so long a period of intimate and happy intercourse with many of the most eminent and distinguished naturalists and other scientific men who have, during that time, adorned this country; that I should have formed so many close and pleasant friendships which have constituted one principal charm and solace of the intervening portion of my life; and, above all, that, after an eight years' tenure, I should now be resigning a Chair which had been previously occupied by men whom it is indeed an honour to have succeeded, and my own occupation of which has been rendered so uniformly happy by the kindness and consideration and forbearance of those who placed me there!

It is, indeed, with no ordinary emotion of gratitude that I look back upon this latter and most important period of my fellowship with the Linnean Society. Called, most unexpectedly to myself, to succeed my late revered friend on his retirement, I might well have shrunk from the responsibility of the office, the arduous nature of its duties, and especially from the disadvantageous comparison between my illustrious predecessor and myself. But having once felt assured that my deficiencies (and no one could, I assure you, be more painfully aware of them than myself) might be, in some measure, obviated by an earnest endeavour to master the difficulties of the position, and an assurance, derived from past experience, that I should receive the warm support of the officers and Council, and that every allowance would be made by the Fellows at large for my inevitable shortcomings, I would not allow my misgivings to prevail against the expressed desire of so many of the Fellows. If, as I am assured, I have fulfilled those duties in any degree to their satisfaction, I most thankfully attribute it to the wise counsels, the cordial co-operation and support, and the lenient judgment with which I have at all times been favoured. Still the retrospect of the last eight years cannot but leave a mixed impression on my mind. The recollection of many mistakes (I fear but imperfectly rectified), of opportunities of usefulness neglected and of duties only partially fulfilled, must and ought to cause some regret, especially when it is considered that

the time for improvement is passed, and that in my case is falsified the adage, "Never too late to mend."

The period during which I have been in office has been an eventful one ; perhaps I do not exaggerate when, in this respect, I compare it advantageously with any other similar period in the history of the Society ; and it will not, I think, be uninteresting or useless if, in my brief valedictory address, I recur to some of the more remarkable events which have distinguished it, with the view of examining how far we have progressed in the fulfilment of our mission, and what has been the result of our work, either within our own immediate circle, or in the more extended sphere of our influence, or of our external relations.

One of the earliest changes which occurred in our arrangements was the establishment of the Journal of Proceedings. Many of you will recollect that before this plan was adopted, papers were occasionally read at our meetings which, however valuable they may have been in themselves, neither required the quarto form for their illustration, nor appeared, in other respects, to be adapted for that mode of publication. In addition to this, the accumulation of important matter which called for more speedy publication than could be effected by the annual issue of the Transactions, demanded, so to speak, a supplementary channel for its appearance. It was proposed that these requirements should be fulfilled by the octavo form of publication to which I am alluding. The innovation was so considerable, and that too in a body so eminently conservative as ours, that its proposal excited much attention, and was discussed with the freedom, and, at the same time, with the deliberation, which so important a change demanded. The result of much and deep consideration was the adoption of that form, which has ever since been carried out with a degree of regularity, greater, perhaps, than could have been reasonably expected, when it is considered upon how many contingencies its periodical issue depends. The success of the experiment (for such it was at its commencement) has fulfilled the anticipations of its warmest advocates ; and the satisfaction with which it has been received, not only by the Society, but by naturalists who were not of our body, both in England and abroad, has, I doubt not, contributed greatly to raise the character of the Society, to extend its usefulness, and in no small degree to increase our numbers by the accession of many a good working naturalist.

The most striking event, however, of the period of which I am

now speaking, was the removal of the Society from its old home in Soho Square to our present commodious and most desirable location; and in connexion with this important movement, our close approximation to the Royal Society, and the increased intercourse which we have enjoyed with that body since our juxtaposition. I think I may venture to say that all our most sanguine expectations, as to the advantages and pleasures of that relation, have been amply fulfilled. We have now enjoyed four years of prosperous occupation here, and in addition to the pecuniary advantage of immunity from rent, the increased accommodation in regard to space, and the greater convenience and beauty of our rooms, the success which has resulted from these circumstances in the scientific prestige which the Society has acquired, the great addition to our numbers and the increased extent and higher character of our publications, has shown how important to our welfare was the change which we then effected. This advantage has not, however, been enjoyed without an occasional cloud of doubt as to the duration of our occupancy; and it will be in the recollection of some present that I felt myself called upon in the year 1859 to allude in a particular manner to the proposals which were made, and which there was every reason to expect would be carried out, to cover the site of Burlington House and the vacant ground behind it, with buildings destined for the mingled occupancy of Government Offices, of Scientific Societies, and of the Royal Academy, and other institutions connected with art. This scheme is, for the present at least, abandoned; and we shall probably be left in undisturbed possession of our present abode for many years to come. The Royal Academy, by the recent extensive improvements in the present galleries, appear to have given up any idea of removing, and we shall be spared the threatened absurdity of the appropriation of the whole area in front of Burlington House, including the site of the present matchless colonnade, as a stand for carriages, useful only during the brief period of the Academy's annual exhibition.

If, however, the memorial of the last eight years present us with a general result of almost unprecedented prosperity, that period has been no less conspicuous in our history for the number and the melancholy importance of our losses by death.

In a Society so numerous as ours we must, according to the invariable statistics of mortality, annually have to lament the loss of many of our number, notwithstanding the length of life and of membership by which our list is distinguished, I believe, beyond

that of any other institution of the kind. The average of the age of our deceased fellows during this period is nearly 70 years, and of the term of fellowship not far from 34 years; and amongst those of whom we have been deprived are some who stand prominently forward in both these respects, more than one having numbered between ninety and a hundred years of life, and upwards of sixty of membership. Still the mortality goes on, and, year after year, those who, like myself, have grown old in connexion with the Society, see one after another of our old companions in the field of scientific labour and enjoyment, falling off from our side and beckoning to us to follow. In the brief space of eight years what a company of our old friends and associates have been removed from us! It is a brilliant but a sad array: Jameson, Newport, Stokes, Wallich, De la Beche, Edward Forbes, Greenough, George Sowerby, Dillwyn, John Reeves, Swainson, Buckland, Pepys, Yarell, Royle, Broderip, Robert Brown, Richard Taylor, Dawson Turner, Henfrey, Horsfield and Spence, Bracy Clark, Hamilton Smith, and now, within a fortnight, Fitton and Henslow. From our foreign list we miss the honoured names of Adrien de Jussieu, of Charles Bonaparte, of Lichtenstein and Müller, Nees von Esenbeck, Bonpland, Temminck, Humboldt, Agardh, and the veteran Duméril.

Turning from the mournful impression which this enumeration must leave upon our minds, let us dwell for one moment on the other side of the subject, and whilst we gratefully acknowledge the accession of many younger members who have already attained deserved eminence, or who are advancing in the same road to honourable fame and distinction, let us look around amongst the fast-increasing numbers of the students of natural science who have not yet joined our ranks, and enlist them under our banner, to fill the places of those whose honoured names I have recited, that not only in numbers but in scientific status the Linnean Society may still maintain its high character.

The changes which have recently taken place with reference to the promotion of the study of Natural Science in the University of Oxford are so important, that I must be allowed to occupy a few moments of your time in a passing allusion to them.

In the year 1855 I took occasion to refer to the transition state which these studies were then undergoing at that great school of learning. The sum of £30,000 was to be set apart for the building of a Museum. Collections of great importance were either

actually in the possession of the University and waiting for a resting-place, or they were pouring in from various quarters. The Natural History tripos was proposed. The appointment of a Professor of Zoology, until that time unknown in either University, was looming in the uncertain distance. What do we now see? The Museum built and partly occupied; the collections increased to an extent which could scarcely have been anticipated, chiefly through the munificence of one of our Fellows, the Rev. F. W. Hope; the natural history specimens in the Ashmolean Museum transferred to the new Museum; honours conferred as a reward, in part, of a proficiency in natural knowledge, and a Hope Professor of Zoology actually appointed in the person of our own esteemed and talented Fellow, Professor Westwood, and this provided for by an act of liberality, unexampled in late years, on the part of the same gentleman to whom I have before alluded. Professor Westwood is incessantly and energetically employed, in conjunction with his colleagues, in carrying out these objects. At present these absorbing duties necessarily occupy so much of his time that we have to regret the temporary suspension of those original researches which have so much enriched entomological science; but he is thus preparing not only the means of his own future contributions to scientific literature, but especially laying the foundation of a school of natural science in our oldest University, which, I fully anticipate, will at a future day be unsurpassed in this country.

Turning to Cambridge, alas! one sole event absorbs all our interest, and calls up all our sympathy. Within the last few days, and almost before the ink was dry with which I had recorded on these leaves the too sure anticipation of the approaching fatal result of our admirable friend's illness, came the announcement that the University had been deprived of its excellent Professor of Botany, and we have to mourn the loss of as kindly and genial a spirit, and as honest and true a man, as ever endeared himself to his friends, or ever lived without an enemy. Professor Henslow has been so well and so long known, and his merits are so universally appreciated, that I need not dwell upon them here. I will only say that our grief for his loss is enhanced by the hopelessness of soon supplying his place in our esteem and affection, or his equal in the earnestness, zeal and success with which he carried out his benevolent schemes of enlarging and purifying the enjoyment of his peasant parishioners, by opening to their minds the beauties of nature, and showing them, as a Chris-

tian clergyman ought to do, that that religion is an imperfect one which stops short of exhibiting the great Object of our worship as the beneficent Creator of all that is pure and beautiful around us. His own love and enjoyment of nature was intense, and his benevolence was such that he could not be satisfied without enabling others, and especially the poor and children, to enjoy the same pleasure with him. There was, too, a remarkable unity and consistency, and, if I may so speak, a keeping in his character which is very rare. "The elements were so mixed in him," that whilst there was no excessive preponderance of any one quality at the expense of others, so there seemed to be no deficiency in any of those qualities which deserve and ensure universal respect and love, and which are essential to the completeness of the manly and Christian character.

I need not detain you by any detail of our scientific proceedings during the past year, as they are already, or will shortly be in your hands. It is sufficient for me to appeal to our publications and to your experience of the character of our meetings, to show that neither in regard to the scientific value of the papers read, nor to the interest of our conversational discussions, has there been any falling off from the progress which we have for a long time been enabled to record ; and I believe that the Society has never evinced a more sound and healthy vitality than at the present time.

With regard to our financial position, which is so important an element in our prosperity, it is peculiarly gratifying to me to state that we have never been in a more satisfactory condition. At the last Anniversary, I mentioned that the last item of our bonded debt had just been paid off, but that payment had occurred too late to be included in the yearly account. It is therefore only in the Auditors' Report of the present year, that we have been able to announce our absolute immunity from the incubus of debt ; whilst the balance in our hands is so considerable, that the Council has determined upon adding to the funded capital by the purchase of £200 in the Consolidated Fund. This is the first instance in which any sum has been funded by us, irrespective of legacies or other adventitious aid ; and when this fact is considered in conjunction with the paying off of the only remaining item of our bonded debt, to which I have alluded, I cannot but heartily congratulate you upon so auspicious a fact, because there appears every probability that, in future years, the whole of the sums received in composition for annual payments may be similarly in-

vested. I need not say that it has always been my most anxious wish that this important object should be as soon as possible attained.

The independence of the Society and its free action can only be secured by the possession of a fund on which to fall back in case of any temporary suspension of prosperity, or of any contingent call for unusual or unexpected expenditure.

Although I have not thought it necessary to enter into any detail of our own corporate acts, I think it will be interesting to you to learn that in the completion of Mr. Benthams's 'Flora of Hongkong,' we have, I believe, the first example of a colonial flora published under the auspices of the Colonial Secretary, with Government aid, and that the first volume of the 'Flora Capensis,' by Dr. Harvey and Dr. Sonder, has also been issued with the assistance of the Cape Government. It is much to be desired that these examples of the publication of the Natural History of our Colonies under the auspices of Government should be followed out with a judicious and well-applied liberality.

The spread of the love and study of natural history, and its teaching by means of lectures and the formation of local museums, is as satisfactory in our English provinces as I last year described it to be in Ireland. At Leeds, the sum of nearly £8000 has been raised for enlarging and improving the museum belonging to the Literary and Philosophical Society, which, owing in great measure to the efforts of the Rev. T. Hincks, is rapidly acquiring importance. The collections there are both extensive and interesting. Two volumes of 'Transactions' have been published in former years. The County Museum at York is an admirable one, and very useful lectures are delivered there. At Newcastle-upon-Tyne, there is the nucleus of an excellent museum, "which," says my informant, "is extending by the efforts of some energetic young men, aided by a legacy from the late Robert Stephenson and donations from Sir William Armstrong and others. There is also a flourishing Microscopical Society, and other institutions having more or less the object of the cultivation of natural history." The Tyneside Naturalists' Field Club is a society of very respectable standing, and, as I have long known, admirably conducted. The number of members was at Christmas last no less than 345, and it is still steadily increasing. I have seen several parts of the 'Transactions,' which are highly creditable, and no papers are published but such as are strictly on local subjects. Similar institutions, as I am informed, exist at Manchester and some other places.

The well-known Literary and Philosophical Society of the last-named city still keeps up its character, and a Microscopical Society in the same place is also in active operation. The details of the working of the society, especially on the products of the deep-sea soundings, are highly interesting, and but from a desire not to detain you too long, I should have willingly devoted a few minutes to their enumeration.

At Alton in Hampshire, at Bedford, at Wakefield, and many other places distant from the Metropolis, as well as in the suburbs, societies having these objects are established; and even in the far Orkneys a Natural History Society is actively engaged, under the direction of the Rev. Mr. Stobbs, in forming a complete collection of local objects of natural history. If I glance at the vast improvements in Kew Gardens and the increased number of visitors there, as well as at the Zoological Gardens, I have laid before you sufficient proof of a vast advance in the popular recognition of Natural History as a rational source of enjoyment.

I return now, Gentlemen, to our more immediate interests. It had long been felt that considerable advantage might be anticipated from the appointment of a second secretary instead of the under-secretary recognized by the bye-laws, and that one of the two secretaries should be considered as representing the Zoological and the other the Botanical element in conducting the business of the Society. As this arrangement would require an alteration in the bye-laws, and as the whole of our code was thought to demand a revision, for which we were not at the time prepared, Mr. Busk kindly consented to act as the Zoological Secretary, under the title of under-secretary, until the retirement of Mr. Bennett from an office which he held for twenty years, with a zeal and constancy and talent which laid the Society under the deepest obligations to him, whilst his unfailing courtesy and kindness endeared him to every one who was brought into connexion with him. I hope I shall be pardoned a momentary digression, whilst I congratulate the Society and our friend himself upon his comparative restoration to health, and upon his being able once more to cheer us by his occasional presence amongst us, and in particular by his valuable assistance in the Council.

At this time Mr. Busk being elected Secretary, Mr. Currey allowed us the advantage of his services under the old title, until that alteration of the bye-laws, which you have recently confirmed, enables you this day to elect him as joint Secretary with Mr. Busk. It is not necessary for me to enter into any detail on the subject

of these alterations. They were made by the Council after the most mature deliberation, and I believe that every one who compares their present with their past state will acknowledge that every change has been an improvement.

The vacancy occasioned by the much-regretted retirement of Dr. Boott from the office of Treasurer, has been proposed to be filled up by the nomination of Mr. Wilson Saunders—an arrangement which needs no recommendation from me to secure the cordial approval of the Society. But, to my sorrow, I have to announce that, whilst retiring from office, Dr. Boott has also signified his desire not to be re-elected into the Council, a circumstance which will be felt by the whole Society as a serious loss.—After having acted as Secretary and as Treasurer for many years, during which his services in both capacities, and as a member of Council, were invaluable, whilst the gentle urbanity of his manners, his warmth of heart, and the never-failing interest he always took in the welfare of the Society caused him to be regarded with the deepest personal esteem and respect, his removal from a position which kept him, as it were, in continual and close relation to us, will be felt by us all as a very painful breach in our brotherhood.

Before I take my leave, Gentlemen, I cannot but advert for a moment to the very important duty which will devolve upon you this day—the choice of a new President. When, from circumstances with which I have no occasion to trouble you, I decided upon inflicting on myself the severe self-denial of requesting the Society not to re-elect me as their President at this Anniversary, I considered it my duty to confer with the Treasurer and some other of the older members of the Council as to the gentleman whom I should propose as my successor. The first consideration was, that he should be a Botanist, and it appeared to me and to my friends and consultees, that there could be no hesitation as to the distinguished person who should be proposed to the Council for their nomination. Mr. Bentham's extensive—may I not say unequalled?—knowledge of scientific botany is too well known to need any eulogy from me. We have all for years past been accustomed to listen with admiration to his papers in this room, and to the good sense and extensive information which he has thrown into our discussions.

But there is one claim which Mr. Bentham possesses to the suffrages of the Linnean Society in particular, on which no one is more entitled to speak than myself, and that is the remarkable

wisdom, knowledge of business, and tact which have always distinguished him in the Council, and for which I now beg leave to express most strongly my own obligations and those under which the Society at large lies to him. I hope Mr. Bentham will accept the assurance of my most earnest wishes that he may long continue to occupy a chair which he is so well able to fill; and that, while the Society enjoys the benefit and prestige of his Presidency, he may ever receive the same confidence, the same kind consideration, the same affectionate attachment, as that with which for the last eight years I have been honoured.

OBITUARY NOTICES.

The Secretary then read the following notices of deceased *Members*.

George Earl of Aberdeen, whose name for the last twenty-five years has stood at the head of the list of Fellows, died on the 14th December, 1860.

The well-known public character and career of this distinguished patron of literature and art, and the absence in him of any pretension to scientific fame, render it unnecessary here to do more than express the deep sense which this Society, in common with the whole British Empire, cannot fail to entertain of the great public loss sustained by the decease of one so long eminent as a statesman and so distinguished by the excellence of his public and private character.

Robert John Ashton, Esq., was by profession a solicitor, residing at Pelham Crescent, Brompton, and having chambers in New Inn. He was the eldest son of Robert Ashton, Esq., of Brompton, by Mary, daughter of J. A. Schwenk, Esq., and was born at Brompton in 1812. Educated by the late Rev. Dr. Lewis at Twickenham, he was admitted a solicitor in 1836.

As he was possessed of good independent property, he followed his profession more as a means of occupation than of profit, and in the exercise of his avocation the strong tendency of his mind to scientific and antiquarian pursuits led him to cultivate law as a science, and to investigate the intricacies of titles rather than to engage in active practice.

Mr. Ashton was a good classical scholar and well versed in the German and French languages; but the natural bias of his mind was better exhibited in scientific and antiquarian studies, and especially in that of natural history. Thus chemistry, botany,

entomology, geology and numismatics successively occupied his attention. He became a member of the Entomological Society in 1835, and contributed some valuable papers in the second and third volumes of its 'Transactions.' He was elected a Fellow of the Linnean Society in 1839.

Mr. Ashton was possessed, according to his biographer in the 'Law Times,' whence I have taken this short account of his life, of no ordinary mental powers, great originality of thought, and was familiarly versed in biblical lore. Of strong religious feeling, he took a lively interest in most of the popular religious societies of the day; at the same time he was a man of strict integrity, charitable, upright and uncompromising almost to a fault.

He died at Richmond, on the 26th of August, 1860, at the early age of 47, and was buried at Kingsbury, Middlesex.

Philip Edward Barnes, Esq., B.A., occupied the post of Danish Consul at Coquimbo. He was the son of Mr. Philip Barnes, an old Fellow of the Society, and one of the originators of the Royal Botanic Society, in whose service his son was at one time engaged as Assistant Secretary.

Mr. Barnes was elected into the Society on the 18th of December, 1838, and died at Copiapo, Chili, on the 2nd of October, 1860.

Bracy Clark, Esq., the "Father of the Linnean Society," died on the 16th of December, 1860, at the advanced age of 90, having retained his faculties in almost full vigour to the last. In his own profession he was esteemed one of the most eminent, if not the most eminent, of veterinarians. At any rate, he was one of the first in this country to apply the resources of a liberally educated and well-informed mind to the study of the veterinary art, which, since the establishment of the college, has deservedly been admitted into the rank of a profession. He was born at Chipping Norton, in Oxfordshire, on the 7th of April, 1771, the ninth and last child of his parents, who belonged to the Society of Friends, and both of whom died within a few weeks of each other, before their youngest-born was two years old. He was left under the guardianship of a near relative, Mr. John Zachary, and at 8 years of age was placed at school at Barford, where he had a favourable opportunity of acquiring classical knowledge, and had among others for contemporaries, Luke Howard and Sampson Hanbury—names since as much distinguished as his own in their respective walks.

When 14, he was apprenticed to a surgeon at Worcester, under whom and his successor, he continued to improve his classical knowledge, and acquired a practical acquaintance with the art of

medicine. During this period, he took great interest in chemical and mechanical pursuits, and is said to have constructed several ingenious machines.

His earliest predilection in natural history was for the study of entomology, and he made an extensive collection of the insects found in the neighbourhood of Worcester; but though he was doubtless animated by a strong love for this branch of knowledge, the scientific principles by which he was guided are not very obvious, when we find it recorded that he would not admit any insect into his collection but such as had been described by Linnæus; any new forms apparently being regarded by him as unauthorized interlopers. To entomology he soon added botany, as it was then understood, as an object of pursuit; and these tastes appear to have been beneficial to him in more ways than one; for besides the useful and instructive training his mind thus received, his pursuits were the means indirectly of introducing him to a more refined and intelligent, or at least more learned society, than might otherwise have been accessible to him.

At the end of his apprenticeship, and when he had reached the age of 21, Mr. Clark proceeded to London, with a view, apparently, of pursuing his medical studies. Through his guardian, Mr. Zachary, he was introduced to the notice of Sir Joseph Banks, under whose auspices, probably, he was elected a Fellow of this Society on the 15th of January, 1793—that is to say, within about five years of its foundation.

His medical studies were commenced under John Hunter, whose place, however, in Windmill Street, was about that time supplied by Sir E. Home, and he had for fellow-students amongst the famous dead, Thomas Young, Anthony Carlisle, Abernethy, and Astley Cooper, and of the illustrious living Mr. Lawrence, who still remains amidst us in almost unimpaired vigour and activity of mind and body. But, although Mr. Clark appears to have regularly attended the medical classes, his choice from an early period was to devote himself to the veterinary art, to the practice of which his medical and scientific studies were the best possible introduction. To this he was incited by his elder brother Mr. Henry Clark, who was a lover of horses, and noted in the sporting circles. In the pursuit of his special branch, he early attached himself to the Veterinary College, about that time established in St. Pancras, and into which Mr. Clark used to mention with delight, that he officially led the first horse as a patient.

In the year 1797, he resolved to visit one of his sisters, who was

married and settled at Lausanne. On the passage to Hamburg, however, in a Yarmouth packet-boat, the vessel was captured by an American privateer, and taken into a Dutch port, where the passengers received some hard treatment, and were robbed of all they possessed, though Mr. Clark's loss fortunately does not appear to have been heavy. He remained on the Continent for about two years, and travelled through Holland, Denmark, Germany and Switzerland at a time when travelling was not quite so easy as in the present peaceful times; and many testimonials are extant of the consideration he obtained among men of science for his industry, intelligence, and energy. Having in vain endeavoured to obtain permission to enter France with the view of studying at the celebrated veterinary schools of Paris and Lyons, he returned to England, and commenced practice in London, where he soon attained the most eminent position in his profession. In the course of his practice he appears very early to have felt that it was out of the natural order of things that horses should, after some years' usage, so often become *lame*, a term under which he included every defect in stepping, and in the detection of which he possessed a very keen eye. In his 'Hippodamia,' he has left a very interesting account of his researches into the cause of this lameness, which were rewarded by a discovery, in his own estimation at any rate, "second to none that has ever been made on the subject of horses." This was what he termed the "principle" of the elasticity or expansibility of the animal's foot. This so-termed "principle," however, had been previously recognized by Mr. Freeman in his work on the 'Mechanism of the Horse's Foot,' which was published in 1796. At the present day, we can only wonder that so obvious a fact should ever have been overlooked by the most barbarous farrier, and that it should have been reserved for the last sixty or seventy years to erect it into a "principle."

The application, however, of this "principle" in the shoeing of horses seems to have been a more difficult problem than its discovery, and to have engaged the attention and laborious ingenuity of many veterinarians. Mr. Clark was occupied more or less in the solution of the question up to the last year of his long life, and, in fact, his experiments in this regard appear to have absorbed no small portion of the very considerable gains he made by the practice of his profession. His zeal in this subject we cannot perhaps wonder at, when we learn that, in his opinion, the horse would attain to the age of fifty, were it not for the cruel sufferings occasioned by the imprisonment of its feet, the cutting of the *frog*,

and the otherwise cruel treatment experienced by it at the hands of smiths in general.

Among Mr. Clark's published works should be enumerated, first, his papers published in our 'Transactions,' consisting of 1. "Observations on the Genus *Æstrus*," which was read November 1st, 1796, and published in the third volume of the 'Linnean Transactions.' 2. "Of the Insect called *Oistros* by the Ancients, and of the true Species intended by them under this appellation; in reply to the Observations of W. S. Macleay, Esq., and the French Naturalists: to which is added a Description of a new Species of *Cuterebra*" (*Ibid.* vol. xv. pp. 402-411); and 3. "An Appendix or Supplement to a Treatise on the *Æstri* and *Cuterebræ* of various Animals" (*Ibid.* vol. xix. pp. 81-94; and Proc. Lin. Soc. vol. i. pp. 99-100). The "Observations on the Genus *Æstrus*" were republished in an amplified form, in 1815, under the title of 'Essay on *Æstri*.'

Mr. Clark's first appearance as an author, however, was in the 'Gentleman's Magazine,' where he gave "A short Account of the celebrated Race-horse Eclipse," which was written in so lively and pleasing a style as to attract considerable attention.

Among his numerous other works may be mentioned his elaborate treatise on the 'True Structure and Economy of the Horse's Foot;' his 'History of the Veterinary Art;' a 'Treatise on the Bits of Horses;' and a 'Memoir on the Vices of Horses;' an 'Essay on the Knowledge of the Ancients respecting the Art of Shoeing the Horse;' all of which, to borrow the words of his biographer in the 'Edinburgh Veterinary Review,' "testify to his untiring perseverance, devotion to veterinary science, and his profound knowledge of the subject."

To conclude in the words of the same writer, who is far better entitled than I am to express an opinion, "Few men have had the privilege of working or writing in true earnest for the length of time that Bracy Clark laboured in the cause of veterinary science. The progress in the purely scientific department of that profession in this country during the last seventy years has been due almost entirely to Bracy Clark. The reputation of British veterinarians on the Continent is mainly attributable to his efforts."

William Henry Fitton, M.D., F.R.S., F.G.S., died on the 13th May, 1861, at the advanced age of 82. Though never a contributor to our 'Transactions,' no man was better known or more warmly esteemed than Dr. Fitton in all scientific circles. Justly eminent among geologists, he may be regarded as one of the earliest and

most zealous founders of the British School of Geology. His early labours, commencing more than half a century ago, on the geology of Hastings and its neighbourhood, and these, together with his works on the strata intervening between the chalk and oolite in the South-east of England and in the Isle of Wight, published as they were at an early period in the history of the science, speedily raised Dr. Fitton to a European reputation, which was not only maintained, but enhanced by his subsequent career.

In 1827 he became President of the Geological Society, in which capacity he was the first to set the laudable and useful example, since so amply and ably followed by his successors, of giving an annual *résumé* of the general progress of the science. In 1852 he received the Wollaston Medal, presented to him by the Society for his eminent scientific services. Besides his strictly scientific publications, Dr. Fitton contributed several articles on the early history of geology to the 'Quarterly Review' and other periodicals.

John Stevens Henslow. As I feel that it would be impossible for me to do equal justice to the subject of the following notice, or to express in anything like such adequate terms what is due to the memory of Professor Henslow, I have thought it better, with the due permission, to insert in the records of the Linnean Society, the eloquent and complete account of his life and labours contained in the pages of the 'Gardeners' Chronicle' for June 1, 8, and 15, 1861.

"There are few men whose loss will be more generally deplored, whether as a clergyman or as a man of science, than the subject of this notice; nor are these his only claims to be regarded as a benefactor of his race, for there are few whose personal influence for good on the social, moral, and religious characters of those with whom he has been associated or laboured, has been so deeply felt or so gratefully acknowledged. To give even a sketch of the varied attainments and personal qualifications that were so blended in Prof. Henslow as to render him at once the most popular and useful man of science of his day, is quite impossible here; for they depended on a combination of rare qualities of head and heart; each natural, but all well trained and conscientiously cultivated by their possessor during a long period of his life. Amongst them, however, should be mentioned some personal and other features, which, as being in a great measure due to temperament and mental endowment, were inherent and characteristic of all periods of his life: these were a sense of truth and fair play, so instinctive, that deception or even reticence when the cause of truth was at stake

were things almost unintelligible to him; a geniality of disposition that rendered him an attractive companion from his childhood upwards; a temper of which he was never known to lose command, even by his most intimate friends; an organization of brain that rendered all subjects of study equally easy of acquirement; a keen love of nature and of natural knowledge, and ardour in communicating it; a quick perception, excellent powers of generalisation, the largest charity, a total absence of vanity or pride, a winning countenance, and a robust frame. Few men indeed were more gifted by nature to take a commanding position in the many spheres of life, in one or other of which he was always busy; few had more need of that balance of powers of mind which his University tutors recognised as something unusual, and the phrenologists accounted for by the form of his head, which they considered faultless. That this is no exaggerated estimate of the subject of this sketch, the following brief notice of his career will prove.

“He was born on the 6th of February, 1796, at Rochester, where his father was in business as a solicitor, the eldest of eleven children, of whom four sisters only survive him. His scientific powers and love of natural history, which were very early displayed, were inherited both from his father, who was a great reader of natural history books, and devoted to the observation and keeping of birds and other animals, and from his grandfather, Sir John Henslow, surveyor of the navy, who united to a scientific knowledge of naval architecture, great ingenuity and skill in designing. He was educated first at a free school in Rochester, and afterwards at Dr. Jephson’s, of Camberwell. During the former period he delighted in making excursions on the Medway, and especially in hunting for insects, and in rearing them and observing their habits. It was during the latter period that he first learned how to arrange and systematize; and the delight in analysing, understanding, and illustrating, gradually equalled that of collecting; and these were thenceforward the ruling passions of his life.

“In 1814 he was entered at St. John’s College, Cambridge, and graduated as 16th Wrangler in 1818, in which year also he joined the Linnean Society. During his college career he continued an active naturalist; declining to compete for the much higher academic position which, with his mathematical powers, he might easily have attained, he preferred substantial knowledge, studied chemistry under Prof. Cumming, mineralogy under Dr. Clarke, laboured hard at geology as an original inquirer with but little aid, and became a Fellow of the Geological Society in 1819.

“ In 1821, at the early age of 23, he appeared as an author, communicating to the Geological Society his ‘ Supplementary Observations on Dr. Berger’s Account of the Isle of Man,’ containing a map and sections, to the preparation of which he had devoted his spare time whilst spending two long vacations on that island with pupils. At about that period the same duties also led him to the Isle of Anglesea, the geology of which he diligently explored, and embodied the results in a most elaborate paper, printed in the first volume of the ‘ Cambridge Philosophical Transactions.’ This paper not only at once raised its author to a very high position, and caused such a demand for the volume in question that it was soon out of print; but it is to this day quoted by geologists as a model of truthful and sagacious scientific research. It possesses also rare merit, as combining with great power of co-ordinating physical features, skill and accuracy in the application of chemistry, mineralogy, mathematics and drawing to the illustration of a very complicated mountainous region.

“ At this period, too, his physical powers were equal to his mental; and during his geological excursion in Anglesea he once walked 40 miles in the day, with his hammer and specimens on his back, and danced all the following night at a ball!

“ About the same year Professor Henslow took up botany with the same zeal and method which he had devoted to other branches of science, being, it is believed, first attracted to morphology and physiology. He soon, however, found that no satisfactory knowledge of these branches could be acquired without a previous acquaintance with systematic botany; and this, joined to his ardour for collecting, led him to the formation of a herbarium, in which he displayed not only the specimens, but the structure of their organs, their relations, variations, and aberrations. In 1822 the Professorship of Mineralogy becoming vacant, he became the successful candidate; he held the appointment for three years, conscientiously devoting the whole of his time to the study, and especially to the chemical and crystallographical branches of it, for which his mathematical powers and previous training eminently qualified him. He prepared and published an admirable syllabus of his course of lectures, followed by a systematic list and analytical tables, drawn up with the same scientific precision and clearness that characterize all his labours.

“ In 1825 the Professorship of Botany became vacant by the death of Professor Martyn, and for this Professor Henslow resigned the mineralogical chair; applying all his energies and ma-

nifold acquirements to his new post (which had been wholly neglected for many years), and speedily raising it from obscurity to renown. He immediately arranged a course of lectures at once scientific, practical and popular, gave chemistry and physiology their legitimate places in botanical teaching, and, by applying his mathematical powers in giving a prominent place to the geometrical problems involved in phyllotaxis, he awakened interest in a study to which some of the mathematicians of Cambridge had hitherto hardly accorded the dignity of a science. Nor did he neglect the more practical duties of a teacher; no one knew so well as he did that to make botanists of students they must quickly be brought to believe that in some directions, at any rate, they can and ought to walk unaided; he therefore took them on excursions, taught them early how to name plants by an artificial use of the natural method; gave each confidence in his earliest efforts, and led them on by example, teaching and encouragement. Nor did botanists and undergraduates alone profit: his lecture room was attended by senior members of the University, and his excursions by entomologists, conchologists, and geologists; each deriving knowledge in his own speciality from him, and he from them: thus exciting amongst his pupils an admiration for his manifold acquirements that was only equalled by their love of his personal character.

“For 14 years Professor Henslow resided at Cambridge as botanical professor, during which period the income attached to the chair was very small; this was, however, no obstacle to his instituting weekly evening meetings at his own house for the reception of every one interested in science, including under-graduates; to which all were invited to bring specimens of interest in any branch of science; and at which there was free intercourse between young men and ‘dons’ of every degree. This practice, previously unknown in the University, and, we regret to say, as yet unfollowed, was a step of immense importance in diffusing a taste for science, no less than in inciting the young men to intellectual pursuits.

“During this period he contributed two papers to the Cambridge Philosophical Society on a hybrid *Digitalis*, and the structure of the Mignonette, both of the highest merit as works of philosophical research, and which established his reputation amongst continental naturalists: he also wrote the volume on Botany for Lardner’s ‘Cabinet Cyclopædia,’ an admirable little work, of which two editions have been sold, and a third was under revision at the time of his decease. It is a noticeable fact, that since Professor

Henslow's departure from Cambridge, not a single botanical paper, and very few on other branches of natural history, have been contributed to its Philosophical Transactions, of which he was one of the founders.

“ In 1823 Professor Henslow married a daughter of the Rev. George Jenyns, of Bottisham Hall, in Cambridgeshire; and in 1825 he took orders as curate of Little St. Mary's, in Cambridge. In 1833 he was presented by Lord Brougham, then Chancellor, to the Vicarage of Cholsey-cum-Moulsford, in Berkshire, where he resided during the summer months of three years, passing the rest of his time at Cambridge as before. In 1837 he was transferred by the Crown to the valuable Rectory of Hitcham in Suffolk, and there from 1839 until his death, he resided throughout the year, with the exception of six weeks of the Easter term, when he lectured during the week in Cambridge; for many years returning to Hitcham for the Sunday service.

“ To the duties of his new position Professor Henslow brought the same energy, and the same love of bettering his fellow-creatures as had distinguished him in Cambridge, together with increased fervor for teaching, matured faculties, and a deep sense of his responsibility in ministering to the spiritual and temporal wants of a large and wofully neglected parish. His flock were notorious for belief in witchcraft, drunkenness, poaching, sheep-stealing and other immoral habits; they consisted of field labourers living in wretched hovels, and of farmers, who, being intellectually little better than their servants, were doggedly opposed to any change in their moral or physical condition. Here was work requiring all Professor Henslow's indomitable energy and multifarious resources; no one knew better than he what is the result of throwing good seed on stony ground, and he consequently laid his plans for tilling and fertilizing the ground committed to his culture with such sagacity and skill, and carried them out with such unflinching steadfastness of purpose, that within less than a quarter of a century he reaped his reward hundred-fold, and died with a harvest garnered. It is quite impossible to estimate the amount and kind of moral courage required for a clergyman to break down the sturdy opposition to change of the farmers of twenty years ago; but his neighbours had to do with one who never determined on a plan of action without carrying it into successful effect, and whose downright honesty, frank bearing, and imperturbable temper, were weapons proof against the outbursts of prejudice, avarice, and malice with which he was assailed.

“ On Professor Henslow’s arrival at Hitcham the parish consisted of upwards of 1000 persons, scattered over more than 4000 acres ; and the poor-rates amounted to 27*s.* per head, women and children of all ages included ! Moreover parish relief was not unfrequently levied by bands of 40 or 50 able-bodied labourers, who intimidated the previous rector into instant compliance with their demands. The church was all but empty, and baptism and the marriage ceremony were practically regarded as superfluities or luxuries ; whilst with regard to food, clothing, and the means of observing the decencies of life, the inhabitants were far below the average scale of the peasant class in England. His first step was to attach the labourers to himself, and induce them to regard him as a friend. For this purpose, being a capital pyrotechnist, he invited them to the rectory lawn in the evening and amused them with fireworks, and then gradually introduced to their notice many simple objects of domestic use hitherto unknown to them ; and having once gained their confidence he lost no time in setting to work on a plan that should tell at once both on their bodies and minds ; knowing well that it would be necessary to raise their condition to that of rational beings, and secure some feeling of independence among them, before he could act with effect on the class which held them in bondage. To this end he caused a school-room to be built, and a mistress appointed—both on a very humble scale, for he had but slender support from his parishioners ; indeed, greatly as the building and the stipend of the mistress are now increased, it has been mainly through his liberality ; his subscriptions having often doubled those from all other persons. In the school he so arranged the method of teaching, that the sympathies as well as the faculties of the children were aroused by a combination of the religious and secular elements. The children were taught their duty to God, to one another, and to themselves ; the latter by means that were long thought Utopian, but are now recognized as efficacious beyond precedent ; we allude to the introduction of Natural History as a means of sharpening the observing and reasoning faculties, and giving the children an increased reverence for their Creator’s power, a knowledge of common objects, and a pursuit in which they can take equal interest in the fields or at home.

“ Professor Henslow’s method of teaching village children botany, and the success that has attended it as an educational measure, quite apart from the information given, have often been noticed ; it is now the theme of universal praise, it has been taken up by

the Council of Education, and is being carried out in various parts of the country. We cannot here dwell on its manifold advantages to an agricultural people, how it influences their daily habits in after-life, as well as advances their material interests as rearers of vegetable produce; and we must refer to the numerous volumes of the 'Gardeners' Chronicle' in which accounts have appeared, some by Professor Henslow himself, of the working of these and other educational and social measures.*

* As an exemplification of the methods employed by Prof. Henslow for the gaining of the affections, and amusing and instructing the minds of his humbler parishioners, we subjoin the following interesting sketch of some of the pleasures of a visit to Hitcham about eight years since, which appeared in the 'Literary Gazette' of July 9, 1853, from the able pen of Mr. Lovell Reeve.

“A VILLAGE FLOWER-SHOW.

“IN a quiet corner of rural England dwells a pastor of the Established Church—an eminent teacher of botany—whose educational views, sprung from a mathematical university, have bent with peculiar grace to the influence of his professional pursuits. For him the lilies of the field are as ministering elements of thought and feeling, serving to rear up the minds of his flock in notions of comeliness and order; and to draw lessons from plants and other natural objects, is with him a treasured step towards the development of an observant and godly intellect. Let us see how far his village flower-show of Wednesday last, more pleasurable after its kind than even the glories of Chiswick, confirms the spirit of his teaching.

“The ruling principle of the 'H—— Labourers' and Mechanics' Horticultural Society,' is, that every member should feel his independence as a contributing subscriber. They are of the very poorest class. Few, very few, alas! of the parents are able to read or write. The subscription is *sixpence per annum*, and out of this small fund two annual shows—one of flowers and one of vegetables—are held with great rejoicing in the grounds of the Rectory. Prizes varying from 2s. 6d. to a pinch of white snuff—*i. e.*, peppermint lozenges—are offered by the rector, gentry, and farmers, to the most successful cultivators, and the award of the judges is looked forward to each year with as much competing excitement as the gold and silver Banksian and Knightian medals of the metropolis. There is, however, one important advantage which this Society has over those of London. It gives prizes for Wild Flowers. Here, Flora is not so drugged, and forced, and tricked out with hoops and flounces. Her meretricious adornments of paint and patchwork are unknown in the pastoral village of H——. Her botanical charms are here fresh and uncorrupt. She doesn't linger in heated rooms, and come forth an unblushing jade, all blossom, with her retiring mantle of foliaceous green cropped to the shortest possible dimensions. She breathes the atmosphere of heaven, lurks beneath the tinkling sheep-bell, peeps out modestly from the hedgerows, and is plucked by tiny hands for the sake of the lessons she gives. As the seasons come round, the children of H—— go into the fields to gather wild flowers, and a faithful record is kept and printed of the parish flora. Hard names, such as monocotyledonous and inflo-

“ In 1838 ploughing matches were introduced, and applauded by the labourers ; it might have been supposed by the farmers too ; but with characteristic obstructiveness they for many years continued to throw in the apple of discord, and rendered fair play impossible. Upon this Professor Henslow took higher grounds, and

rescued, are as familiar to them as household words. They are engrafted on the memory by their continual practical illustration. The spelling-book gives them names equally hard and important, such as ple-ni-po-ten-ti-a-ry and ag-grand-ize-ment, but as these things are unfamiliar and have no practical illustration among them, they are forgotten almost as soon as learned. Of Wild Flowers, a prize of 1s. and four of 6d. are offered for the five best nosegays, not exceeding 18 inches by 12, prepared by children between eight and fourteen years of age ; and a prize of 1s. and two of 6d. for similar nosegays from children under eight years of age ; and three prizes of 2s. 6d., 2s. and 1s. 6d. are offered respectively to the children of the parish school who shall answer best some questions about the local wild flowers. There is, however, an important N.B. in the corner of the prospectus. The children who compete for botanical honours must have received a ticket for regularity of attendance at either Day or Sunday School.

“ The day approaches, and great are the preparations at the Rectory. On the broad green lawn, skirted with lofty elm trees,—God’s house in the distance,—are being erected tents and booths, roundabouts and see-saws. The ladies, ever forward in works of charity and kindly encouragement, are preparing all sorts of embellishments—flags of divers patterns, not intended to brave the battle, but only the breeze, and rosettes of economical pseudo-satin, pinked to perfection, to dignify the stewards ; and it is whispered that the servants are preparing a surprise. All that is to be seen in the kitchen at present are the little bags of Congou, milk, and sugar, in solution, brewing in a mash-tub ; and mountains of good brown cake sufficient for a feast of ogres. The day arrives, and the village botanists are sauntering up the long walk with the produce of their rambles. Presently they are buzzing under a group of horse-chestnut trees, making up their nosegays—eighteen inches by twelve—and anon they show them in the exhibition booth, in the quaintest possible stands—from a ginger-beer bottle to a cocked-hat Damon of the time of Watteau, with his arms akimbo, looking as proud of his load as a Linnæan herbalist. Opposite to them are arranged the fuchsias, geraniums, roses, pinks, stocks, pansies, annuals and perennials, nosegays and device nosegays, and at the end the rustics are peeping with astonishment into a polyorama and a stereoscope. On the opposite side of the green is a tent devoted to general curiosities. Eggs of alligator, and eggs of ostrich, eggs of humming-birds, and eggs of some other wonderful birds incubating lilliputian cottages in yolk of shells and moss, casts of Echini in their flinty matrices and Echini in chalk, vegetable ivory, from the nut to its process of turning into pin-cushions and umbrella handles, ammonites and nautili, bright enamelled shells of all kinds, butterflies and scorpions, grasses and sedges, lace bark and chocolate in the pod ; but it is beyond our memory to enumerate the specimens of this instructive museum, all set out and stored away again in one day by the busy Professor in his St. Albans hat of plaited straw. The company has arrived, and probably eight hundred or more, some in fustian and coarse print, some in surtout and gros-de-naples, are assembled on the lawn, the carriage gentry

matured his plans for extending a system which would strike at the root of agricultural slavery, and for which he had been for ten years struggling with but very slender success: this was the allotment system, which from the time of his first proposing it, had met with the fiercest and best organized opposition. To pro-driving up to the house to exchange congratulations with the host and hostess. The servants have brought out their surprises. Upon the booth is seen a triumphant display of loyalty,—‘God save the Queen,’ in daisies of emblematic white upon a laurel background. Over the door is a monster vegetarian, the counterfeit presentment of an agriculturist, spade and fork in hand, built up of laurel leaves, be-buttoned with daisies, and with a face rudely made out of jocund roses. Lastly a richly laurelled throne is brought out, something between a sentry-box and a pulpit, and into this the Rector-Professor mounts to distribute the prizes. The giving of each prize is accompanied with praises and criticism, according as either is needed. The fuchsias are pronounced to be excellent, the pinks not so good. ‘You must improve their cultivation,’ said the Professor, ‘by the next show. In having such jagged edges they look too much like cloves. They look as if they had been jumping through the brambles and had torn their petticoats.’ The failing characteristic was understood in a moment. The wild-flower gatherers now stand round to receive their prizes, and to be asked questions. It was announced that one little girl had added twelve new species to the flora of Hitcham during the past year,—twelve, not brought haphazard with a heap of others, but detected separately in the field as not being in the printed catalogue, and not hitherto known to the University Professor of Botany as being inhabitants of his parish. Plants from the West of England, not before seen by the little botanists, were then shown to them, and the class, family, and genus were told without hesitation; and when asked to what plant known to them they were related, the allied local species was named, though differing in general aspect. The plant was determined alone by its scientific characters. The prizes were awarded, and it did one’s heart good to see the little bob curtsy and intelligent simper that accompanied it. A present of botanical boxes was promised to be given on the morrow. The banquet of tea and cake for the three hundred horticulturists who had taken penny tickets, and a hymn of loyalty and grateful interchange of huzzas between master and servants, concluded the proceedings. The parting adieu is still tinkling gently in our ear.

“But a yet more interesting sight awaited us. On the morrow we visited the parish dame-school. The forms were crowded with children, the girls neat and intelligent, the boys somewhat quaintly clad and drowsy. As the Professor appeared at the door, also a little quaint, in his straw hat, with a rough hoe for a walking-stick, the pinafores botanists, who seemed to congregate by instinct, stood up to receive him. At one end of the room was a cupboard, overlooked by a print of Joseph cast by his brethren into the pit, containing the parish herbarium. It consisted of dried specimens of the flora of Hitcham, neatly arranged and named, and outside on a board hung the printed catalogue of reference. Opposite to it was a large A B C table and some views of the Crystal Palace. At the other end of the room was the vivarium or collection of living specimens. Each plant

vide the labourer with the means of improving his condition, and secure to him as an irrefragable right, what alone offered a prospect of keeping him from the workhouse when unemployed by the farmer, and from the beershop when disposed to be idle, was an object worth every effort on the part of the rector; and in 1849, by dint of his indomitable moral courage and determination, he succeeded in establishing no fewer than fifty quarter-acre allotments in the parish. For several years the battle raged, but with the aid of one or two staunch supporters—honourable exceptions to the mass—he overcame all difficulties, and finally almost tripled the number of allotments. Throughout the whole of this agitating period Professor Henslow preserved not only a calm, but a conciliatory bearing: he announced himself from the first as a champion of the rights of the poor, sought no quarter himself, but gave it liberally to all the vanquished; he printed and circulated

was contained in a separate phial of water, and two or three hundred or more, all fully labelled, were arranged along the wall in wooden shelves drilled for their reception. The prizes awarded to the most successful field botanists were now brought out for distribution. They were of three classes—botanical boxes, pocket lenses, and cases of forceps. The little villagers received their philosophical instruments with a shrewd appreciation of the use of them, and brought them to bear on a dissection of the products of the day with the dexterity of a Hooker or a Lindley. The forceps was lifted to separate the sepals and petals, the lens to examine the number of pistils and stamens, and class, order, and genus were determined by the competing botanists in a moment. ‘They beat my Cambridge boys,’ said the Professor. ‘We don’t trouble ourselves here about the Artificial system of botany; we jump smack to the Natural.’ One little girl had detected a species of reed grass new to her. It was new, as occurring in this locality, to the Professor. It was new even to his own private herbarium, and rare in all England. A liberal pinch of white snuff from Pandora’s box was the welcome reward. The girls were now examined as to the general characters of plants. A specimen was held up and systematically pulled to pieces, and the questions put were promptly answered in the course of the dissection. All we can ourselves remember is a lifting of the forceps, a quizzing through lenses, a general consultation and whispering, and the simultaneous echo now and then of such words as ‘tetradynamous,’ ‘hypogynous,’ ‘polypetalous,’ ‘syngenesious,’ and the like, learned out of a printed formula, which, owing to the assistance of the bountiful goddess hereinbefore mentioned, had proved much easier to them than the multiplication table. ‘They beat my Cambridge boys hollow,’ again remarked the Professor, with a smile. In conclusion, all knelt down on the clean brick floor, to repeat a short prayer to the gracious Giver of plants that open out spring lessons for intelligent minds, and we went out thoroughly impressed with the importance of nature-teaching, even in this sequestered pastoral spot. We would have given the world at that moment for some claim to a share in the blessing that followed the Reverend Professor home to the Rectory.”

one sharp rebuke addressed to the farmers, which informed them of his intention of abiding by his own resolves, and declining their dictation. The success of the allotments is now complete, and the Hitcham allottees have on several occasions distanced all competitors in the excellence of their produce.

“ We cannot here do more than allude to the various well-organized methods by which Professor Henslow gradually raised the condition of the people committed to his charge, and which, without one exception, were flourishing at the period of his decease. Of these the ‘Recreation Fund’ has naturally been the most popular; it originated in his suppression of the annual tithe dinner given by the rector to the farmers in one of the public-houses, and which was always a scene of disgraceful drunkenness. In 1849 he announced his determination to withhold the money for this purpose, and to employ it in giving an excursion in which the best-conducted of his parishioners should join: short excursions in the neighbourhood excited a desire for more distant ones, and by means of a small subscription amongst themselves, aided by larger ones from the rector’s family and some well-wishers to his plans, journeys to Ipswich, Norwich, Cambridge, the Exhibition of 1851, Kew, Harwich, and Felixstow, were organized and carried out at the expense of a few shillings per head. On these occasions Professor Henslow often printed and circulated plans of the route, with illustrations that should serve for reminiscences of the chief objects worth seeing: he arranged with the railway directors for cheap trains, and with public and private individuals for admission to interesting places; and most generously were his exertions everywhere seconded by all parties. The plans all arranged, time-tables opened, and, with tickets in their hats, nearly two hundred villagers would assemble at dawn to enjoy throughout the day the simple and instructive discourse of one whose engaging voice never failed to draw a crowd of hearers of all ages. It is a well-authenticated fact, that, though the rustics were on all such occasions unfettered in action throughout the day, and often thirsty and exposed to temptation, there never occurred an incident of which any could be ashamed; at the termination of the day, or perhaps deep in the summer night, they would return orderly and happy to their homes, without an absentee. After one of these trips (that to Cambridge), the farmers of the parish, unable to withhold any longer some expression of admiration, united in presenting him with a silver cup.

“ We need not further refer to the village festivals and horticult-

tural shows, which have often been described, nor to the prizes given for garden produce, honey, nosegays of wild flowers, and good cultivation, together with the simultaneous amusements provided for all ages in tents on the rectory lawn, the addresses, *lectures*, parting counsels of wisdom, and chorus of 'God save the Queen.' Nor is this the place to go into the details of the 'Wife's Society,' the 'Coal Club,' the 'Medical Club,' 'Children's Clothing Club,' 'Loan Fund,' and a number of other successful expedients to encourage the villagers in practices of mutual charity, and, at the same time, habits of self-dependence. All these and much more, have been often detailed in the local papers, and in none better than the Suffolk Chronicle.

"To the neighbouring towns of Bildeston, Hadleigh, Ipswich, Bury St. Edmunds, and Sudbury, Professor Henslow most liberally extended his services in diffusing knowledge to all classes, and by every means in his power. In London he lectured but once, and then to the junior members of the Royal Family; all other invitations he refused, on the ground that there was no excuse for scientific destitution in the metropolis, and that he must economise his resources for his own neighbourhood and university. When invited by H.R.H. the Prince Consort to give a short course of lectures at Buckingham Palace, he gladly did so; with characteristic modesty attributing the selection of himself to a desire on the part of the Prince to recognize his efforts in school teaching (which would be of the greatest service towards extending his usefulness), rather than as marking his appreciation of Professor Henslow's position as a man of science. These lectures were delivered *vivâ voce*; they were in all respects identical with those he was in the habit of giving to his little Hitcham scholars; and the same simple language and engaging demeanour that had proved irresistible in the village, won over his Royal audience to fixed attention and eager desire for instruction.

"With the exception of Cambridge, no town owes so deep a debt of gratitude to Professor Henslow as Ipswich, whose unique museum was planned and arranged by him, and made the model of what a local museum should be in a scientific, educational, and popular point of view. He so grouped all natural objects that enough was exhibited to teach, but not so much as to confuse; and the ingenuity, judgment, and science with which he did this for all branches of knowledge, have never been even rivalled. To a certain extent the same services have been rendered to the Cambridge Botanical Museum, where, however, his efforts

were frustrated for want of space : at the Royal Gardens, Kew, he has been more successful, and the museums there owe much of their admirable method of mounting, illustrating, and ticketing, together with many valuable objects, to his unequalled talents for such work. His practice throughout life was to give the best of everything to public museums, and to retain duplicates only for himself.

“ The Great Exhibition of 1851 deeply interested him, and there were few departments of it with the contents of which he was not perfectly familiar. To the succeeding Exhibition at Paris he communicated a most beautiful series of Carpological illustrations, which excited the enthusiasm of the Paris botanists, and of which a duplicate set is now in the South Kensington Museum ; where also are sold his admirable botanical diagrams for schools, with a little guide to their use, and his method of teaching botany in schools.

“ For a considerable period of his life he worked with zeal at British antiquities, in which he became learned and expert, himself opening several tumuli, the contents of which he described in two tracts with illustrations. The fragments of glass, pottery, and Samian ware from these and other quarters, some of very large size, were all neatly and accurately restored by his own hands, and the best presented to the museum of Colchester.

“ Every room of his large rectory, from hall to attic, presented a marvellous assemblage of instructive objects of interest, beautifully mounted with descriptive labels, to attempt conveying any idea of which would be utterly hopeless ; besides botanical and zoological specimens, economic, physiological and structural, without end, there were series illustrating many important arts and manufactures of savages and civilised beings, ancient and modern : linen, cotton, shoes, hats, candles, glass, pottery, silk, &c., all beautifully packed in boxes, and ready for use when needed. Fossils, antiquities, models of ships and machines, orreries, microscopes, weapons, crystallographical series, and philosophical apparatus of all kinds ; besides diagrams, drawings, and classified woodcuts, of which he had literally thousands, mounted and instructively arranged in classes ; and all independent of his library and excellent British entomological, conchological, and tertiary fossil collections. Let it not be supposed that these were the miscellaneous hoardings of a mere collector ; there was not one specimen that had not attached to it its history, nor that was not obtained and mounted for a purpose, and that was not in use at one or other of his frequent lectures, or placed at the service of his scientific friends.

“ Tertiary geology and the recent changes of the earth's surface

before and since man's appearance, had, perhaps, a more absorbing interest for Professor Henslow than any other subject. Few persons more deeply studied and more boldly preached the Bible, or more staunchly upheld the doctrines of the Church of England; but he ever maintained the necessity of appealing to the spirit rather than to the letter of the written Word, in all cases where the established facts of science appeared to contradict the text of Scripture. In spiritual matters he avowed the total insufficiency of human reason unaided by revelation; but having witnessed many changes of theological opinion brought about by progressive discoveries in history and science, he was very averse to speculative reasoning where these were not in apparent harmony with revelation.

“His charity was nowhere more conspicuous than in his intercourse with those who differed widely, and often publicly, from himself in religious opinion. He never sought to gloss over these differences, nor did he allow of any misconceptions with regard to their true nature: but he never permitted them to influence in the smallest degree his conduct, or to diminish his admiration for what was honest and good, wherever he found it. Hence he discussed such polemical questions as the age of the globe, the origin of species, &c., with such ingenuous forbearance, that inquirers of all denominations and professions turned to him for a calm and unprejudiced judgment.

“As may be supposed, the flint implements in the drift deeply occupied his attention: on first hearing of them (their human origin he never doubted), he was disposed to be wholly incredulous as to their antiquity, and published his opinion on the subject: this was no wonder, considering how many man's nests of the kind he had seen exposed, and himself aided in exposing. Nothing hampered by his avowed scepticism, he, with characteristic devotion to truth, earnestly took up the subject, twice visited Hoxne, where he had excavations made which resulted in a modification of his first view; he then visited the pits at Amiens and Abbeville in the autumn of last year, studied the localities and country around, the museums and collections in the neighbourhood, and returned with his views still further modified though not wholly altered. Up to the time of his last illness he was busy on this subject, comparing his observations with those of others, and studying the results, which he was preparing to lay before the Cambridge Philosophical Society. Of what his final conclusion was, no record has been published; but we believe that he had convinced himself

that the flint implements belong to a period long antecedent to that usually attributed to man's existence on the earth, though by no means so distant as some geologists suppose.

“ But it would be difficult to point out any branch of science in which Professor Henslow did not take an active interest; he attended the first meeting of the British Association, and was ever afterwards a staunch supporter, and frequently an officer of this body; he was one of the first examiners in the University of London, and till his death a distinguished member of its council; he actively aided the Society for the Diffusion of Useful Knowledge, the Ray Society, and the Palæontographical Society, and was a most liberal contributor to the various charities and funds for the relief of the needy members of his own profession and naturalists in general. To poor authors, especially, he was a most generous subscriber, nor was he ever appealed to in vain in any cause the justice and expediency of which were duly authenticated.

“ At several periods he took a most important part in public politics, being an active member of a party who pledged themselves to suppress that system of bribery for which the town of Cambridge was long so justly infamous; and though few of his University and scientific friends sympathised with him on these occasions, his conduct was so typical of his singleness of purpose, firmness of character, and abhorrence of foul play, that this portion of his career cannot be overlooked even in a brief review of his life.

“ On one occasion in particular, when no one else of sufficient position and character would come forward, he had the moral courage to brave, not only the public odium (for which in a just cause he never cared much), but the disapprobation of many of his most intimate friends, and offer himself as the nominal prosecutor in a case of gross corruption. In doing this he was actuated by a feeling of duty to his country, and beyond it he did not interfere; neither attending the trials or committees, nor subscribing to any of the proceedings. The amount of abuse he received may be estimated by the fact, that upwards of a quarter of a century afterwards he smilingly pointed out to a friend the words ‘ Henslow, common informer,’ on the walls in Cambridge, where they are still legible. His services were, however, deeply appreciated at the time, for he received three handsome testimonials, one from the town of Cambridge, another from the Town Committee for the suppression of corruption, and the third from a committee of noblemen and gentlemen; all alike testify to the perfect disinterested-

ness, moral courage, and consummate ability with which Professor Henslow conducted the duties he volunteered for. It has been erroneously stated that he received the living of Hitcham as a reward for these services. Such, however, was far from the case; he was made aware, indeed, that he was considered entitled to government patronage, but, with conscientious disinterestedness, he declined to avail himself of the offer. On the death of the previous rector of Hitcham he was recommended by the Bishop of Ely (formerly tutor to Lord Melbourne) as being the man who, in that prelate's opinion, was best calculated by his ability, activity, and common sense, to reform that populous, remote and woefully neglected parish, where the duties of squire, magistrate and rector must all fall upon the latter.

“ Amongst the most remarkable instances of a direct benefit conferred upon agriculture through scientific knowledge, was his discovery of the use of the phosphate nodules which abound in the tertiary formations of the Eastern counties. On the discovery of the nature and origin of those petrified animal remains, their value to the farmer was instantly apparent to Professor Henslow, who at once gave his discovery the widest circulation in the local papers, without reservation of any kind; claiming no credit, no reward, no consideration even as the discoverer. This was indeed heaping coals of fire on the farmers' heads, to whom this discovery continues to be a source of incalculable wealth, large areas of Norfolk, Suffolk, and other counties, being now honeycombed with phosphate pits; yet up to the day of Professor Henslow's death, no acknowledgment even was vouchsafed of his services. In the same liberal spirit he printed and circulated his volume of letters to the farmers of Suffolk, which pointed out and stimulated them to use methods which have largely increased the products of their holdings.

“ Though the professional career of Professor Henslow as the spiritual guide of his parishioners is a subject unsuited to our columns, yet it is right to state that his duties as pastor superseded all others in his estimation; and though they were eclipsed in public opinion by his more conspicuous labours, and though he had the greatest aversion to a parade of religion, he was ever assiduous in spiritual duties—so much so, that for fifteen years he was not absent from Hitcham for a single Sunday.

“ But want of space forbids our going further into the philanthropic or scientific career of this most amiable, learned, and excellent man; a volume might be filled with the incidents of his

ever-busy and well-spent life, during which he was incessantly occupied for others rather than for himself; and with anecdotes of his noble qualities of head and heart. We can only allude to his efforts, not completely successful until near the close of his life, to establish in Cambridge the scientific tripos and degrees in science, and to develop the University Herbarium and Botanical Garden, with their Library and Museum, to which he for 30 years very largely contributed from his private means, and to which he gave all his own botanical collections. To the University his loss is as disastrous as it is irreparable; whether as a member conspicuous for his varied accomplishments and genial nature, or as a teacher, and most especially as not only the best, but the only man altogether qualified to direct the scientific, educational, and practical arrangement of its new museum.

“During the last few years of Professor Henslow’s life his health had become seriously impaired; incessant mental and manual labour, habitually protracted beyond midnight, and the want of proportionate daily exercise, gradually undermined his once robust constitution; though he was always abstemious and temperate in every respect. About five years ago he complained of considerable derangement of lungs or heart, which was attributed by his medical attendants to defective digestion. In March of the present year, though feeling far from well, he left home to pay some visits in the south of England, where he caught a violent cold, which was followed by bronchitis and congestion of the lungs and liver, which alarmingly aggravated his heart symptoms. He returned to Hitcham on the 24th, when he rapidly grew worse, and was soon confined to a bed of protracted suffering, which he never quitted till his death on the 16th of May.

“Professor Henslow desired to be interred in the churchyard at Hitcham, and that his funeral should be of the simplest description, and none but his parishioners employed; his wishes were strictly attended to, but a considerable concourse of strangers found their way to that remote village, and, together with a deputation from the town and corporation of Ipswich, paid their unobtrusive tribute to the memory of one whose rule of life was the motto of his family—‘*Quod videris esto.*’”

Thomas Hoblyn, Esq., F.R.S. and M.R.I.A., was late Chief Clerk in Her Majesty’s Treasury. He died on the 6th of August, 1860, in his 83rd year, having been a Fellow of the Linnean Society since the 4th of March, 1823.

Edward F. Kelaart, M.D., F.G.S., was a native of Ceylon, of what

is there called "burgher" parentage; that is to say, descended from the early Dutch colonists, a race that of late years, under the liberal government of Ceylon, has produced many individuals of merit in the professions of law and medicine. His father was employed in the military medical department, and the son was thence afforded favourable opportunities of acquiring the rudiments of science. In these studies he was much encouraged by the late Henry Marshall, Deputy Inspector-General of Hospitals, and from whose precepts and example he derived the habits of study and arrangement by which he was distinguished. Early in life he visited England to prosecute the study of medicine and surgery, and having obtained his diploma, he was, in 1841, appointed Staff Assistant Surgeon in Her Majesty's Forces. Being stationed in this capacity at Gibraltar, he diligently collected and arranged the plants of that singular promontory. The results of these labours appeared in 1846 under the title of "*Flora Calpensis, or Contributions to the Botany and Topography of Gibraltar*;" a small and unpretending, but highly meritorious and useful work.

Dr. Kelaart subsequently returned to Ceylon, and for several years busied himself with the Fauna of that magnificent island. He also published an extended catalogue of its productions, which forms a valuable addition to the knowledge of its natural history.

His impaired health constrained him on two occasions to return to England, and on his last return to Ceylon in 1856, he was engaged by the late Governor Sir Henry Ward in observing and investigating the Natural History of the Pearl Oyster, the fishery of which is of considerable importance in the revenue of the island. Some of the results of this investigation have appeared in an 'Introductory Report on the Natural History of the Pearl Oyster of Ceylon,' published at Trincomalee in 1857.

He had also previously published at Columbo, in 1852-4, a '*Prodromus Faunæ Zeylanicæ*,' of which he presented the first, and the first part of the second volume, to our Library.

Being subsequently recalled to England, he died suddenly of disease of the heart, during the passage, on the 31st August, 1860, in his 42nd year.

Frederick Perkins, Esq., F.G.S. & H.S., the head of the eminent firm of brewers in Southwark, died on the 10th of October, 1860, in his 81st year, at Chipstead Place, Kent. He was elected a Fellow of the Society on the 13th of March, 1816.

Francis Plomley, M.D., was a physician of considerable repute at Maidstone, where he died, after a long illness, on the 9th of

January, 1860, in the 55th year of his age ; having been a Fellow of the Linnean Society since the 4th of March, 1845.

Dr. Plomley began life as a general practitioner at Lydd, on Romney Marsh, but on his becoming an Extra-Licentiate of the Royal College of Physicians in 1846, he removed to Maidstone. In 1849 he much distinguished himself by his courage and self-devotion in the treatment of a fearful epidemic which broke out among the Irish hop-pickers congregated at East Farleigh, in the neighbourhood of Maidstone. Regardless of danger and fatigue, he devoted himself for sixteen days and nights, almost without intermission, to his painful task, in conjunction with Mr. Sedgwick, Mr. Kennett, the Union Surgeon, and the then Incumbent of the parish, the Rev. Archdeacon Wilberforce. In 1850, Dr. Plomley was appointed Physician to the West Kent Infirmary.

Notwithstanding his professional occupations, he always found time to devote considerable attention to natural history, and especially to ornithology ; and during his residence on Romney Marsh he made a valuable collection of Kentish Birds, comprising not less than 516 specimens, all preserved and set up by himself. This interesting collection, which was always liberally open to the public, he eventually presented to the Dover Museum, where it is shown as the "Plomley Collection." Dr. Plomley's published works are of no great importance, consisting chiefly of lectures addressed to the Weald of Kent Farmers' club in the years 1849-51, on subjects of natural history, interesting to the agriculturist. They are :—

1. A Lecture on the Structure, Functions, and Chemistry of Plants.
2. Observations on the Laws which regulate the Growth and Cultivation of Grain and Root Crops.
3. On the Blights of the British Farm, arising from Parasitic Fungi.
4. On Hop-Blights ; including the Natural History of the Hop-Fly and its Enemies.

These praiseworthy attempts to enlighten his neighbours on scientific subjects very necessary for them to be acquainted with, are all highly creditable to Dr. Plomley, and the last Essay more especially appears to contain some interesting original observations.

Francis George Probart, M.D., was a physician of considerable eminence at Bury St. Edmunds, in which town he had long occupied a very prominent position, and was much and deservedly

respected by all classes. He died suddenly on the 25th of April 1861, aged 79, having been a Fellow of the Linnean Society for 33 years.

Edward Rigby, M.D., one of the most eminent among London obstetrical physicians, was born at Norwich on the 1st of August, 1804, the son of Dr. Edward Rigby, of that town, who attained great celebrity by a valuable "Essay on Uterine Hemorrhage" and other works.

Dr. Rigby was one of twins, and it is a curious circumstance, often adverted to by himself, that he was one of six children born at two births, his mother at a subsequent confinement having produced four.

His education was commenced at the Grammar School of Norwich, then directed by the Rev. Dr. Valpy, and among his school-fellows were Sir James Brooke and Sir Archdale Wilson. He was afterwards placed with the Rev. James Layton, at Catfield in Norfolk, where, however, he did not remain more than two years, and at the age of 17 he attended the practice of the Norfolk and Norwich Hospital, and in the same year had the misfortune to lose his father. He afterwards proceeded to Edinburgh, where he graduated, receiving his diploma on his 21st birthday. Subsequently Dr. Rigby pursued the study of his profession in Dublin, Berlin, and Heidelberg, where, from the kindness of Professor Nægeli, he enjoyed ample opportunities for improving his knowledge of obstetric medicine. Professor Nægeli's instructions and scientific knowledge were so highly valued by his pupil, that Dr. Rigby undertook a translation of the Professor's pamphlet on "The Mechanism of Parturition," which was published in London in 1829.

In the same year he became a house-pupil at the Lying-in Hospital in the York Road, to which Institution he was afterwards first junior and then senior physician. In 1831 he passed the College of Physicians and commenced practice in London, where his professional abilities at once placed him in a prominent position. As a teacher, he began as Lecturer on Midwifery at St. Thomas's Hospital, but in 1838 he was appointed to the Midwifery Chair at St. Bartholomew's, where he continued to lecture for ten years, when the pressure of his professional engagements compelled him to retire. For nineteen years he occupied the position of Examiner in Midwifery in the University of London, vacating it only a few months before his death, which took place on the 27th of December, 1860, as a loving biographer in the 'Medical Times' remarks, "scarcely full of years, but full of honours."

William Somerville, M.D., died on the 25th of June, 1860, at Florence, in his 92nd year, being thus one of two nonagenarians who have departed from among the Fellows of the Linnean Society in the past year.

He was formerly one of the principal Inspectors of the Army Medical Board, and Physician to the Royal Hospital, Chelsea.

James Forbes Young, M.D., was born in April, 1796. He was a magistrate and deputy lieutenant for Surrey, and an eminent medical practitioner in Lambeth, having succeeded his father in practice in the year 1836. His early education was conducted at the Charter House, and he afterwards became a student of medicine at Guy's Hospital, whence he proceeded to Edinburgh, where he graduated in 1817. His unwearied industry and talents, combined with his amicable and conciliatory disposition and deportment, naturally led to a great extension of the practice he had inherited from his father, and justly secured him the love and esteem of all who had occasion to consult him, or came within the sphere of his friendship. Like many others in his profession, he loved natural science, and was distinguished by his ardent zeal in the cultivation of botany and geology. Early in life he began the formation of an *herbarium*, which is said to be rich in British plants collected and arranged by himself. He also devoted much time and attention to, and was very successful in the cultivation of ferns, of which plants he had perhaps one of the choicest collections in the neighbourhood of London. In Geology his attention appears to have been chiefly devoted to the study and collection of chalk fossils, of which he possessed an extensive and fine series. In addition to these professional and scientific pursuits he was no mean antiquarian, and had made a considerable collection of prints relating chiefly either to history or topography, and he had himself profusely illustrated editions of "Grainger's Biographical History of England," "Pennant's London," and the "History of Lambeth and Charter House,"—his own "*alma mater*," besides other works of a more miscellaneous character.

Two years before his death his useful and laborious career was interrupted by an attack of paralysis, from which he never wholly recovered, and, gradually declining, he died on the 30th of June, 1860, and was buried in Lambeth churchyard, which also contains the tombs of the "three Tradescants, grandsire, father and son," restored some years ago under Dr. Young's superintendence.

In our list of FOREIGN MEMBERS we have to lament the loss of one of the oldest and most famous of European Zoologists, the

venerated M. Duméril, who died on the 14th of August, 1860, after a short illness, at the advanced age of 86, universally honoured and beloved.

Andre-Marie-Constant Duméril, Member of the Institute and Commander in the Legion of Honour, was born at Amiens in the year 1774. At an early age he devoted himself to the study of Medicine, and so soon distinguished himself, that in 1793, when only 19, he was appointed Prévôt d'Anatomie at Rouen. In 1798 he was admitted to the degree of Doctor of Medicine in the University of Paris, and was nominated Chef des Travaux Anatomiques in that Capital, an office for which he had competed successfully with Dupuytren. In 1801 he was raised to the chair of Anatomy at the Faculty of Medicine, which in 1822 he resigned for that of Physiology, to be in turn exchanged, in 1830, for that of internal Pathology, which he held till his death. In the early part of his career he appears to have been also actively engaged in the practice of Medicine, and in 1804 was appointed by the Emperor Napoleon, in company with M. Desgenettes, on a mission to study the yellow fever in the South of Spain,—a dangerous duty, to which he devoted himself with the zeal and energy which he displayed on all occasions and on all subjects.

But notwithstanding these professional occupations, M. Duméril's attention was from the first principally directed towards zoological science, to various departments of which his chief works alone belong.

In 1800, under the direction of Cuvier, he assisted in the editing of the first two volumes of the 'Leçons d'Anatomie Comparée' of that great anatomist, who never failed on all occasions to acknowledge the assistance he had derived from his able and industrious coadjutor; by whom also he was succeeded in the chair of Natural History in the École Centrale of the Panthéon*.

In 1802 he was deputed by M. de Lacépède to deliver the lectures on Herpetology and Ichthyology at the Jardin des Plantes, a mission which M. Duméril continued to fulfil for more than fifty years, at first as the substitute for M. de Lacépède, and afterwards as titular Professor of those subjects. To his zeal and industry in this office, not only is the Museum indebted for the creation both of the best collection of objects belonging to Herpetology

* In a notice of M. Duméril's works, it should not be omitted that he was perhaps the first to perceive the analogy of structure which exists between the vertebræ and the bones of the cranium; a theory which for the last forty years has exercised the ingenuity of so many.

ever brought together, and of living specimens in the Menagerie of Reptiles, but the scientific world at large owes the production of the great work on Herpetology, the 'General History of Reptilia,' which, at first in conjunction with his friend and pupil the late lamented M. Bibron, was in progress for a period of twenty years.

The scientific labours of M. Duméril, continued through an almost unparalleled length of years with unabated vigour and success, have crowned his name with universal fame, and his deserts have been acknowledged in the various honours bestowed upon him. In 1816 he was chosen a member of the Academy of Sciences (Section of Anatomy) in place of M. Tenon, and received the decoration of the Legion of Honour in 1837, in which illustrious Corps he was raised to the rank of Commander a short time before his death. His honoured name was added to the list of our Foreign Members in 1854.

In his zoological works he displayed great descriptive and analytic powers, delighting in precise and lucid definitions, and in attention to systematic classification. At the same time, however, like Buffon and Pallas, Reaumur and De Geer, and many others of the most illustrious zoologists, he devoted much time to the study of the habits of animals, the record of which adds so much not only to the scientific value, but to the popularity and interest of zoological works. The subjoined list of M. Duméril's principal works, though I fear very imperfect, will still serve, better than anything else, to show how his valuable labours were continued and varied during a longer life than falls to the lot of most, and continued moreover, it may be said, with increasing value and importance to the last. His first work left the press in 1797, when he was but 23; and his last, a quarto of 1336 pages, appeared almost simultaneously with his decease at the patriarchal age of 86.

Few can show such a career of usefulness, and of no one can it be more truly said that in its course he never made an enemy. Distinguished as M. Duméril was in science, in moral worth he was equally eminent. Devoted in friendship, amiable towards his colleagues, paternal towards his pupils, benevolent towards all men, void of jealousy or envy towards rivals,—his praise was always ready where it could be bestowed, and his encouragement wherever it was needed.

The following are the principal works for which science is indebted to M. Duméril:—

1. Dissertation sur l'Organe de l'Odorat, et sur son existence. dans les Insectes. 1797.

2. *Traité élémentaire de l'Histoire naturelle.* 1804; 2nd ed. 1830.
3. *Zoologie Analytique, ou Méthode naturelle de Classification des Animaux.* 1806.
4. *Mémoires de Zoologie et d'Anatomie Comparée.* 1807.
5. *Sur le developpement de la Chaleur dans les œufs des Serpens (Mém. de l'Acad.).*
6. *Dissertation sur les Poissons qui se rapprochent le plus des Animaux sans Vertèbres.* 1812.
7. *Dissertation sur la Famille des Poissons Cyclostomes, pour démontrer leurs rapports avec les Animaux sans Vertèbres.* 1812.
8. *Considérations générales sur la Classe des Insectes.* 1823.
9. *Erpétologie générale, ou Histoire naturelle des Reptiles.* 1834–54 (in conjunction with his friend and disciple, M. Bibron).
10. *Prodrome de la Classification des Reptiles Ophidiens.* 1853.
11. *Ichthyologie Analytique; ou Essai d'une Classification naturelle des Poissons.* 1856.
12. *Entomologie Analytique.* 1860.

The Secretary also announced that twenty-three Fellows, one Foreign Member, and one Associate, had been elected since the last Anniversary.

At the Election which subsequently took place, George Bentham, Esq., was elected President, W. W. Saunders, Esq., Treasurer; and George Busk, Esq. and Frederick Currey, Esq., Secretaries. The following five Fellows were elected into the Council, in the room of others going out:—viz., M. P. Edgeworth, Esq., John Miers, Esq., Daniel Oliver, Esq., Lovell Reeve, Esq., and P. L. Sclater, Esq.

It was moved by Dr. Boott, and seconded by Mr. Saunders, that the best thanks of the Society be given to Professor Bell, for his invaluable services to the Society during the eight years he has occupied the President's chair. That the Society gratefully acknowledges the unvarying courtesy and kindness with which he has discharged the duties of the office, and fully recognizes the zealous interest he has taken in the welfare of the Society and in the promotion of its objects; willingly attributing to his efforts much of its present prosperity and increased usefulness, as displayed in the large number of new Fellows, the value and greater frequency of its publications, and the satisfactory state of its finances.

It was moved by Mr. Bentham, and seconded by Mr. Saunders, that the thanks of the Society be given to Dr. Boott, on his retirement from the office of Treasurer, with an expression of the Society's deep regret on losing his valuable services in that capacity.

Mr. Bennett, on the part of the auditors of the Treasurer's accounts, read the balance sheet, by which it appeared that the total receipts during the past year, including a balance of £415 14s. 3*d.* carried from the preceding year, amounted to £1,566 13s. 1*d.*; and that the total expenditure during the same period amounted to £1,121 10s. 8*d.*; leaving a balance in the hands of the bankers of £445 2s. 5*d.*

June 6th, 1861.

George Bentham, Esq., President, in the Chair.

The President nominated Thomas Bell, Esq., J. J. Bennett, Esq., J. D. Hooker, Esq., M. D., and W. W. Saunders, Esq., Vice-Presidents for the ensuing year.

Read, first, "Notes on *Caryophylleæ*, *Portulacææ*, and some allied Orders;" by George Bentham, Esq., Pres. L.S. (See "Botanical Proceedings," vol. vi.)

Read, secondly, "Further Remarks on Scansile Appendages to the Feet of Insects;" by Tuffen West, Esq., F.L.S. (See "Transactions," vol. xxiii., Part 2.)

Read, thirdly, "Catalogue of *Hymenopterous Insects* collected by A. R. Wallace, Esq., in Ceram, Celebes, Ternate, and Gilolo;" by Frederick Smith, Esq., Assistant in the Zoological Department, British Museum. Communicated by W. W. Saunders, Esq., V.P.L.S. (See "Zoological Proceedings," vol. vi.)

June 20th, 1861.

George Bentham, Esq., President, in the Chair.

Senjee Pulney Andy, Esq., M.D., John Thomas Head Cotsell, Esq., and Peter Jones, Esq., were elected Fellows.

Professor Huxley, F.R. & L.S. exhibited a specimen of *Hyalomema mirabilis*, the property of Mr. Veitch (to whom it had been sent by his son from Japan), and made some explanatory observations.

General Sir John Hearsey, C.B., F.L.S., exhibited a collection of new or rare insects made by himself in India: also drawings illustrative of the transformations of Indian insects.

Sir Charles Bunbury, Bart., F.L.S., exhibited a flowering specimen of *Æsculus indica*, from Barton Hall, Suffolk. The tree raised from seed in 1851.

Dr. Carpenter, F.R. & L.S., exhibited the cocoons of the Tusseh Silk-moth of the Deccan (*Saturnia Mytilla*), from which silk is extensively manufactured at Wurrungul, in the Nizam's dominions.

Read, first, "Notes on *Malvaceæ* and *Sterculiaceæ*;" by George Bentham, Esq., Pres. L.S. (See "Botanical Proceedings," vol. vi.)

Read, secondly, "On *Fissicalyx* and *Prioria*, two recently published genera of *Leguminosæ*;" by the same. (See "Transactions," vol. xxiii. Part 2.)

Read, thirdly, "On the Discovery of *Carex Ericetorum*, Poll., as a native of Britain;" by C. C. Babington, Esq., M.A., F.R.S. & L.S., Prof. Bot. Univ. Camb. (See "Botanical Proceedings," vol. vi.)

Read, fourthly, "On three Oaks from Palestine;" by J. D. Hooker, Esq., M.D., F.R.S. & L.S. (See "Transactions," vol. xxiii. Part 2.)

Read, fifthly, "On some species of Oak from North China, collected by W. F. Daniell, Esq., M.D., F.L.S.;" by William Carruthers, Esq., F.L.S. (See "Botanical Proceedings," vol. vi.)

Read, sixthly, "Upon the Nerve proceeding to the Vesicles at the base of the Halteres; and on the subcostal Nervure on the Wings of Insects;" by J. B. Hicks, Esq., M.D., F.L.S. (See "Transactions," vol. xxiii. Part 2.)

Receipts and Payments of the Linnæan Society from May 1, 1860, to April 30, 1861.

	£	s.	d.
Balance in the hands of the Bankers at last audit	415	14	3
Admission Fees	120	0	0
Compositions	330	0	0
Annual Contributions of £2 2s.	54	12	0
Do. do. of £3	519	0	0
Penalty of Bond (J. F. South, Esq.)	20	0	0
Transactions and Journal sold	85	11	1
Dividends on Consols	8	12	6
Contribution to Removal Fund	5	0	0
Donation from Daniel Hanbury, Esq. (Cost of plate in Linnæan Transactions)	8	3	3
	<u>£1566</u>	<u>13</u>	<u>1</u>

	£	s.	d.
Insurance	15	2	0
Repairs and Furniture	11	11	0
Coals, Gas, Tea, Postage, &c.	96	10	9
Salaries	170	0	0
Printing, Engraving, &c.	655	1	0
Books purchased	26	2	4
Bookbinding and Stationery	27	3	10
Bond paid off, with Interest	108	0	0
Commission	11	19	9
Balance in the hands of the Bankers	445	2	5
	<u>£1566</u>	<u>13</u>	<u>1</u>

F. BOOTT, *Treasurer.*

The foregoing Accounts have been examined, and the Balance in hand found to be correctly stated at £445 2s. 5d.

MAY 20, 1861.
THOMAS BELL, *President.*
JOHN J. BENNETT, V.P.
JOHN HOGG.

W. WILSON SAUNDERS, V.P.
J. S. BOWERBANK.
GEORGE BUSK.

PROCEEDINGS

OF THE

LINNEAN SOCIETY OF LONDON.

November 7th, 1861.

George Bentham, Esq., President, in the Chair.

Samuel Ainsworth, Esq., was elected a Fellow.

A Marble Bust of the late Robert Brown, Esq., Pres. L.S., by Mr. Slater, was presented by the President, on the part of the following Members; to whom the special Thanks of the Society were directed to be offered for this very acceptable Donation:—

W. Addison, M.D.	George Busk, Esq., Sec. L.S.
C. C. Babington, Esq.	W. B. Carpenter, M.D.
Rev. C. Babington.	Henry Christy, Esq.
Thomas Bell, Esq., V.P.	Charles Cogswell, M.D.
George Bennett, M.D.	Hugh Cuming, Esq.
J. J. Bennett, Esq., V.P.	C. G. B. Daubeny, M.D.
George Bentham, Esq., Pres. L.S.	M. Pakenham Edgeworth, Esq.
H. G. Bohn, Esq.	Hugh Falconer, M.D.
Francis Boott, M.D.	W. H. Fitton, M.D.
J. S. Bowerbank, Esq.	John Forster, Esq.
G. B. Buckton, Esq.	R. E. Grant, M.D.
W. M. Buckton, Esq.	Daniel Hanbury, Esq.

J. A. Hankey, Esq.	Joseph Milligan, Esq.
Sir J. B. Hearsey, K.C.B.	T. N. R. Morson, Esq.
Rev. J. S. Henslow.	Sir R. I. Murchison.
Sir W. J. Hooker.	Algernon Peckover, Esq.
J. D. Hooker, M.D., V.P.	Charles Ratchiff, Esq.
Robert Hudson, Esq.	F. C. S. Roper, Esq.
T. C. Janson, Esq.	S. J. A. Salter, Esq.
R. Kippist, Libr. L. S.	W. W. Saunders, Esq., V.P.
J. S. Law, Esq.	Thomas Thomson, M.D.
John Lubbock, Esq.	John Van Voorst, Esq.
George MacLeay, Esq.	G. C. Wallich, M.D.
T. W. Mann, Esq.	Alfred White, Esq.
John Miers, Esq.	Joseph Woods, Esq.

The special Thanks of the Society were likewise directed to be given to Major Salmon, Executor of the late J. D. Salmon, Esq., F.L.S., in return for the bequest, by his late brother, of a valuable collection of birds' eggs, dried plants, numerous works on natural history, &c.

Mr. Stevens, F.L.S., exhibited specimens of 25 species of Birds, collected by Mr. A. R. Wallace, at Waigiou and Mysol, near New Guinea.

The Secretary read a Letter from R. B. Cooke, Esq., F.L.S., &c., dated "Scarborough, June 20th, 1861," and announcing the discovery of *Maianthemum bifolium* on the range of hills opposite Harkness, about $4\frac{1}{2}$ miles from Scarborough, where this rare and beautiful plant grows in the woods, among luxuriant specimens of *Trientalis europæa*.

The following Papers were read:—

1. "On West-African Tropical Orchids;" by John Lindley, Esq., Ph.D., F.R.S., L.S., &c. (See 'Botanical Proceedings,' vol. vi.)

2. "Note on the Structure of the Anther;" by Daniel Oliver, Esq., F.L.S., Prof. Bot. Univ. Coll. Lond. (See 'Transactions,' vol. xxiii. part 3.)

3. "Notes on *Coutoubea volubilis*, Mart., and some other *Gentianeæ* of Tropical America;" by Dr. R. H. Grisebach, F.M.L.S. (See 'Botanical Proceedings,' vol. vi.)

November 21st, 1861.

George Bentham, Esq., President, in the Chair.

Edward Clapton, M.D., was elected a Fellow.

Mr. Hanbury, F.L.S., exhibited specimens of the resinous wood of *Aquilaria Agallocha*, Roxb., a substance interesting as being the *Aloes* or *Lign. Aloes* of the Bible; and made some observations upon its production in Sylhet, Assam, and Cochin China.

Dr. Cobbold, F.L.S., made some observations, illustrated by sketches, on the mode of reproduction of *Gyrodactylus elegans*, a parasite upon the common Stickleback, and found abundantly by him in the Serpentine.

The following Papers were read, viz. :—

1. "On the Two Forms, or Dimorphic Condition, in the Species of *Primula*; and on their remarkable Sexual Relations;" by Charles Darwin, Esq., M.A., F.R.S., L.S., &c. (See 'Botanical Proceedings,' vol. vi.)

2. "Contributions to an Insect-Fauna of the Amazon Valley. —*Lepidoptera Heliconina*;" by Henry Walter Bates, Esq. Communicated by the Secretary. (See Abstract in 'Zoological Proceedings,' vol. vi.)

December 5th, 1861.

George Bentham, Esq., President, in the Chair.

Francis Ablett Jesse, Esq., and Charles John Leaf, Esq., were elected Fellows.

The President announced to the Society the following Resolution of the Council, agreed to at a Meeting held this day :—

“Resolved, that in conformity with chapter 2, section 6, and with chapter 7, section 2, of the Bye-laws, the name of Mr. Nathaniel Haslope Mason, who has failed to pay his arrears of annual contributions, and neglected repeated applications made to him for payment, be proposed to the General Meeting, to be held this day, for Ejection from the Society.”

The President then proposed the Ejection of Mr. N. H. Mason, and announced that the ballot upon the question would be taken at the next Meeting, on the 19th instant.

The following Papers were read :—

1. “On a new Genus of *Tunicata*, occurring on one of the Bellona Reefs ;” by John D. Macdonald, Esq., R.N., F.R.S. Communicated by the Secretary. (See ‘Zoological Proceedings,’ vol. vi.)

2. “Note on the Occurrence of the Crustacean, *Scyllarus Arctus*, in England ;” by Jonathan Couch, Esq., F.L.S. (See ‘Zoological Proceedings,’ vol. vi.)

3. “A Note on the Formation of Pearls ;” by Robert Garner, Esq., F.L.S. In this communication the author stated that, in his microscopical examination of pearls from mussels taken at the mouth of the Conway, he was led to attribute their formation to the deposit in the mantle of the exuviæ or secretions of a small species of *Distoma*.

December 19th, 1861.

The Meeting appointed to be held this day was postponed, by direction of the President, in consequence of the death of His Royal Highness The Prince Consort.

January 16th, 1862.

George Bentham, Esq., President, in the Chair.

William Chapman Hewitson, Esq., was elected a Fellow.

Nathaniel Haslope Mason, Esq., who was proposed for Ejection on the 5th of December, was balloted for and ejected, in conformity with the Bye-laws, chapter 7, section 2; and the President, in conformity with the same section of the Bye-laws, cancelled his name in the Register, and pronounced him to be no longer a Fellow of the Society.

The President announced that, at the Meeting of Council on the 9th instant, an Address of Condolence to Her Majesty on the Death of His Royal Highness The Prince Consort was agreed upon, and had since been sent accordingly to Sir George Grey: which Address was read to the Meeting, as follows:—

“ To the Queen’s Most Excellent Majesty.

“ Madam,

“ We, Your Majesty’s loyal and devoted subjects, the President and Council of the Linnean Society of London, in view of the great and calamitous bereavement which has befallen Your Majesty, and which has plunged the nation in one common grief, cannot refrain from offering to Your Majesty the heartfelt tribute of our sympathy and condolence. The noble qualities both of head and heart with which The Prince Consort was endowed, his extensive and varied acquirements, his sound judgment, the eminently practical character of his views, the excellence of his disposition, and the warm cordiality with which his enlightened mind applied itself to the support of every useful object and the promotion of every good work, had obtained for him so firm a hold on the public mind and affection, that his loss to the nation can be regarded as secondary only to that which Your Majesty has sustained.

“ By us, especially, as one of the Scientific Institutions of the land amongst whose members His Royal Highness was pleased to allow his name to be enrolled, his loss will be doubly and deeply felt, on account of the warm interest which, both by inclination and by study, he was ever ready to take in everything affecting the interests of science.

“ Laying before Your Majesty this our humble tribute of condolence, we fervently pray that the Divine Disposer of Events

will be graciously pleased so to temper the severity of this great calamity, that Your Majesty may be enabled to find the truest consolation under affliction, and the best support in its endurance, in the exercise of the privileges and the duties of your high station, and in the continuance of that parental and superintending care, which is so well calculated to render Your Majesty's Royal House a blessing to the nation, and an example to the other kingdoms of the earth."

"For the President and Council of the Linnean Society,
(Signed) "GEORGE BENTHAM, President."

Mr. Bates exhibited specimens of Lepidopterous Insects, in illustration of his Paper "On the Insect-Fauna of the Amazon Valley," read on the 21st of November, 1861.

The President read a Letter addressed to himself by Clement R. Markham, Esq., of the India Office, forwarding for presentation to the Society four pamphlets, printed for the use of those entrusted with the cultivation of *Cinchonæ* in India and Ceylon:— viz. 1. Report on the Cultivation of the Quina-tree in Java (translated from the '*Bonplandia*'): 2. Translations of Dr. Karsten's work on New Granada Barks, and Pœppig's on those of Huanuco: 3. Botanical descriptions of the species of *Cinchona* now growing in India and Ceylon; from the works of Weddell, Howard, &c.: 4. Mr. Spruce's Report on the 'Red Bark' region; and requesting that the President would mention to the Society how successful the introduction of the *Cinchona*-trees into the Neilgherry Hills has hitherto been.

"My last accounts," he says, "are dated November 30th, when the plants were in very fine condition; many of them in the most luxuriant state of health. Average growth of the month $2\frac{1}{2}$ inches; largest of the plants 3 feet 9 inches high.

"The number of plants was as follows:—

<i>C. succirubra</i>	4762
<i>C. Calisaya</i>	6
<i>C. nitida</i>	917
<i>C. micrantha</i>	1228
<i>C. Peruviana</i>	64
<i>C. Pahudiana</i>	175
Species without name	314
Total.....	<u>7466</u> plants.

“ Moreover, a new propagating-house has just been completed, and 25 acres of forest land have already been cleared for the Cinchona plantations. A very large supply of seeds of the *C. Condaminea*, from Loxa, was sent off to India and Ceylon this day. The great planting-out of Cinchonas in the Neilgherries will commence next spring.”

Dr. Hooker, V.P.L.S., gave an account of *Welwitschia mirabilis*, illustrated by drawings, specimens, and sections. This most extraordinary plant was detected in 1859 by Dr. Frederick Welwitsch near Cape Negro, in Western Africa, and described by him (under the provisional name of “*Tumboa*”) in the last volume of the Society’s ‘Journal’ (*Botany*, p. 185–6). The specimens were kindly sent for exhibition by Sir W. J. Hooker, K.H., F.R.S. & L.S., by whom they had been recently received from the discoverer.

February 6th, 1862.

George Bentham, Esq., President, in the Chair.

William Ferguson, Esq., John Daniel Moore, M.D., Henry Scott, M.D., Charles Tyler, Esq., and James Veitch, Jun., Esq., were elected Fellows.

The following Papers were read:—

1. “Notes on the Anatomy of the *Smynthuridæ* ;” by John Lubbock, Esq., F.R.S. & L.S.

Very different opinions have been held by various naturalists as to the true affinities of the *Thysanoura*, and the position which they ought to hold among the *Articulata*. Other aberrant groups, however, have been considered worthy of special study; but in the present instance this has not been the case, and the *Thysanoura* have been much neglected. The beauty of their colours, the elegance of their forms, and the frequency of their occurrence have all been unable to tempt our entomologists to the pursuit of animals which cannot be pinned, and are moreover more than suspected of having passed the fatal Rubicon of entomology.

The *Thysanoura* consist of two great groups, the *Lepismidæ*

and *Poduridæ*. M. Nicolet has already divided the latter into three groups,—the *Podurelles*, containing the elongated forms; the *Smynthurelles*, which correspond to the old genus *Smynthurus*; and the *Lipurelles*, for the non-saltatorial species. These three groups Mr. Lubbock considers as three families, and it is to the second of the three that his present observations are confined. To the two genera of which it has hitherto consisted he adds a third, characterized by having the antennæ four-jointed, without an elbow, and with a short terminal segment. The organs of respiration also are very different. Of this genus he describes two new species, as well as one of *Smynthurus*.

Without going through the various opinions which have been held as to the composition of the mouth in the *Poduridæ*, it may be sufficient to mention that M. Nicolet, whose views have generally been followed by succeeding writers, describes, first, a labrum; secondly, mandibles; thirdly, maxillæ; fourthly, a labium. He found no palpi. Mr. Lubbock, however, describes a pair of small palpi, and also a pair of membranous organs which represent perhaps the second pair of maxillæ. There is, moreover, another membranous body in front of the labium, which is equivalent, probably, to the *langue vésiculeuse* of the *Lepismidæ*. If this is to be considered as representing another pair of appendages, it is evident that the mouth of the *Thysanoura* presents several interesting peculiarities in which it differs from that of other hexapod Articulata and makes an approach to other groups of the great Annulose series. Mr. Lubbock, however, hesitates to draw the conclusions which seem to him to follow from these facts, until he shall have been able to study the construction of the mouth in other allied families.

The digestive organs consist of a narrow œsophagus, a capacious stomach, and a short rectum. The generative organs of the female consist of two egg-tubes, one on each side, communicating by a rather long vagina with the vulva, which opens with the anus at the posterior end of the body. The testes are formed on the same type as the ovary; at their posterior extremity they expand into a somewhat triangular "receptacle," two sides of which are accompanied by a glandular organ, the cavity of which is filled with minute granules. From each receptacle a short, narrow vas deferens leads into a somewhat pear-shaped ductus ejaculatorius, which opens in a papilla immediately in front of the anus. There appears to be no penis.

In *Smynthurus* the spiracles are two in number, and open on

the under side of the head—a most unusual position, and one for which we can as yet find a parallel only among the *Arachnida*; *Trombidium holosericeum* having the spiracles, according to Pagenstecher, at the base of the mandibles. In several other genera of *Thysanoura*, and even in the new genus of *Smynthuridæ* now described, Mr. Lubbock has found no tracheæ, and believes that respiration is principally effected through the general surface of the skin.

How different this account of the internal anatomy is from that given by M. Nicolet, a glance at his figures will show. In the digestive organs he describes and figures, first, *l'ésophage*; secondly, *jabot*; thirdly, *ventricule chylifère*; fourthly, *vaisseaux hépatiques*; fifthly, *intestin grêle*; sixthly, *cæcum* (the last no doubt a slip of the pen for rectum). In the respiratory system he finds eight spiracles on the dorsal surface of the first four abdominal segments, and an elegant network of tracheæ. Mr. Lubbock has not indeed as yet met with *Podura similata*—the species which M. Nicolet dissected; but that author appears to extend his descriptions to the whole group, and has been so understood by subsequent writers. Even if his descriptions are correct for the species with which he worked, they cannot be applied to the other genera; and the statements made in general works on comparative anatomy must therefore be considered as altogether erroneous.

The so-called “gastric tube,” and the two tentacles which proceed from it, are not the least curious part of the anatomy of *Smynthurus*. The tube itself is situated between the posterior legs; and the two colourless, semi-transparent tentacles which can be projected from it are about $\frac{1}{10}$ an inch in length, and are covered with gland-like papillæ. When creeping on a slippery surface the animal uses these tentacles to ensure its hold, or if turned over on its back, avails itself of their assistance to regain its normal position. Each tentacle contains two muscles, one of which is attached at the extremity, and the other at a point about halfway. These two muscles are, at their other end, attached to the back close together. We might at first be inclined to wonder at the presence of two muscles, and to suppose that the object might have been equally well attained by a single one. The two, however, acting on different parts may enable the organ to be retracted more quickly than might otherwise be the case—an advantage doubtless of much importance in a structure so delicate. Again, it is evident that a single muscle attached to the end could not have fully retracted the tentacle, because the distance between

the point of attachment of the muscle and the ventral tube is less than the length of the tentacle; but this difficulty is at once avoided by the presence of a second muscle, which throws the retracted tentacle into a curve. Moreover, the muscles are already greatly extended when the tentacle is protruded to its full length, but must have been much more so if there had only been a single muscle.

2. "On the Geographical Relations of the *Coleoptera* of Old Calabar;" by Andrew Murray, Esq., F.L.S., Assist. Sec. R. Hort. Soc.—(See 'Zoological Proceedings,' vol. vi.)

the under side of the head—a most unusual position, and one for which we can as yet find a parallel only among the *Arachnida*; *Trombidium holosericeum* having the spiracles, according to Pagenstecher, at the base of the mandibles. In several other genera of *Thysanoura*, and even in the new genus of *Smynthuridæ* now described, Mr. Lubbock has found no tracheæ, and believes that respiration is principally effected through the general surface of the skin.

How different this account of the internal anatomy is from that given by M. Nicolet, a glance at his figures will show. In the digestive organs he describes and figures, first, *l'ésophage*; secondly, *jabot*; thirdly, *ventricule chylifère*; fourthly, *vaisseaux hépatiques*; fifthly, *intestin grêle*; sixthly, *cæcum* (the last no doubt a slip of the pen for rectum). In the respiratory system he finds eight spiracles on the dorsal surface of the first four abdominal segments, and an elegant network of tracheæ. Mr. Lubbock has not indeed as yet met with *Podura similata*—the species which M. Nicolet dissected; but that author appears to extend his descriptions to the whole group, and has been so understood by subsequent writers. Even if his descriptions are correct for the species with which he worked, they cannot be applied to the other genera; and the statements made in general works on comparative anatomy must therefore be considered as altogether erroneous.

The so-called “gastric tube,” and the two tentacles which proceed from it, are not the least curious part of the anatomy of *Smynthurus*. The tube itself is situated between the posterior legs; and the two colourless, semitransparent tentacles which can be projected from it are about $\frac{1}{10}$ th of an inch in length, and covered with gland-like papillæ. When creeping on a slippery surface the animal uses these tentacles to ensure its hold, or if turned over on its back, avails itself of their assistance to regain its normal position. Each tentacle contains two muscles, one of which is attached at the extremity, and the other at a point about halfway. These two muscles are, at their other end, attached to the back, close together. We might at first be inclined to wonder at the presence of two muscles, and to suppose that the object might have been equally well attained by a single one. The two, however, acting on different parts, may enable the organ to be retracted more quickly than might otherwise be the case—an advantage doubtless of much importance in a structure so delicate. Again, it is evident that a single muscle attached to the end could

not have fully retracted the tentacle, because the distance between the point of attachment of the muscle and the ventral tube is less than the length of the tentacle; but this difficulty is at once avoided by the presence of a second muscle, which throws the retracted tentacle into a curve. Moreover, the muscles are already greatly extended when the tentacle is protruded to its full length, but must have been much more so if there had only been a single muscle. (See 'Transactions,' vol. xxiii. Part 3.)

2. "On the Geographical Relations of the *Coleoptera* of Old Calabar;" by Andrew Murray, Esq., F.L.S., Assist. Sec. R. Hort. Soc. (See 'Transactions,' vol. xxiii. Part 3.)

February 20th, 1862.

George Bentham, Esq., President, in the Chair.

Thomas Glazebrook Rylands, Esq., was elected a Fellow.

The following Papers were read, viz.:—

1. "On Prolification in Flowers, and especially on that kind termed 'Axillary Prolification;'" by Maxwell T. Masters, Esq., F.L.S. (See 'Transactions,' vol. xxiii. Part 3.)

2. "On *Inocarpus*;" by George Bentham, Esq., Pres. L.S. (See 'Botanical Proceedings,' vol. vi.)

3. "Note on *Hamamelis* and *Loropetalum*; with a description of a new *Anisophyllea*;" by Daniel Oliver, Esq., F.L.S., Prof. Bot. Univ. Coll. Lond. (See 'Transactions,' vol. xxiii. Part 3.)

4. "Notice of a Collection of *Algæ*, made on the North-west Coast of North America, chiefly at Vancouver's Island, by David Lyall, M.D., in 1859-61;" by W. H. Harvey, M.D., F.R.S & L.S., Prof. Bot. Univ. Dublin. (See 'Botanical Proceedings,' vol. vi.)

March 6th, 1862.

George Bentham, Esq., President, in the Chair.

Albany Hancock, Esq., Thomas Hyde Hills, Esq., and Robert McLachlan, Esq., were elected Fellows.

Dr. Cobbold, F.L.S., communicated the substance of a Paper, entitled, "Histological Observations on the Eye of the Cod-fish (*Morrhua vulgaris*), with especial reference to the Choroid Gland and the Cones of the Retina." (See 'Zoological Proceedings,' vol. vi.)

March 20th, 1862.

George Bentham, Esq., President, in the Chair.

The Right Hon. Lord Lilford, W. H. Flower, Esq., St. George Jackson Mivart, Esq., and Benjamin Leadbeater, Esq., were elected Fellows.

Read, 1st, the following Letter from Professor Babington, F.R.S. & L.S., accompanying specimens of *Isoëtes echinospora*, Durieu, from the neighbourhood of Llanberis, for the Society's British Herbarium :—

"To the Secretary of the Linnean Society of London.

Cambridge, 22nd February, 1862.

"MY DEAR SIR,—Will you have the kindness to place before the Linnean Society, and afterwards deposit in the British Herbarium, the enclosed specimen of *Isoëtes echinospora*, Dur., named by him. I am not able to state the exact spot near Llanberis (Caernarvonshire) where I gathered the plant in 1847, but believe it to have been in the Lower Lake. I am sorry that the specimen is not finer; but all the specimens that I have seen are smaller than those of *I. lacustris*, and the best that I possessed were sent to France.

"Mr. W. Wilson, the celebrated muscologist, has furnished M. Durieu and myself with a specimen between us of the same species,

gathered by him in a pool near Llyn y Cwn, Caernarvonshire, on June 30, 1828; and Dr. Dickie has sent one, for similar division, from Loch of Park, near Aberdeen, where it was gathered by Mr. Sutherland.

“I do not enter upon a discussion of the characters of these plants, because Messrs. Durieu de Maisonneuve and Gay will publish a paper upon them and other species of *Isoëtes* at an early date. It may, nevertheless, be well to mention that Mr. Gay gives the characters to me as follows:—

“*I. lacustris* (L.); folia stricta atro-viridia; macrosporæ superficiei obtuse tuberculatæ quasi farinacæ.

“*I. echinospora* (Dur.); folia molliora patentissima læte viridia, senescentia e viridi-flava, macrosporæ acutiuscule tuberculatæ, quasi echinatulæ.’

“The ‘Bull. Soc. Bot. de Fr.’ viii. 164 is the place where a distinctive name and character were given to the plant.

“Yours very truly,

“C. C. BABINGTON.”

2. “Observations on some Skulls from Ceylon, said to be those of Veddahs;” by George Busk, Esq., F.R.S., Sec. L.S. (See ‘Zoological Proceedings,’ vol. vi.)

April 3rd, 1862.

George Bentham, Esq., President, in the Chair.

Percival Forster, Esq., Septimus Holmes Godson, Esq., and James Thomson, Esq., were elected Fellows.

Dr. Cogswell, F.L.S., exhibited a fine specimen of gold-bearing quartz, from the neighbourhood of Halifax, Nova Scotia; and Prof. Tennant exhibited, on the part of the Government of Nova Scotia, a valuable series of ores and specimens of gold from that Province, and made some observations upon them.

The following Papers were read:—

1. “On the three remarkable Sexual Forms of *Catasetum tridentatum*, an Orchid in the possession of the Linnean Society;” by Charles Darwin, Esq., F.R.S., F.L.S., &c. (See ‘Botanical Proceedings,’ vol. vi.)

2. "On the discovery of *Gladiolus illyricus*, Koch, in the Isle of Wight," by A. G. More, Esq., F.L.S. (See 'Botanical Proceedings,' vol. vi.)

Dr. Macdonald, F.L.S., afterwards communicated, orally, the substance of a Paper "On the Classification of the Warm-blooded *Vertebralia*, and their Parallelism."

April 17th, 1862.

George Bentham, Esq., President, in the Chair.

The following Papers were read:—

1. "Notes on the Exogenous Flora of the Anamallay Mountains, in South India, with descriptions of New Species, and a Catalogue of the Ferns;" by Capt. R. H. Beddome, Assistant Conservator of Forests. Communicated by Thomas Thomson, M.D., F.R.S. & L.S.

2. "On African *Anonaceæ*;" by George Bentham, Esq., Pres. L.S. (See 'Transactions,' vol. xxiii. Part 3.)

3. "On the Structure of the Mantle in *Testacella*;" by Lovell Reeve, Esq., F.L.S. (See 'Zoological Proceedings,' vol. vi.)

4. "On the Spiral Markings of the Flocci in the genus *Trichia*;" by the Rev. M. J. Berkeley, M.A., F.L.S.

May 1st, 1862.

George Bentham, Esq., President, in the Chair.

Edward Romilly, Esq., was elected a Fellow; Dr. D. F. Eschricht, Dr. H. Lacaze-Duthiers, and Dr. Hermann Schlegel, Foreign Members; and Mr. Edward Gerrard, an Associate.

The Special Thanks of the Society were directed to be given to Lady Smith, in return for the following Donations, viz.:—1. A

presentation copy to Linnæus of Lord Baltimore's 'Gaudia Poetica;' 2. 'Memoirs relating to European and Asiatic Turkey,' and 'Travels in various Countries of the East,' edited by the Rev. R. Walpole; the latter work containing copious extracts from the Journals of the late Dr. Sibthorp.

The following Papers were read, viz. :—

1. "On the abnormal Habits of some Females of the genus *Orgyia*;" by H. T. Stainton, Esq., F.L.S. (See 'Zoological Proceedings,' vol. vi.)

2. "Florula Mallica;" by M. P. Edgeworth, Esq., F.L.S. (See 'Botanical Proceedings,' vol. vi.)

May 24th, 1862.

Anniversary Meeting.

George Bentham, Esq., President, in the Chair.

This day, the Anniversary of the Birth of Linnæus, and the day appointed by the Charter for the Election of Council and Officers, the President opened the business of the Meeting with the following Address :—

GENTLEMEN,

IN addressing you for the first time from this Chair on the occasion of your annual gathering, I have to thank you for that kind support and assistance which enables me to congratulate you on a continuance of the state of prosperity to which the Society had been brought under the zealous superintendence of my predecessor. Before leaving the Chair, he had the satisfaction of announcing to you that the debt which had been so long hanging over us in consequence of the purchase of the Linnean Collections had been at last cleared off, and that a commencement had been made of permanent investments. He also expressed his opinion that in future the whole amount of life-compositions received from new Fellows should be added to these investments. We have accordingly, as a step towards this desideratum, purchased, out of the present year's balance, additional stock to the

amount of £300; and although I should be of opinion that a portion of the sums received from Life Members should be added to those contributed by our other Fellows in order to meet our legitimate amount of expenditure, yet I trust we shall continue in each year to add to our permanent capital, or lay out in additions to our library or other valuable property an amount nearly equivalent to these compositions, leaving a sufficient annual income to increase rather than diminish the extent of our publications.

But if I thus dwell with complacency on the prosperous state of our financial affairs, compared especially with what they were when Mr. Bell first took the Chair in 1853, let it not be supposed that I should willingly acquiesce in any relaxation of your efforts still further to increase that prosperity. The demands upon the funds of a Society established for the encouragement of natural science only multiply as the study of that science advances and becomes more general. The number of new works which we ought to add to our library for the use of our working members is greater every year; and much as we have extended our publications, we would wish to do so still more. New theories and speculations, popular and elementary works, find indeed that ready sale in the general world which renders them independent of associations like ours; but we must facilitate the publication of abstract researches and records of observation of detail, which are often remunerative only in the inverse proportion of their value; for we may thus assist in guarding against the perversion of the science by the multitude of crude but showy works issued in its name to please the paying public. I sincerely trust, therefore, that not only will our present members continue that support which is so necessary for our objects, but that they will induce such of their friends as feel an interest in natural science, and have either time or means at command, to join us in promoting the common cause. It has always appeared to me a mistaken idea that the Fellows of the Linnean Society should be limited to those who have shown a proficiency in natural science; we should hope indeed to include all such in our body; but they require the encouragement of friends and patrons, and work with increased zeal when aided by the association of those lovers of natural history, who, having little leisure to devote to it, contribute nevertheless to our means, attend occasionally our meetings, glance over our proceedings, and generally watch our progress.

With respect to the working Fellows of the Society, whose numbers have augmented so much of late years, I trust it will not be thought presumptuous on my part if, in enumerating a few of the principal

zoological and botanical works which have recently appeared, I also call their attention to a few points, the investigation of which seems to be specially required at the present time. It is true that the leaders of the science whom we are proud to reckon among our Fellows may well consider these remarks as superfluous, but I now address myself more especially to those who, having but a portion of their time to devote to natural history, or limited materials at their disposal, may be pleased to have their attention directed to a few subjects upon which their observations, however minute and isolated, may, if careful and accurate, contribute usefully to the general advancement of science. And if I take my illustrations chiefly from Botany, it is because that is the branch more immediately connected with my own pursuits; but the same principles are applicable to zoological investigations, the intimate connexion of the two sciences in all their details becoming every day more evident, and I have to thank my friend Mr. Busk for the selection of those new zoological works which appeared most deserving of notice on the present occasion.

The field of the science is so extensive, and its surface so varied, that we must take separately the salient points from which we can penetrate into its depths. I do not allude to the divisions of the science according to the groups of animals or plants treated of; but in each department the attention of zoologists or botanists may be separately directed to general systems and classification, monographs, floras or faunas, descriptions of individual collections, animal and vegetable physiology, including homology of organs and comparative anatomy and biology—if that name may be applied to the history of animal and vegetable life—independently of organic chemistry, palæontology, practical zoology and botany, and other branches which only partially come within the limits assigned to us.

Upon general systems and classification the few words I should have to say would be more in terms of deprecation than of encouragement. The great groups into which animals and plants have been distributed have been gradually established and characterized by the combined genius and lifelong labours of the most eminent naturalists, and no modifications can be accepted until their effects shall have been tested in all their details. All these systems are no doubt susceptible of improvement, and the investigation of characters to be derived from organs hitherto neglected, either from their minuteness or from other causes, might be of great importance, and would always be a legitimate object of our researches. Well-digested series of observations on the position of the ovule, the direc-

tion of its raphe and micropyle, considered with reference to their constancy or variability in large groups of plants, verifying and following up those which have been already published by one of our most careful observers, Mr. Benjamin Clarke,—on the constancy in genera or orders of those various forms of pollen, which have been described in detail by Mohl, Schacht and others as prevalent in large groups, but some of which Mr. Darwin has recently shown to be individual differences in different flowers of the same species,—on the conformity of anatomical structure of the stem with other characters on which large groups are formed, which has chiefly occupied the attention of French botanists,—and any similar researches would be valuable contributions to our publications, provided their authors do not, by attaching an undue or, at any rate, premature importance to characters they have thus brought to light, proceed at once to generalization, remodelling the whole system of classification, and throwing everything into confusion by new names and new combinations which can never be safely adopted without re-examining and testing in detail that complication of characters upon which the old ones had been gradually established. Tabular arrangements of classes, orders, and minor groups, regularly defined by new characters, are tempting to make, and may look well on a black board; but if we have hitherto refused a place in our Transactions to those which have been offered to us, and if I do not here allude in particular to any of those which we are continually receiving, it is because we have seen no evidence of their being more than theoretical speculations, untested by a study of the innumerable exceptions which Nature offers to all our systems. And on this head I cannot resist applying to our own Transactions and Proceedings the words of Cuvier, prefixed to the *Nouvelles Annales du Muséum*, in 1832:—“ L’expérience leur a appris, que ce qui dans des recueils de ce genre conserve un intérêt durable, ce que les savants consultent longtemps encore après la publication, ce sont les descriptions exactes et les bonnes figures d’espèces nouvelles, les caractères nouveaux découverts dans les espèces anciennes et propres à en rendre la distribution plus naturelle, ou la détermination plus précise, les faits nouveaux bien constatés dans leur histoire, les détails positifs et bien décrits de leur anatomie. . . . enfin tout ce qui, une fois consigné par écrit, demeure comme une partie intégrante de la science. Chacun peut s’apercevoir, au contraire, que les pures conceptions de l’esprit, les dissertations théoriques, les hypothèses variables au gré de l’imagination qui les crée, en se renversant l’un l’autre d’année en année, quelque éclat qu’elles puissent jeter, quelque bruit qu’elles puissent faire au moment où elle paraissent, tombent

bientôt dans le même oubli où sont tombées les hypothèses et les théories qui les avaient précédées, et qu'après quelque temps, les écrits où on les a exposées ne sont plus recherchés que par les curieux qui ne veulent ignorer aucun trait de l'histoire des sciences, laquelle n'est que trop souvent l'histoire des aberrations de l'esprit humain."

But if general systems are now too vast and comprehensive to be interfered with by the zoologist or botanist who cannot devote his life to the subject, he may, by limiting his researches to such portions as he can thoroughly investigate—to monographs of new or imperfectly known species, genera, or orders—supply contributions of the highest value to the science. If any naturalist has the opportunity of examining or studying any little-known animal or plant, or any group hitherto comparatively neglected or misunderstood, if he will draw up his descriptions from actual observation of specimens, carefully collating all that has been previously published on the subject, comparing the subjects of his investigation with allied species or groups—not with their published descriptions only, but with actual specimens, attaching more importance to giving good characters to the groups he forms than to multiplying their names, and, above all, taking every precaution to insure accuracy of detail, and verifying, by repeated examination of different specimens, every observation which may be new or at variance with those of his predecessors, he may be sure that his labours will be duly appreciated. Papers of this kind, when not attractive as works of art, are indeed not generally remunerative to their publishers; but we should always consider it a legitimate application of our funds to insert them in our Transactions or in our Journal, with more or less of illustration according to their scientific interest or importance.

Amongst zoological monographs which have been most recently published, Mr. Busk has called my attention to the completion of Mr. Gould's splendid work on the Trochilidæ, unrivalled in the beauty and fidelity of the plates, and containing in the introductory portion an interesting and compendious account of the distribution and classification of Humming-birds. In the subkingdom Mollusca, the elaborate memoir of M. Lacaze-Duthiers (whom you have just elected into one of the vacancies among our Foreign Members) on the Anatomy and Embryology of *Vermetus* has added much to our knowledge of Molluscan organization. Under Crustacea I should notice Professor Leydig's Natural History of the Daphnidæ; and under Arachnida, Professor Leuckart's important memoir on the Structure and Development of the Pentastomata, and Dr. Pagen-

stecher's Contributions to the Anatomy of the *Acari* or Mites. In the lower subkingdoms Professor Milne-Edwards's Natural History of Corals and Polypes has been completed by the publication of the third volume, whilst the works of Claparède and Lachmann and of Stein on the classification and organization of the Infusoria, and especially of M. Balbiani on the reproduction of those animals, cannot but be regarded as of the greatest interest and value. Nor can the important and curious observations of Dr. George Wallich and of M. Alphonse Milne-Edwards on the existence of even highly organized animal life at enormous depths in the sea be passed over without especial notice, subversive as they are of many of the hitherto prevalent notions on the subject, and of the highest interest in several points of view.

In Cryptogamic Botany I need not mention the numerous illustrated fern-works which the present fashion has called forth; for the majority of them are hardly scientific; but I cannot pass over the elaborate and careful Species Filicum of Sir William Hooker, of which the 13th Part, comprising the first portion of the most difficult Aspidiæ, has been lately issued, without expressing my most anxious hope that its distinguished author may long enjoy his present health and vigour, so as to bring that valuable work to a conclusion. I must also refer to Tulasne's beautifully illustrated Selecta Fungorum Carpologia as the most important work on fungi which has appeared for a long time.

In Phænogamic Botany we have not within the last year or two witnessed the publication of any of those model monographs of Orders of which we owed so many to the late Adrien de Jussieu and others of the French school; Weddell's Urticeæ being one of the last that has appeared. But several monographic papers have been inserted in Journals or Transactions of Societies which may illustrate the principles I have above alluded to. Of those orders which, having been treated only in the early volumes of DeCandolle's Prodrômus, have now required a thorough revision, a considerable number have been the subject of more or less complete monographs, amongst which I would particularly mention Planchon and Triana's Guttiferæ in the Annales des Sciences Naturelles, and Prof. Oliver's Aurantiaceæ in our own Journal,—both of them valuable contributions to science as examples of thorough investigation, careful observation, and sound criticism; whilst M. Jacob Müller, who in a three days' excursion in the Vosges finds 31 new Brambles, and devotes 40 pages of the Bonplandia to their description, and 225 pages of the Pollichia to 239 *Rubi* from a very limited Gallo-Germanic region, may be said

to have done little more than supply the world with so much waste paper. Of DeCandolle's *Prodromus* itself, which is now a series of monographs, a half-volume, comprising the genus *Euphorbia*, has been recently published. The remainder of the order of Euphorbiaceæ, one of the most extensive as well as the most varied and complex in structure and affinities of the whole vegetable kingdom, is now in the hands of M. J. Müller of Geneva, who, besides the special difficulties of the subject, will have to collate and bring into concordance the works of two laborious and careful observers of opposite tendencies—the late Dr. Klotzsch leaning to a multiplication of technical genera, and M. Baillon to the adoption of theoretical genera without contrasted characters or systematic arrangement. Laurineæ, an order as difficult from the great similarity of its genera and species as Euphorbiaceæ from their diversity, are, I believe, nearly ready for press, from the experienced hands of Prof. Meisner; and M. DeCandolle himself is working out the Amentaceæ. Among the orders not intended to be included in the *Prodromus*, I must notice M. Weddell's valuable monograph of *Cynomorium*, and the appearance of a third part of Dr. Boott's beautiful *Illustrations* of the genus *Carex*. This important work, which at great cost of time and money its distinguished author, in every sense of the word, has presented to science, now brings down to 411 the number of species or marked varieties of this difficult genus, whose characters are thus permanently fixed by detailed and accurate delineations. Gramineæ, which have been thrown into so much confusion by the so-called synopsis of Steudel, have been taken in hand by several botanists; but, whilst Dr. E. A. Rémy is indulging in new systems founded upon insufficient investigations of detail, and Dr. Ch. Müller multiplies phytogeographical species, Col. Munro is perhaps the only one who has devoted to them the care and research necessary for a good monograph. As yet, however, he has published but little beyond the *Revision of the Grasses of the Linnean Herbarium*, inserted in our own *Journal*.

Another class of writings by which science may be advanced by the descriptive naturalist comprises what are generally designated as *Faunas* and *Floras*; and these would claim admission into our own publications, or encouragement as independent works, not only according to their intrinsic merit, but according to the countries they treat of.

These *Faunas* and *Floras* have a twofold purpose to answer:—1st, as guides to the beginner or amateur, to the travelling or resident naturalist, in the determination and history of the animals

and plants of any particular country or district; 2ndly, to supply data to the general naturalist in his investigation of questions of geographical distribution and local influences on individual species or genera, independently of their utility in practical zoology and botany. For the former purpose, clearly contrasted characters adapted to local varieties or forms are the great desideratum; for the second, completeness and, above all, accurate determination and careful comparison with identical or allied forms in adjoining or more distant countries. It is satisfactory, therefore, to observe that authors of the most recent local Faunas and Floras, or enumerations of species, are perceiving the necessity of studying the animals or plants of other countries besides their own; and the designation of the local *habitats* of their species is now generally followed by that of their general geographical distribution, which it is to be hoped will be always either founded on actual inspection of specimens or accompanied by a reference to the authority relied on.

Our Society was chartered for "the cultivation of the Science of Natural History in all its branches, more especially of the Natural History of Great Britain and Ireland;" but with regard, at least, to the higher animals and phænogamic plants of our country, the great and increasing interest taken in them by the paying public leaves us as a Society little or nothing to do. The British quadrupeds, birds, fishes, and the more showy insects, are illustrated in works of great merit; and fresh editions of our standard Floras succeed each other rapidly. It is little more than a twelvemonth since the publication of the eighth edition of Hooker's Flora by Arnott, and the fifth of Babington's Manual has been issued in the present month; each one incorporating whatever recent observations may have added to or corrected in the previous ones. In the latter work I particularly notice that, besides numerous amendments of detail, Prof. Babington has remodelled his synopsis of the natural orders after the plan of the French analytical keys. All notices of new localities and enumerations of species observed in local districts would therefore be more useful if communicated to the editors of these works, than if sent to our Society for insertion in our records. It is in the lower orders of animals, and in some branches of Cryptogamic Botany, that much remains to be observed and described before the inhabitants of our island can be said to be well known. Some important contributions have recently appeared, amongst which I would especially notice the History of British Sessile-eyed Crustacea, by Messrs. Spence Bate and Westwood; the Monograph of British Spiders, by Mr. Blackwall, the first volume of which has been

published by the Ray Society; and Mr. Gosse's *Actinologia Britannica*: to these I might add Mr. Lubbock's *History of our Sminthuridæ*, now printing for our Transactions, which reveals to us so much of interest and novelty in a whole series of creatures swarming around us, and yet hitherto allowed to pass almost unnoticed.

Turning to the Continent, the greater part of Europe comprised in the general districts of France, Germany, Scandinavia, and Russia is almost as rich as ourselves in general and local Floras. The works of Grenier and Godron, Koch, Reichenbach, Fries, Hartmann, and Ledebour, give us a very good account of the phænogamic vegetation of central and northern Europe; and I notice amongst recent additions, besides a carefully revised edition of Cosson and Germain's *Flore des Environs de Paris*, the first part of a new and elaborate Flora of Norway, by Professor Blytt, containing the Monocotyledons, upon which the author has evidently bestowed the greatest pains. All that is known of the Arctic Flora has also been condensed and applied more especially to the extension of geographical botany, in Dr. Hooker's important paper in the last part of our Transactions. In the south of Europe the Italians are not far behind. Bertoloni's voluminous *Flora Italica* is very complete, although not quite up to the present state of science. Parlatore's elaborate *Flora Italiana* has not yet got beyond Monocotyledons, which occupy two volumes. It is to be hoped that the very extended plan he has adopted may not stand in the way of its completion. In the meanwhile, they have many local Floras, amongst which Gussone's very careful *Synopsis of the Sicilian Flora*, rather overdone, perhaps, as to species, and Moris's excellent *Flora Sardoæ* (that is to say, of the old kingdom of Sardinia), of which Dicotyledons are completed in three quarto volumes, are the most important. The Spanish Peninsula is much more in arrear. There is no professedly complete Flora since the four quartos of Quer, two of which are ante-Linnean, and the two last not much more recent; and most of what we have learnt in modern days of its vast botanical treasures has been from the works of foreigners, especially from the valuable and beautifully illustrated ones of Boissier and Willkomm. The herbaria of Madrid contain great stores of materials on which to found a Spanish Flora; and that Spain is not deficient in botanists well qualified to make use of them is shown by the scattered papers of Graells, Colmeiro, Costa, and others: yet it is again to a foreigner that they leave the task, and Willkomm, author of the splendid *Icones Plantarum Europæ Austro-occidentalis*, above alluded to, assisted by Dr. Lange of Copenhagen, has now issued the first volume of an octave Flora, completing

Monocotyledons and Apetalæ. The south-eastern peninsula of Europe, comprising Greece and Turkey, has still less means of publishing indigenious Floras. The Austrian portion alone has been well investigated and illustrated by Visiani's excellent *Flora Dalmatica*; what we know of the remainder has been due to the works of British, German, or French botanists, none of which are sufficiently recent or comprehensive to be here mentioned. The flora of the Levant, which, although technically a part of Asia, is in its natural productions so closely connected with southern Europe, and so particularly interesting as the country from which or through which so many early cultivated plants had proceeded, had, since the days of Tournefort, been little investigated until taken in hand by Boissier, who is preparing a general *Flora Orientalis*, in which it is hoped he will condense, and in some instances reform, the very numerous species described by himself and others. In the meantime, M. de Tchihatcheff has published a very useful general summary under the title of *Éléments d'une Flore de l'Asie Mineure*.

Beyond the limits of Europe, I may first refer to our own Colonies. A general summary of the steps taken to procure a uniform set of these floras was inserted, by Dr. Hooker, in the *Natural History Review* for July last, and I have only now to report progress. The fifth part, recently issued, of Grisebach's *Flora of the British West India Islands* has brought it down to the commencement of Monocotyledons; the fourth part of Thwaites's *Enumeration of Ceylon Plants* goes far into Monocotyledons; and each of these compact but comprehensive works will, it is hoped, be very shortly completed by the issue of one more part. The printing of the second volume of Harvey and Sonder's *Flora Capensis*, comprising *Leguminosæ* and *Calycifloræ*, is nearly finished. Our Indian botanists have been active, as evidenced by the *Præcursores Floræ Indicæ* of Drs. Hooker and Thomson, the *Flora Adenensis* of Dr. T. Anderson, Mr. Edgeworth's *Account of Punjâb Plants*, and other papers communicated to our Society; and although, some years since, an excellent opportunity for giving to the world a really good *Flora* of that rich and varied territory—more wanted, for a variety of purposes, than any other botanical work—was lost by an ill-advised want of liberality on the part of the then East India Company, I have now strong hopes that the present Indian Government will at length make such arrangement as will enable Dr. Hooker to lay before the scientific and industrial public, in the shape of a compendious *Flora Indica*, the results of his own important labours and

observations, aided by the vast materials collected at an enormous cost during the last half-century, and now deposited at Kew or in our own Museum. In Australia, Dr. Ferdinand Müller, the eminent Government Botanist of Victoria, has completed the first volume, comprising *Thalamifloræ*, of an elaborate account, in quarto, of the rich flora of that colony, illustrated by a considerable number of lithographic plates, which do credit to colonial art. This Flora is particularly valuable in showing the views in regard to the consolidation of supposed species entertained by a scientific botanist, working in a great measure upon living specimens. Of Dr. Harvey's beautifully illustrated *Phycologia Australica*, the fourth volume is now nearly completed.

The utility of Colonial Floras has been recognized by other Governments as well as our own. The practical Dutch have especially applied themselves to obtaining a correct knowledge of the vegetable productions of their dependencies. The numerous partial works of Blume, Korthals, Hasskarl, Junghuhn, and others, some of them splendidly illustrated, and, consequently, too expensive for ordinary use, have been condensed into a complete *Flora van Nederlandsch Indie* by Professor Miquel, who, in the course of six years, has given us the whole of *Phænogamia*, in four volumes, with a supplementary volume for Sumatra. We have not here, therefore, to bewail that tardiness which leaves so many important works unfinished at the death of their authors, or, if complete, with the first volumes antiquated before the last make their appearance; on the contrary, we could have wished that the author had given himself a little more time to work out the details with that accuracy of research which we should have expected from a botanist of his well-proved ability.

To the same class of Natural Histories of distant dependencies may be referred the results of the Russian expeditions to explore their newly acquired territories on the Amoor. Dr. Leopold v. Schrenck's *Reisen und Forschungen im Amur Lande* is one of the most important contributions to our knowledge of the fauna of Northern Asia, and of the geographical distribution of animals, and more especially of the Mammalia; whilst M. Maximovitch's *Primitiæ Floræ Amurensis* is an admirable account of the botany of the district as far as hitherto known, and of its physical geography in relation to vegetation. From the former, amongst the numerous interesting observations it contains, we learn the startling fact of the existence of the Tiger as a permanent and ordinary resident, even in winter, on the Amoor, or up to about the 50th degree of N. latitude, where, as shown by Maximovitch, the river is frozen over for at least six

months of the year, and the thermometer descends not unfrequently during the winter to below -30° Reaumur (-36° Fahrenheit).

The remainder of Asia comprises the two empires of China and Japan, which have been hitherto almost a sealed book to our naturalists. Japan, the flora of which had been partially known by the investigations and importations of Siebold, and is now proving a rich field for our horticultural collectors, has been the subject of a remarkable paper by Dr. Asa Gray, throwing a new light on the geographical relations of the floras of America and Asia; and a complete enumeration of all the species known to be indigenous to the Japanese islands, by Mr. Black, originally appended to Hodgson's 'Residence in Nagasaki,' has been inserted in a revised form in a recent number of the *Bonplandia*. But of the Chinese flora we still know nothing, except that of a few points on the coast or of the neighbourhood of Peking explored chiefly by Russian botanists.

The vegetation of Africa has lately been exciting a great deal of interest. When Harvey and Sonder's *Flora Capensis*, above alluded to, and the French official *Flore d'Algérie*, now apparently at a dead stop, shall have been completed, those two works, with A. Richards's *Flora of Abyssinia*, Webb's great work on the Canary Islands, and Lowe's *Madeira Flora*, of which the second part has now appeared, will have given us a fair idea of the principal extra-tropical or subtropical regions; but from within the tropics little has been done as yet towards publishing the very great additions now being made to its known vegetation. The collections of the late Mr. Barter, and especially of our present active and enterprising botanical traveller, Mr. G. Mann, have thrown a new light on the geographical relations of the Western Flora. Dr. Kirk has remitted to us, from the Eastern side, many interesting novelties, notwithstanding the loss of an important portion of his collections in a whirlpool on the Zambesi; and Dr. Welwitsch's arduous travels in the Mossamede and Angola country would have been fully rewarded even had their results been limited to the discovery of the *Welwitschia*, that misshapen mass representing the tree vegetation of those sandy coasts, of which specimens were recently laid before you, and whose wonderful structure will, I hope, be explained by Dr. Hooker in all its scientific bearings in the next part of our Transactions. Of all these riches but little has yet been published. Dr. Hooker has given us an interesting account of the vegetation of Clarence Peak, to be followed, I hope, ere long, by a paper on the still more remarkable collection just received from the Cameroon Mountains. The first portion of the description of the plants collected

in Mosambique by Dr. Peters has been published at Berlin in a pretentious illustrated volume, chiefly by the late Dr. Klotzsch. Dr. Welwitsch has given a preliminary list of the Angola portion of his collections, in the *Annales do Conselho Ultramarino* for 1858; Dr. Wawra and M. Peyritsch, in a *Sertum Benguelense*, have described a small set of Benguelan plants gathered by the former during a fortnight's stay of the Austrian corvette *Carolina* on that coast; and a few detached papers on isolated genera or species have appeared here or at Paris. I may add, however, that there is now some hope that our Admiralty is about to take steps for obtaining some practical result from these botanical expeditions, in the shape of a General Flora of tropical Africa.

Next to tropical Africa, the most remarkable novelties in botany are supplied by New Caledonia and Madagascar. These are chiefly in French hands; and detached notices of some of them have appeared in various French periodicals. I understand, also, that the authorities of the *Jardin des Plantes* are in hopes of inducing their Government to sanction at least a Flora of New Caledonia, in imitation of the Colonial Floras of other Governments.

There remains the New World; and here my first feeling is one of deep pain, in which all lovers of progress and civilization must partake. The deplorable internecine contest now going on in the once United States of North America appears to have put a stop to all works of importance in natural history, so many of which were supported at considerable cost by their Government. Dr. Torrey's papers on Fremont's Californian Plants and Mr. Chapman's Flora of the Southern States were fortunately completed before the outbreak; but the valuable publications of Dr. A. Gray on their own flora, or on that of various countries visited by their expeditions or collectors, remain incomplete, or are only continued in abridged notices in Proceedings of some of their Societies. I feel sure that every lover of science will join in the fervent wish that our gifted cousins may soon turn from scenes of bloodshed, and again devote themselves to the cultivation of the arts of peace and progress.

In South America there are two States whose comparative tranquillity has enabled their Governments to pay some attention to the calls of science. The vast empire of Brazil is in a state of progress. Rio Janeiro has her Vellozian Society of Natural History, whose secretary, Dr. Capanema, has recently returned from accompanying as Naturalist an expedition for the investigation of the resources of several of the tropical districts; and it is chiefly the support of the Brazilian Government that enables Dr. v. Martius to continue the elaborate

Flora Brasiliensis which he edits. Of this costly work the parts published within the last twelvemonth comprise *Celastrineæ*, *Ilicineæ* and *Rhamnææ*, by Dr. Reissek, *Scrophularineæ*, by Dr. J. Schmidt, and *Dalbergiææ* and *Sophoreææ*, completing my *Papilionaceææ*. Chile has also distinguished herself in Natural History. The Flora Chilena, completed at Paris a few years since for the Chilian Government by M. Claude Gay, has been followed by various papers by Dr. Philippi, Professor of Zoology and Botany in the University of Santiago, and Director of a Museum which he appears almost to have founded there. Amongst these, his Travels in, and Flora and Fauna of the Desert of Atacames, which, although published in Germany, was written at Santiago, deserves especial notice. The flora of the remainder of South America is only known from the collections of travellers published in Europe, amongst which M. Weddell has completed the second volume of his valuable *Chloris Andina*, and Karsten the first of his *Flora Columbiana*. The latter, however, is not a Flora in the ordinary sense of the word, but a selection of new and little-known species, splendidly illustrated. It is only to be regretted that the beautifully executed and accurate analyses and careful descriptions should not have been accompanied by a little more literary research, for the proportion of already known genera or species given as new is greater than might have been expected. We had hoped also, ere this, to have had the first volume of Planchon and Triana's *Flora of New Granada*; but the promised aid on the part of the Government of that country has been delayed, although I trust not definitively stopped, by domestic revolutions.

Under the head of Faunas and Floras I would add a few words on the subject of illustrations of the results of scientific exploring expeditions. In these expeditions, undertaken at great cost, the labours of the zoological and botanical collectors who accompany them are often most liberally encouraged, and on their return home funds are supplied for the publication of the results, but not unfrequently upon terms which interfere much with their practical utility. It would seem as if the object were not so much to add to our knowledge of the productions of the countries visited, as to make a vain boast of the number of new genera or species discovered, or of the specimens collected. It is seldom that in these great expeditions there are not some countries more completely explored than had ever been previously the case, and whose faunas and floras, if rendered complete up to the present state of science, are great desiderata, whilst specimens gathered during a few days' stay at some

well-known port cannot be of much interest except to the collectors themselves. Take, for instance, the great United States Exploring Expedition under Captain Wilkes. Rich collections were made in the two comparatively little-known groups of the Sandwich and the Fiji Islands, both of them remarkable for the peculiarities of their vegetation, and complete Floras of these groups, such as the distinguished botanist entrusted with the Botany of the Expedition would have drawn up, had his advice been followed, would have been important contributions to science. In lieu of this, we have the commencement of a work far too splendid in typography and illustration to be within reach of many botanists, never likely to be finished, and in which a large space of the text is occupied by an enumeration of some of the commonest plants picked up at Rio Janeiro, Port Jackson, the Cape of Good Hope, and other well-known ports. Professor Gray's short memoir above mentioned, on the Botany of Japan, one of the results of a subsequent expedition under Captain Ringgold, has contributed far more to the advancement of science than the pretentious volume insisted on by Captain Wilkes. Again, the Botany of Prince Waldemar's Journey in the Himalaya, by the late Dr. Klotzsch and Dr. Garcke, which has just appeared, is an instance of a costly work of little use beyond showing off the herborizations made under princely auspices. The number of species collected is very small compared with the rich stores from the same country long since distributed among the principal herbaria of Europe, and full half of what are given as new are identical with or slight varieties of well-known plants. On the other hand, we may well be proud of the results of our own Antarctic Expedition in the three splendid and complete Floras of Dr. Hooker, treated in the manner most conducive to the progress of science, without any attempt to give prominence to the author's own labours. It is to be hoped that such Faunas and Floras of places specially visited, such as the Nicobar Islands, will form a prominent feature in the forthcoming Zoologies and Botany of the Austrian Novara Expedition.

The details into which I have been led, with reference to my own special subject of Systematic and Descriptive Botany, leave me no time to advert to recent works on Physiology, which, taken in its largest sense, is that important part of the study of nature for which systems and descriptions are but the means. There is, however, one branch, that which I have above termed Biology, upon which I should wish to say a few words, in order to call the attention of our Fellows resident in the country to a field of inquiry comparatively untrodden, and upon which any series of carefully con-

ducted observations would be of the greatest interest both at our meetings and in our publications. The remarkable success which has attended the long-continued, persevering and well-combined observations of Mr. Darwin should stimulate others to follow in the same track; and much as he has disclosed, much as he has still in store for us, his every page shows how far even he is yet from having exhausted the subject. I do not refer to those speculations on the origin of species, which have excited so much controversy; for the discussion of that question, when considered only with reference to the comparative plausibility of opposite hypotheses, is beyond the province of our Society. Attempts to bring it forward at our meetings were very judiciously checked by my predecessor in this Chair, and I certainly should be sorry to see our time taken up by theoretical arguments not accompanied by the disclosure of new facts or observations. But we must all admire that patient study of the habits of life, with that great power of combining facts, which has revealed to us so much of surprising novelty in the economy of nature. The wonderful contrivances for the cross-fertilization of Orchids, so graphically detailed in Mr. Darwin's new work, and which rival all that had been previously observed in the singular economy of insect life, had been hitherto unsuspected even by those botanists who had specially devoted themselves to that family. And this is but a sample of that extraordinary variety of facts collected by him and brought to bear upon his theories, which must be patent to every impartial reader of his works, whilst all who have had an opportunity of watching his *modus operandi* are well aware that he never brings forward an observation without taking every precaution to ensure its accuracy, thoroughly sifting every circumstance that appears to militate against it. It is indeed to be hoped that, without waiting for the completion of the great work that is to embody the whole series of his *pièces justificatives*, Mr. Darwin will continue to illustrate separate portions of his subject, each one of which is sufficient to give a lasting name to its author. In the meantime let every lover of nature who, from his residence in the country, may have leisure and opportunities of observing, follow in the track thus opened out. If he will carefully watch the gradual development and daily habits, at all seasons of the year, of the animal or vegetable productions which are around him in the greatest abundance, he will detect many a curious arrangement by which nature, in causing animals and plants, or different species of each, to act and react on each other, provides for the perpetuation of species, races,

or individual varieties, against the ever-present causes of destruction, and at the same time checks that over-multiplication which might result from those very provisions. Those sudden appearances of myriads of insects known in rural districts under the name of blight, their enormous means of multiplication, and their almost total disappearance the following season are as yet a mystery to us, both as to their cause and their influences. The perusal of Mr. Darwin's first chapters will show that there is much still to ascertain in the action of insects even on our common Orchids; and how little do we know of the real history of the life of those sets of plants upon whose external forms volumes have been published! How is it that when our hedges are annually loaded with the fruit of the bramble, or our fields covered with the down of *Carduus arvensis*, we seldom see a seedling of the one or the other?—nature having concurrently provided for their propagation by the inarching and rooting stems of the former and the creeping rhizomes of the latter. How is it that in many localities every individual *Epilobium montanum*, before it dies down in the autumn, has surrounded itself not only by numerous offshoots, each one armed against the rigours of winter so as to form an independent new plant in the spring, but also by a wide-spreading progeny already born from the hundreds or even thousands of seeds it has shed; and yet when we examine the same spot the following year, the number of *Epilobiums* has not increased, and you may look long before you find among them a single seedling, every individual you uproot proving to be the result of a previous year's offshoot? In this excessive multiplication of autumn seedlings have we perchance a provision in aid of insect or other animal life—something analogous to that concurrence of natural causes, which at one of your last year's meetings was described as insect horticulture? We usually close our observation of living plants in October, and recommence it in March, when in many respects a total change has taken place: the gradual progress of that change remains to be watched. I am well aware that numerous papers on the life and development of plants have been published, more especially in French and German periodicals, and must be consulted by observers before they can safely draw any conclusion; but many of these treat the subject solely with a view to specific distinction, and scarcely ever in relation to habits induced by external influences of station and climate, still less with reference to that connexion with insect life revealed by Mr. Darwin. We have had enough of splitting of hairs and counting of spots, and of idle controversies as to whether

they indicate species, varieties, or individual differences. Let us adopt for the insects and plants of our islands the nomenclature and classification the most convenient for study, and devote our attention to their economy and development, to the complicated structures disclosed by the microscope, and to those innumerable influences which we term accidental, but which appear all to form part of one general plan for the balance of power in the natural world. If, at this time next year, I am still honoured by a seat in this Chair, I hope to lay before you a sketch of the state of those branches of our studies which I have now been unable to touch upon; and it will be a matter of great gratification to me, if I have to report that many a Fellow of the Society may have taken a leaf out of Mr. Darwin's book, and commenced a series of observations on some of the subjects I have alluded to.

OBITUARY NOTICES.

The Secretary then read the following Notices of deceased *Honorary Members, Fellows, Foreign Members, and Associates.*

Of the three illustrious names enrolled as *Honorary Members* of this Society, we have to lament the loss of two within the last twelvemonth, both in the prime of life, and both more than usually distinguished, not only for their sincere and earnest endeavours to promote the cause of science, but also for their extensive knowledge and liberal minds.

Of his late ROYAL HIGHNESS THE PRINCE CONSORT, whose death we have all so deeply mourned, and whose memory will ever be so dear to the community he loved to serve, it is scarcely necessary on the present occasion to say more than that we, as a scientific body, have in him more especially to lament the loss of one who at all times evinced the most earnest desire to promote science, and was enabled to do so from his wide-spread acquaintance with almost every branch of it.

The memory of his MAJESTY DON PEDRO V., King of Portugal, demands more than a mere passing notice. Irrespective of his exalted station, his individual character as an earnest worker and munificent patron of science, and more especially of natural history, requires that I should offer some account of his brief but useful career.

Though many monarchs have deservedly been known as the

patrons and promoters of science, there are few who can themselves be justly placed on its rolls. But it was not so with the late King of Portugal, who was distinguished not only for the enlightened and discriminating encouragement he afforded to science in all its branches, but was also himself no mean proficient in many of them.

He was born in Lisbon on the 16th of September, 1837, the eldest son of Donna Maria II., on whose death he ascended the throne, in his seventeenth year, on the 15th of November, 1853. In May 1858 he married the Princess Stephanie of Hohenzollern-Sigmaringen, but had the misfortune to lose his consort in the following year. The uncertain and often unfortunate circumstances, domestic or political, by which his early years were saddened, the unhappy loss of his young wife, and the misfortunes from epidemic disease and political commotions with which his short reign was afflicted and disturbed, all contributed to give his character a tinge of melancholy and sadness; although at the same time the trials through which he passed served to bring out into stronger relief, the amiable, kind, and considerate disposition with which he was naturally endowed. On ascending the throne, one of the first tasks he undertook was to make himself acquainted with his country and his people, and with this view he was yearly in the habit of journeying into the various provinces of the kingdom, in one of which expeditions he may be said to have fallen a victim to this self-imposed duty, being attacked, soon after his return from the province of Alemtejo, by a fever which carried him off on the 11th of November, 1861,—two of his brothers, Don Fernando and Don João, being also struck down by the same malady.

Don Pedro had received a careful and liberal education, and of course, from his exalted position, enjoyed unusual opportunities for the acquirement of knowledge. But it was mainly to his own talents, zeal, and industry, after he had reached man's estate, that he was indebted for the vast amount of accurate knowledge he was generally acknowledged to possess.

From an early age he exhibited a strong inclination for the study of natural history, in which he was also much encouraged by his father, Don Fernando, himself distinguished as an artist and man of science. While still Crown Prince, he founded a Museum of Natural History in the Palace of Necessidades, and in all his travels, both at home and abroad, he lost no opportunity of adding to the stores of his Museum, or of his extensive Library of Natural History. He was also much attached to the society and correspondence of men

of science of all nations, and thus kept himself well acquainted with the progress of knowledge throughout the world.

In natural history he devoted most attention to conchology and ornithology, in both of which departments his Museum was very rich, including, in particular, an almost complete collection of the birds of Portugal, nearly all procured and classified by himself; and in 1861 he published a "List of about 200 Species of Portuguese Birds," in the 'Gazeta Medica de Lisboa.' But, not content with the limits of his own dominions, he aimed at the collection of typical specimens of all exòtic *genera* of birds and shells; and his Museum, in consequence, in late years was enriched with most of the typical forms of birds, procured, regardless of cost or trouble, from all parts, and illustrated by all the more valuable works relating to ornithology.

But, besides these efforts in the cause of science, his brief reign will long be remembered from the constant endeavours he manifested to improve in all ways the well-being and intellectual improvement of his people, and prove himself in every respect worthy of the eminent post to which Providence had called him.

Edward Barnard, Esq., F.R.H.S., was born on the 14th of March, 1786, and became a Fellow of the Linnean Society on the 17th of February, 1818. He was educated at Eton, which school he left in 1804, when he entered the Colonial Office, an employment in which he continued during the remainder of his life. In 1825 he was appointed by Lord Liverpool to the office of Agent-General for the Crown Colonies.

Mr. Barnard was devoted principally to horticultural pursuits, and was for many years a Fellow and Member of Council of the Horticultural Society, at whose Meetings* he contributed several communications or notices with reference to the cultivation of certain flowers. The singular plant, *Ammobium alatum*, R. Br., is stated to have been raised, in 1822, from seeds transmitted from New South Wales, and presented to the Society by Mr. Barnard. He was also one of the original Fellows of the Zoological Society, and gave much valuable assistance in the laying out of the gardens both of that Society in the Regent's Park and of the Horticultural Society at Chiswick.

He died suddenly of an apoplectic attack on the 13th of December, 1861.

William Borrer, Esq., was born at Henfield, in the county of Sussex, on the 13th of June, 1781, and was the eldest son of

* They are not *published*, but very briefly *noticed*, in the 'Transactions.'

William Borrer, Esq., who was at that time residing there; but shortly after the birth of his son, he removed to Hurstpierpoint, only a few miles distant.

The education of the subject of this notice was there commenced, at a mixed school, where he showed great industry and perseverance, and made rapid progress in his studies.

At the age of 13 or 14 he was removed to a school at Carshalton, in Surrey, conducted by Mr. John Morphew, a man of sound religious principles, with which he thoroughly imbued his pupil, and thus laid the foundation of that piety and uprightness for which in after-life Mr. Borrer was particularly distinguished.

At this school he continued little more than one year, and then returned to his home. This appears to have been the only portion of his education during which he received any assistance from others; but being exceedingly fond of reading, and of a very studious disposition, he neglected no opportunity of improving his mind, and he eventually became not only a most deeply-read divine, but also attained no mean proficiency in French and Latin, as well as in Greek, which latter language, from some prejudice, he was forbidden by his grandfather to be taught at school.

His father at this time wished him to become a farmer, like himself; but his own desire was to commence life as a physician; and these discordant views neutralized each other; so that though his father gave him a farm, and guaranteed him against loss, he did not succeed in raising in his son any desire of devoting himself to agriculture.

Mr. Borrer was now frequently, and often very arduously, engaged in carrying on business for his father, who was very profitably employed in contracts for the supply of hay, corn, &c., for the use of the large body of troops at that time stationed at Lewes, Brighton, and other portions of the south coast.

In the course of the transaction of business of this nature, Mr. Borrer, performing all his journeys on horseback, devoted his attention especially to the natural productions of those districts; and, wherever his father's engagements might lead him, he never neglected any opportunity of collecting, examining, and preserving all attainable specimens.

To this study he had, in fact, a bent from his earliest years; and his brother, Mr. John Borrer of Portslade, who was only some two years his junior, states that he does not remember the time when he was not enthusiastic in his love for flowers, and in his admiration of

the vegetable world in general; so that there was no muddy ditch, no old wall, no stock of a tree, no rock or dell, no pool of water or bay of the sea that did not add to his delight, nor open to him a wide field for investigation or enjoyment.

Mr. Borrer received his earliest encouragement in his favourite pursuit from one or two of the officers of a camp which had been formed near his father's house, and who passed much of their leisure time in his company.

The 'English Botany' is a work in which he took, from the first, the highest interest, and he would frequently ride to Lewes to get the number a day sooner than he could otherwise have obtained it.

Being always of a very studious habit and of great energy and perseverance, he soon raised himself to considerable eminence in the botanical world, and had early in life a large botanical correspondence, though, being naturally fond of retirement, he never sought what is called society for its own sake.

The greatest encouragement in his botanical pursuits was afterwards derived from his acquaintance with Dawson Turner, Esq., with whom he spent much of his time, and corresponded for many years, and who introduced him to the present Sir W. J. Hooker, with whom, as with Joseph Woods, Esq., and the late Edward Forster, he formed an intimacy and friendship which remained undisturbed for more than half a century.

At the age of twenty-nine he married the eldest daughter of N. Hall, Esq., at that time a banker in Brighton, when he went to live in a house built for him by his father at Henfield.

In 1805, Mr. Borrer became a Fellow of the Linnean Society. He was also a member of the Royal Society and of the Wernerian Natural History Society of Edinburgh. He was for many years in the commission of the peace for the county of Sussex, though he never took an active part in public business.

In 1810 he was engaged, in company with Sir W. J. Hooker, in a botanical tour in Scotland; and at another period he visited Normandy with a similar object. Of these tours he has left no record, and, with this one exception, his investigations were confined to the British Isles.

In carrying out his botanical researches, Mr. Borrer showed great energy, being for many years, when informed of the discovery of a new plant, in the habit of personally visiting its site. On some occasions, having observed plants whilst travelling by rail, he has stopped at the next station and proceeded to the spot by post. In

this manner he discovered *Barbarea stricta*, between Sheffield and Halifax. To his quick discrimination, also, the British Flora is indebted, I believe, for *Leersia oryzoïdes*, which, first noticed by him in the Henfield Levels, has since been found abundantly at other places in Sussex and Hampshire. Another interesting plant, *Isnardia palustris*, was also first noticed by him as a British native in 1827, in a pool at Buxtead, Sussex.

While thus successful and sharp-sighted himself, he was, moreover, equally skilful in testing the alleged discoveries of others. A Westmoreland "guide," in the Lake District, had represented that he had discovered, in that locality, a habitat for *Cypripedium Calceolus*; but Mr. Borrer, doubting the correctness of the statement, was at pains to visit the spot for three years successively, at the time of flowering of the plant, and was at length able to expose the attempted imposition.

Zealous and able botanist as he was, Mr. Borrer published scarcely anything under his own name or in a separate form. He was, however, a constant contributor to science in other ways, and especially in the Supplement to 'English Botany.' The Lichens throughout that work were very generally described by him, as were also most of the *Salices*, *Rubi*, and *Roses*, to which genera he had paid particular attention; and in the preface to the 'British Flora,' Sir W. J. Hooker acknowledges his great obligations to Mr. Borrer, more particularly for a complete revision of the genera *Myosotis*, *Rosa*, and *Rubus*.

The only other separate work, as it would seem, under his name, and then not alone, was commenced and partially carried out by him, in conjunction with Mr. Dawson Turner, in the year 1813, although its publication, partly owing to the death and derangement in the affairs of the publisher, was delayed till 1839. The work, modestly entitled 'An Attempt at a History of the British Lichens,' was even then brought out by his coadjutor, Mr. Turner, for private circulation only, that gentleman's object being (to quote his words in an introductory letter to Mr. Borrer), "that it may remain a monument of your industry, your ability, and your profound knowledge of the family of Lichens." And the dedication, which is also addressed to Mr. Borrer, commences in the following affecting terms:—

"More than twenty-six years have now gone by, since you and I, warm with the hopes of youth, and sanguine in its projects, wrote and printed the contents of this little volume. That its progress was thus interrupted, and that we stopped in the vestibule of our

inquiries, was unquestionably owing, in a certain degree, to circumstances, but was, I fear, principally my fault. I own, with regret, that the cause lay too much in fickleness of pursuit on my part, unfortunately seconded by an unwarrantable modesty and distrust of yourself on yours."

Mr. Borrer's extensive and valuable collections of plants, as well as the ample stores of his exact knowledge, were always at the service of his friends and fellow-labourers. His garden also, which he began to form immediately on being established in premises of his own, gradually increased till it became one of the best, if not the very best collection in this country, of living plants which are capable of bearing its climate. In the autumn of 1860, his gardener, Charles Green, who, under Mr. Borrer's tuition, had acquired considerable proficiency in botany, gave a list of 6660 plants contained in it; and amongst them were above 1000 annuals, a class which, owing to the constant attention required in collecting the seeds, is seldom cultivated to so great an extent.

But beyond Mr. Borrer's claims to remembrance as a patron and ardent promoter in his own person of botanical and the kindred sciences, his memory will by many be more warmly cherished in his own locality, from his numerous and unostentatious charities, and his zealous endeavours to promote the welfare and best interests of all with whom he was connected; and the poor always came to him as to a friend. He paid especial attention to the moral and religious advancement of his own parish, in which he was mainly instrumental in increasing the stipend of the incumbent; making also, at his own expense, large additions to the parish church, for the better accommodation of the school-children and of his own cottagers. For many years he attended with great interest to the National School, which was established principally by his exertions; and he also built on his own land a school for girls, and another for infants. Besides these attentions, he generally assembled, at his own house, three or four lads at a time, whom he educated himself for whatever business they might be disposed to choose; and these he afterwards apprenticed or placed in various situations; and there are many, whom he continued to watch over with what may be truly called a fatherly care, now in active business, and esteemed as ornaments to the community.

By his own brothers, who by their situation were most intimately acquainted with his early life, he has been described as remarkable for his clear-sightedness in business, his high sense of religion, his intense abhorrence of anything approaching to vice or immo-

rality, and by his constant readiness to promote, by pecuniary assistance or by friendly advice, the advancement of all deserving applicants.

Up to the year 1851, Mr. Borrer had enjoyed the full vigour of an excellent constitution; but in that year he had a violent attack of illness, and though he sufficiently rallied even to enjoy several botanical excursions, he was from that time liable to frequent attacks of extreme debility. Yet he continued to take as much interest as ever in his garden and botanical collections, and was still, as through life, remarkable for his extreme accuracy and simplicity of style, whether in telling an anecdote or in describing a plant.

At Christmas 1861, he attended the annual distribution of prizes at the Henfield National School, in returning from which he took a severe cold, resulting in pleurisy, from the effects of which he died, peacefully and calmly as he had lived, on the 10th of January, 1862, in the 81st year of his age, deeply and deservedly lamented by his own numerous family, and by all who knew him.

George Charlwood, Esq., was formerly an eminent and much respected seedsman in Covent Garden. He was elected into the Linnean Society on the 16th of March, 1824, and died August 26, 1861, at Feltham, where he had long resided, aged 77.

Albert John Hambrough, Esq., who died at 14 Prince's Terrace, Hyde Park, on the 6th June, of 1861, in his 41st year, had been but a few years a Fellow of this Society, having been elected only in February 1856. His usual residence was Steephill Castle, in the Isle of Wight, and he was well known as a zealous cultivator of the island flora.

The Rev. Frederick W. Hope, D.C.L., F.R.S., &c., died on the 15th of April, 1862, at his house, 37 Upper Seymour Street, Portman Square. He was born on the 3rd of January, 1797, in the same house, being the second son of John Thomas Hope, Esq.

Entering Christchurch, Oxford, he graduated B.A. in 1820, and took his M.A. degree in 1823, and was ordained to the curacy of the family living of Frodesley, Shropshire, but his health did not long permit him to perform the duties of his profession.

During his residence at Oxford, he devoted his leisure hours to the study of zoology, and especially of entomology, with great zeal. To this study he was much incited by the precepts and example of Dr. Kidd, who was at that time Regius Professor of Medicine, and whose lessons on zoological subjects strongly fostered the growing taste of the young student, who, throughout his future career, looked up to his teacher with kind feelings of regard, which were testified

by his donation to the University Museum of a portrait of Dr. Kidd.

On leaving college, Mr. Hope pursued his zoological studies with great earnestness, not confining his attention to insects only (which, however, subsequently became his more especial favourites), but extending it to every branch of English animated nature, of which sufficient proofs appear in various notices in Mr. Yarrell's volumes on 'British Birds and Fishes.' His success as a collector of British insects was very great; and the extent of his collections, as well as the readiness with which he granted access to them to all persons engaged upon special works on various families, genera, &c., is abundantly testified by the constant reference made to them in Mr. Stephens's great work on English insects in general, commenced in 1828, in Gravenhorst's '*Ichneumonologia Europæa*,' 1829, and in Gory's great works on the *Cetoniadæ* and *Buprestidæ*. Mr. Hope, however, did not limit himself to English insects, but formed, at great expense, a very extensive exotic collection, which became famous on the Continent for the numerous Indian, African, and Australian rarities which he had succeeded in amassing.

On March 5th, 1822, he was elected a Fellow of the Linnean Society. He took an active part in the formation of the Zoological Society in 1826, and of the Entomological in 1833, and in both these societies he continued to take a warm and active interest. In 1835 he succeeded the late Mr. Children as President of the latter Society, which office he held for two years, the time limited by the bye-laws. His contributions to these different societies were very numerous. In these papers it may be remarked that his attention was not confined to the technical description of the numerous new species of insects contained in his collection, but that his inquiries were extended to many practical points in their economy, such as the supply of silk, the parasitism of insects in Man, the investigation of the insects mentioned in the Holy Scriptures, their ravages on growing wheat, &c., and on the submarine wooden constructions of our harbours, &c. He also published, in 1837-40, a separate work on Coleopterous Insects, in 3 vols. 8vo.

During the last twenty-two years of his life the state of his health required his residence, for a considerable portion of each year, in the warmer parts of Europe; and at Naples and Nice he continued his investigations, especially on the marine productions of those localities, forming large collections of fishes, Crustacea, &c., as well as of birds and shells. Being desirous of keeping these large collections entire, and actuated by a strong devotion to his *alma mater*, in

the year 1849 he executed a deed of gift, making over his whole collection, as well as his library of books and engravings, to the University of Oxford, under certain conditions of a very liberal character, with reference to their being rendered available for promoting the study of natural history at Oxford. He still, however, continued annually to make large additions to the stores which he had thus assigned to the University. Thus in 1857 he secured the whole of Mr. Westwood's collections of insects, books, and drawings; and subsequently he acquired Mr. Wollaston's second and greatly enlarged collection of Madeira insects, the collection of Orkney birds formed by Mr. Hubbard during many years' residence in those islands (unrivalled for the beauty of the specimens and the various groups of young birds, with their parents and nests), as well as the Bell collection of reptiles. By this means the University now possesses a collection of insects inferior only in extent to those in the national museums of London, Berlin, and Paris, and an entomological library unrivalled both in the number and rarity of its contents.

Mr. Hope's bounty, however, was not confined to natural history, since his donations to the University of Oxford comprise one of the largest collections of engraved portraits and topographical illustrations ever formed, together with several thousand volumes of biographical, historical, topographical, and fine-art works, voyages, travels, &c., including the Jussieu collection of Academic Éloges, illustrating the collection of engravings, which cannot be considered as amounting, at the lowest estimate, to fewer than 200,000. Of these, the portraits cannot be fewer than 100,000, the topographical engravings from 60,000 to 70,000, and the natural-history engravings from 20,000 to 30,000. There is, moreover, a considerable number of engravings of a more miscellaneous character, including many by the old masters.

Mr. Hope's latest donation to the University consisted of the remarkable collection of the works of British Essayists formed by his father, consisting of about 1200 volumes, many of the greatest rarity.

In the year 1855 the first stone of the new Oxford Museum was laid, on which occasion the honorary degree of D.C.L. was conferred on Mr. Hope, whose various munificent donations were destined to be there deposited.

In 1861 Mr. Hope further testified his devotion to the University of Oxford by founding and endowing a Professorship of Geology, with more especial reference to the Invertebrata, to which chair he nominated our distinguished colleague, Mr. Westwood, as the first

Professor ; and it is understood that he has also made provision for the endowment of a keepership for the engravings, as well as for annual additions both to his entomological and art-collections.

Robert Charles Hurst, Esq., M.R.C.S.E., was a medical practitioner at Bedford. He was elected into the Society on the 17th January, 1861, and died almost on the anniversary of his election, on the 16th January last, at a comparatively early age.

John Thomas Quekett, Esq., F.R.S., was the fourth son of the Head Master of the Langport Grammar School, where he received his elementary education. At the early age of sixteen he showed the bent of his mind, and an earnest of his future eminence as a microscopist and zealous cultivator of science, by giving a course of lectures on microscopic subjects, illustrated by diagrams and a microscope of his own construction, the materials of this instrument being furnished by a common roasting-jack, a lady's old-fashioned parasol, and some pieces of brass purchased at a neighbouring marine-store shop, and fashioned by himself. He afterwards repaired to London and was apprenticed to his brother, the late Edwin Quekett, who was at that time Lecturer on Botany at the London Hospital Medical School ; and at this institution he was also entered a student. On the due completion of his studies, he became a Licentiate of the Apothecaries' Company and Member of the Royal College of Surgeons. The College having just then established a studentship in human and comparative anatomy, Mr. Quekett competed for the appointment, and was unanimously elected ; and he immediately set to work and formed a most extensive and valuable collection of microscopic preparations, which was afterwards purchased by the Council of the College, where it forms the chief part of the "Histological Series of the Museum"—a collection consisting of preparations of the elementary tissues, both healthy and morbid, of animals and plants, adapted to illustrate the results and uses of microscopical investigation.

In 1844, in pursuance of the object the college had in view in acquiring this valuable collection, Mr. Quekett was appointed to deliver an annual course of demonstrations with a view to its exhibition and connected description. A descriptive and illustrated catalogue of the collection, subsequently prepared by Mr. Quekett, under the superintendance of the Museum Committee, and of which the first volume was published in 1850, forms a striking monument of his unwearied industry and great skill as a histologist and microscopist.

At the conclusion of the period for which the studentship was tenable, viz. three years, Mr. Quekett was appointed Assistant Con-

servator of the Hunterian Museum; and on the retirement of Professor Owen, he was elected to succeed him as curator, and was also, as above stated, named professor of histology—appointments which he held at the time of his death. He was elected into the Linnean Society on the 17th March, 1857; and died at Pangbourne, in Berkshire, on the 20th August, 1861, at the early age of 46.

Thomas Haswell Quigley, M.D., was a surgeon in the Royal Artillery. He was elected into the Society, November 20, 1821, and died June 14, 1861, at his residence, Mount Pleasant Square, Dublin.

Sir James Clark Ross, F.R.S., F.R.A.S., F.G.S., &c., was born in London in the year 1800. In 1812 he was entered as a midshipman on board the 'Briseis,' commanded by his uncle Sir John Ross, the well-known Arctic navigator, and whom he accompanied on his first voyage to the Polar Seas in 1818. Between 1819 and 1827 he returned four times to the same regions, under the orders of Sir Edward Parry, by whom he was highly esteemed as a zealous and efficient officer. In the latter year he was raised to the rank of commander.

In different voyages to the Arctic Seas, again under the command of his uncle, between 1829 and 1833, the scientific observations were committed principally to his charge, and he was also repeatedly placed at the head of expeditions sent out from the ice-locked ship for the exploration of the surrounding country. In the course of these expeditions he made the discovery of the north magnetic pole in $70^{\circ} 7' N.$ and $45^{\circ} 9' E.$ In 1834 he attained the rank of captain, and in the following year commanded an expedition in search of several whalers which had been caught in the ice in Baffin's Bay.

From 1836 to 1838 Sir James Ross was employed by the Admiralty in the determination of the points of magnetic deviation and declination in Great Britain and Ireland—labours which have served as the basis upon which were founded the isodynamic lines in the charts published by General Sabine. In 1839 he took the command of a scientific expedition sent out, at the suggestion of the Royal Society, to explore the Antarctic regions. Three times did he endeavour to break through the icy barrier which surrounds the Antarctic pole, but in vain, as he was unable to advance beyond the latitude of $78^{\circ} 10' S.$, a limit, however, which has not been since surpassed in that direction, and had not previously been reached.

In this voyage, also, was discovered the great Antarctic continent of Victoria Land, distinguished by the existence of a volcano 3800

feet in height. The voyage lasted four years, and was fertile in observations of all kinds, amongst which, not the least important are those of Sir James Ross himself in terrestrial magnetism and meteorology, &c. Its results were published by himself in 1847.

His last voyage to the Polar Seas was in 1848, when he went unsuccessfully in search of Sir John Franklin. He was knighted in 1844, and received the decoration of the Legion of Honour from Louis Philippe. He became a Fellow of this Society February 3, 1824; and died April 3, 1862, aged 62.

Andrew Sinclair, M.D., was a surgeon in the Royal Navy. He entered the service about the year 1824, and was promoted to surgeon's rank in 1829. He was appointed surgeon of the surveying-expedition of H.M.S. 'Sulphur' on the Pacific coasts of North and South America, under the command, first, of Captain Beechey, and afterwards of Sir Edward Belcher, and has long been favourably known in botanical circles from the collections he then formed, and an account of which has been published, partly in the Supplement to Hooker and Arnott's 'Botany of Beechey's Voyage,' and partly in Bentham's 'Botany of the Voyage of the 'Sulphur.' In 1842 he was employed as surgeon of a convict-ship, and visited several Australian ports, collecting diligently everywhere. From Australia he went to New Zealand for the purpose of spending some weeks with the Antarctic Expedition, in which his friend Dr. Hooker was then doing the duty of Naturalist. During a second voyage to Australia in the same capacity, he met with Captain (now Admiral) Fitzroy, who was on his way to New Zealand as Governor, and who took Dr. Sinclair on with him as his private secretary.

Not long after his arrival he succeeded to the post of Colonial Secretary, which he retained during the governments of Captain Fitzroy, Sir George Grey, and Colonel Brown. During all this period his delight was in botany, to which his leisure was almost entirely devoted, although he still found time also to make considerable and valuable collections, more especially of Sponges and Zoophytes.

On the establishment of parliamentary government in New Zealand, Dr. Sinclair visited England, and soon after received a pension from the colony. But being still bent on the exploration of his favourite island, and being especially desirous to collect materials from the Middle and Southern Islands for a Supplement to Dr. Hooker's 'Flora,' he returned in 1859. After several months' sojourn in Auckland and in Nelson, he latterly repaired to Canterbury, and made arrangements with Mr. Haast for visiting Mount Cook, with

the intention of crossing the glacier-bound central range to the west coast—an arduous journey for a man at his age, but one of the most interesting, geographically, geologically, and botanically, that could be undertaken in New Zealand. From this he was destined never to return. The intelligence of his death was first received from his companion Dr. Haast, the geologist to the party, and afterwards, in more detail, from his old and attached friend and fellow-botanist, C. Knight, Esq., F.L.S., of Auckland. He was drowned in an imprudent attempt to cross the swollen Raugitata River on foot, at a ford where the stream is divided by an island. Dr. Sinclair appears to have crossed with his horse to the island; but the animal having there escaped from him, he proceeded on foot into the second branch, when, the current proving too strong, he was carried down; and the body was discovered, some time afterwards, lying on a spit of sand.

Thus was lost a valuable friend to science and a most amiable and excellent man. He was remarkable for shrewdness of character, ardent love of knowledge, readiness in communicating it, and as an assiduous collector of plants and animals. He made no pretensions to a knowledge of scientific subjects, though he read largely and often observed well. Of ancient and modern history and *belles lettres* he was extremely fond, and on these subjects his stores of information were both varied and great. He had a keen relish for society, great love of music and art, and was a most engaging companion in the bush or at sea, and to old or young in the drawing-room or school-room. He was never married; but many will mourn his loss, as that of a most judicious, disinterested, and warm-hearted friend; and his name will ever be prominent as one of the pioneers of botanical discovery on the Pacific coasts of America and in New Zealand, and as the active promoter of all branches of science in that colony.

Joseph Sheldon Cradock Wilkinson, Esq., M.R.C.S.Eng., was a medical practitioner at Great Marlow, Bucks. He was elected into the Society on the 7th February, 1837, and died at the age of 52, on the 18th of June, 1861.

FOREIGN MEMBERS.

Charles Louis Blume, M.D., was born at Leyden in the year 1796. He was educated for the medical profession, and, soon after taking his degree, proceeded to Java, where he had the principal medical charge of the colony, and, on the retirement of Reinwardt in 1823, was made Superintendent of the Botanic Garden at Buitenzorg. About the same time he was specially directed by the en-

lightened Governor, Baron van der Capellan, to inquire into the remedies in use among the natives, with a view to the introduction of such as might prove available into the European Pharmacopœias.

Having been thus induced to turn his attention more particularly towards botany, he soon became so entirely devoted to its pursuit, that all the time he could spare from his professional duties was occupied in the investigation of the plants of the country, of which, with the assistance of some European fellow-labourers and of native collectors, he amassed in a few years about 3000 species.

In the year 1824, while on a visit to Nusa Kambangan (a peculiarly unhealthy island on the south coast of Java), he lost nearly all his companions, and was himself brought to the point of death by a violent attack of fever, the frequent recurrence of which for some years afterwards very seriously affected his health. Nevertheless he worked continually at the publication of his botanical discoveries, commencing in 1823 with a Catalogue of the Botanic Garden at Buitenzorg, and several Memoirs in the 'Batavian Transactions,' and following these up with a far more important work under the title of 'Bijdragen tot de Flora van Nederlandsche Indie,' published at Batavia in seventeen fasciculi, during the years 1825 and 1826.

It may naturally be supposed that, with the small assistance from books which could be obtained at that time in Java, numerous errors would occur in the determination of the multitude of species described in this valuable work, many of which the author himself afterwards took occasion to correct. But the wonder is, that under such unfavourable circumstances so extensive a work could have been produced with no greater or graver errors. In the year 1826, his health still continuing to suffer greatly from periodical attacks of fever, he returned to Europe, and immediately commenced an 'Enumeratio Plantarum Javæ et Insularum adjacentium,' of which two fasciculi (the first containing the Ferns and allied orders) appeared in 1827 and 1828. In the latter year, having obtained a liberal allowance from the King of the Netherlands, he greatly enlarged his plan, and began the publication of a splendid work in folio, illustrated with coloured plates, entitled 'Flora Javæ et Insularum adjacentium,' of which forty fasciculi, containing many of the most important families, appeared during that and several subsequent years. On the suspension of this work, the author proceeded with another, on a nearly similar plan and, like the former, supported by royal munificence, under the name of 'Rumphia,' a title suggested by the designation given to him in 1818, on his election into the Academia Naturæ Curiosorum. Of

this work also forty fasciculi, forming four volumes, were published during the years 1834–1848. The last of this extensive series of works on the Flora of the Dutch possessions in India was commenced in 1849, under the title of ‘Museum Botanicum Lugduno-Batavum,’ and continued at intervals until 1856.

Numerous minor publications occupied the intervals of these greater labours, and serve to evince how indefatigably the author laboured in the pursuit of his favourite science.

He died, after a prolonged illness, on the 3rd of February in the present year, in the 66th year of his age.

After his return to Europe, he became Professor of Botany and Director of the Royal Botanic Garden at Leyden, and received several orders of knighthood from his own and other Sovereigns. He was elected a Foreign Member of the Linnean Society in 1833, and was also a Corresponding Member of the Botanical Section of the Academy of Sciences in the Institute of France.

In descriptive botany the name of Dr. Blume deservedly ranks high. In the early part of his career, his want of acquaintance with the literature of the science and with the great collections of Europe led him into the commission of numerous errors, as has been above said, in the identification of species, in the construction of genera, and in the reference of these genera to their proper position in the natural system. But these were necessary results of the circumstances under which he was placed, and of the rapidity with which he commenced the publication of his observations, before he had had the requisite opportunities for comparison; and they were gradually corrected as those opportunities were afforded. A tendency to the multiplication of species on insufficient grounds, which rather increased than diminished in his later years, may also be fairly objected to him; but it is his great merit to have done more than any other botanist since the days of his prototype for the elucidation of the flora of the great Malayan Archipelago, which constitutes the bulk of the Dutch possessions in Eastern Asia. Never was the prophetic application of a great name to one almost unknown in science more fully justified by the event, than when that of Rumphius was bestowed upon Professor Blume.

Isidore Geoffroy St.-Hilaire, son of Étienne Geoffroy, was born at Paris, on the 16th December, 1805, and died in the same city, on the 10th November, 1861.

Born, as it were, in the Museum, and bred in the menagerie founded by his illustrious father, and in the galleries filled by the labours of Cuvier and Lamarck, it is not to be wondered at that the son should

from the first have acquired a taste for zoological studies, for the pursuit of which he was placed in such advantageous circumstances and guided by such an able instructor.

Nor was he backward in taking advantage of his position. His first contribution to science was made in his nineteenth year, when he published the description of an American Bat (*Nyctinomus brasiliensis*); and at twenty-one he furnished the 'Dictionnaire Classique d'Histoire Naturelle' with an article, afterwards published in a separate form under the title of 'Considérations générales sur la Classe des Mammifères'—a work in which he thus early manifested the strong tendency of his mind to the generalization of facts, which he had doubtless acquired from his father's precepts and example.

From this time his contributions to science were numerous and varied; but it is unnecessary, perhaps, to notice any in particular, until we come to his first more important work, entitled 'Histoire générale et particulière des Anomalies de l'Organisation chez l'Homme et les Animaux; ou, Traité de Tératologie,' in three volumes, the first of which was published in 1832, and the last in 1836. The publication of this work, which may be regarded as an amplification and extended demonstration of the views respecting monstrosities entertained and already expressed by his father, led to the author's election, at the early age of twenty-seven, into the Academy, where he succeeded to the vacant seat of Latreille, in the section of Zoology, on the 15th April, 1833.

Previously to this, however, that is to say, in 1829, Isidore Geoffroy, then only twenty-four, had already commenced his career as a teacher, acting at first as an aid to his father, and selecting Ornithology as the subject of his lectures. In the following year he also delivered an interesting course of lectures at the "Athénée," having for their subject the fundamental relations of the species of animals *inter se* and towards the external world. In 1837 he was appointed his father's deputy at the Faculty of Sciences of Paris, a provisional chair which he shortly afterwards quitted to proceed to Bordeaux, where, under the title of "Dean," he undertook the organization of the Faculty of Sciences established in that city in 1838. Having fulfilled this mission, he returned to Paris, and was named Inspector of the Academy; and he also discharged the functions of Inspector-General of the University in 1840, although the title itself does not appear to have been actually bestowed upon him before 1844. These offices he continued to occupy until he succeeded M. de Blainville in the Zoological chair at the Faculty of Sciences in 1850. In addition, however, to the responsible duties of his inspectorial office, he had

also to supply the place in the Muséum, which had been so admirably filled by his father, who, like his fellow-labourers, Savigny and Lamarck, was about this time afflicted with the loss of sight. In 1841 this temporary position was rendered permanent, the disabled veteran in science yielding place to the young soldier he had so carefully reared; and Isidore Geoffroy, named Professor of Mammalogy at the Muséum, received during his father's life an inheritance worthily merited by the way in which he had long vicariously discharged the duties of the office. In fact, since 1824, he had performed the duties of "Aide Naturaliste" in the Jardin des Plantes, and in this capacity had under his superintendence and direction not only the collection of stuffed mammals and birds in the Muséum, but also the menagerie of living animals first brought together by Étienne Geoffroy in 1793. The zeal and industry displayed by him in the latter capacity may be judged of from the fact that in 1824 the collection included not more than 283 birds and mammals, whilst between 1850 and 1861 their number amounted on the average to about 900.

It was here also that he began to devote considerable attention to a branch of what may be termed applied zoology, in which, during the whole of his career, he continued to take the warmest interest, viz. the acclimatization of animals which may be useful to man either as food or as ministers otherwise to his wants or pleasures.

In pursuance of this object, he, in concert with several other men of science and of business, was mainly instrumental in the formation of the Imperial Zoological Society of Acclimatization, and in the establishment of the gardens belonging to that Society in the Bois de Boulogne, acting also as President of the Society from 1855 to his death.

In 1845 he received the decoration of the Legion of Honour; and he was elected a Foreign Member of our body in 1861.

Among his numerous contributions to zoological science, most of which have appeared in various periodicals, may be enumerated, besides those already mentioned, his 'Essais de Zoologie générale, ou Mémoires et Notices;' 'l'Anthropologie et l'Histoire de la Science,' 1840; 'Histoire Naturelle des Insectes et des Mollusques,' 1841; 'Vie, Travaux, et Doctrine Scientifique d'Étienne Geoffroy St.-Hilaire,' 1847; 'Catalogue Méthodique du Muséum d'Histoire Naturelle,' 1850-51; 'Essai sur la Domestication et la Naturalisation des Animaux utiles,' 1854; and, lastly, his 'Histoire Naturelle générale des Règnes organiques, principalement étudiée chez l'Homme,' 1854-55, an undertaking perhaps of too great a scope for any

individual to perform satisfactorily, and of which, at any rate, he lived to complete but a small part in three volumes. He had also been associated with M. Brongniart and other naturalists in an 'Account of the Natural History of the Voyage of the 'Vénus,' under the command of Dupetit Thouars.

Friedrich Tiedemann, one of the oldest and most illustrious of European anatomists and physiologists, was born at Cassel, on the 23rd of August, 1781.

His father was a literary man of considerable eminence, who at that time occupied the post of tutor in the Carolinian College, and, when his son was five years old, was appointed to the chair of Philosophy in the University of Marburg. Under his father's teaching, Tiedemann's education rapidly advanced, and he acquired more particularly an excellent knowledge of the classical languages, which he retained, and from which he derived vivid enjoyment, throughout his life.

He very soon, however, exhibited a strong taste for natural-history studies, in which he was much encouraged by Dr. Mönch, the Professor of Botany and Chemistry. At a very early period of his life he began to dissect small animals; and he was often in the habit of relating the joy he experienced, when eight years old, on discovering the relations of the œsophagus and trachea to the stomach and lungs respectively. This taste continuing to animate him as years went on, he had, at 15, made a considerable collection of the skulls and skeletons of animals; and at the end of his preliminary studies he devoted himself finally to zoology and medicine. Of these sciences, however, there were at that time no efficient teachers in Marburg, and Tiedemann was driven to depend upon books and his own researches for all the knowledge he could there acquire. But in 1802 he proceeded to Bamberg, in order to study Medicine more methodically under Professor Marcus, and afterwards to Würzburg, where he attended the practice of Thomann and Casper v. Siebold in the Julius Hospital.

Returning to Marburg in the spring of 1803, he had the misfortune to lose his father; and it would appear that the disappointment he experienced on finding that his professional cares were all in vain in his father's case caused him to take a distaste to the practice of medicine, and consequently to devote himself exclusively to the pursuit of zoology and physiology.

In the same year, at the instigation of Professor Brühl, he began to give private instruction in anatomy, physiology, and zoology to

the students of the University; and in the summer of 1804 he delivered his first course of lectures on physiology, comparative osteology, and the cranioscopy of Dr. Gall.

Finding, however, that his own knowledge was still very defective, he again repaired, in the autumn, to Würzburg, where, under Hesselbach, he occupied himself principally in the dissection of the nervous system, attending at the same time Schelling's Lectures on Natur-Philosophie, in which for a short time he hoped to find some new basis for Natural History, and more especially for Medicine. But inquiries of this transcendental nature seem always to have been foreign to his eminently practical and realistic mind, and thirty years afterwards he describes the only effect upon him of Schelling's lucubrations in these words:—"By his brilliant but fantastic views of the physical world, that great philosopher had himself removed from me all temptation to abandon the road of empirical research and observation."

Inspired by an ardent desire to enter on this road, he determined to proceed to Paris to consult the great collections there, and to benefit by the teaching of the great men under whom they were placed.

In Paris, Tiedemann laboured assiduously in the Jardin des Plantes and the Muséum, and attended the lectures of Cuvier, Étienne Geoffroy St.-Hilaire, Lamarck, Duméril, and Haüy.

But he was recalled from Paris sooner than he had intended. In 1805, on the recommendation of Sæmmering, he was appointed Professor of Zoology and Anatomy in the University of Landshut, at the early age of 25. Here he found abundant occupation; for, although he was installed in a new and beautiful anatomical theatre, it was totally unprovided with preparations of any kind. He found nothing in this way but a chest of bones and an Egyptian mummy; nor had he, moreover, any help in the supplying of these deficiencies, having first even to instruct his prosector in the art of dissection. Thanks to Napoleon, however, there were at that time plenty of subjects to be had at Landshut, which was occupied alternately by French, Bavarian, or Austrian troops, from whom the Anatomical Professor, at any rate, was furnished with abundant supplies of bodies, amounting probably on occasion to a superfluity, as after the battle of Austerlitz, in which 15,000 Russian prisoners were taken, very many of whom died on their transit through the town. Earnestly occupied in his work, and surrounded with a circle of scientific friends, his life passed usefully along, and in 1807 he married at Ratisbon

a lady distinguished as well by her intellectual as her personal gifts, by whom he had four sons and three daughters, only two of the former and one of the latter, however, surviving him.

In 1816 Professor Tiedemann quitted Landshut, where he had previously lost several of his more eminent colleagues, either by death or removal, for the wider sphere of the University of Heidelberg, where he again found himself the centre of a phalanx of young and active coadjutors. Here he remained, the chief ornament of the University, for thirty years, during which he formed, principally with his own hands, a magnificent collection of anatomical and physiological preparations, and attracted to his lectures crowds of students from all parts of Europe, who, drawn to him at first by his great reputation as a teacher, remained ever afterwards attached to him with an affectionate personal regard.

He continued thus occupied incessantly and zealously in the duties of his chair for nearly fifty years, when, partly broken down by the loss of a son, who fell in the political disturbances which arose in the Grand Duchy of Baden in 1848, and also by his increasing blindness, he retired in 1849 to Frankfort, though he nevertheless continued to occupy himself with physiological pursuits, and it was here that he prepared his last work, 'On the History of Tobacco, and its Effects,' in the course of which he made numerous and interesting experiments on the influence of Nicotine.

On the 10th of March, 1854 (the year in which this work was published), his numerous friends, admirers, and pupils celebrated, *more Teutonico*, the fiftieth anniversary of his Doctorate; and on this occasion a very fine commemorative medal was struck in his honour.

In the spring of 1855 the cataracts in his eyes had made such progress that his sight was almost destroyed, and he was unable to read or write, or even to go about alone. He consequently repaired to Heidelberg, where, under the skilful hands of Chelius, a highly successful operation restored vision to one who knew so well how to employ it, and whose chief delight was in the contemplation of nature.

In 1856 Tiedemann followed his son-in-law, Professor Bischoff, to Munich, in which city his and his wife's golden wedding-day was celebrated by his friends and relations on the 30th of March, 1857, and here he died on the 22nd of January, 1862.

I can refer but briefly to Professor Tiedemann's published works, and notice only the more important among them.

In 1808 appeared the first volume of his 'Zoology,' containing the natural history of Man and the Mammalia, in which he endeavoured

to combine the natural history of the animals with their anatomy, and to found upon the latter a new system of classification. The second volume of this work was not published till 1810–14, and is occupied with the anatomy and physiology of Birds. In 1813 appeared the ‘Anatomy of Acephalous Monsters;’ and in 1816 his great work on the ‘Anatomy and Development of the Foetal Human Brain, together with comparative exposition of the structure of the Brain in Animals’—a classical work, distinguished, like all from his pen, by the care, accuracy, and comprehensiveness of the observations contained in it. Notwithstanding the additions which, since that time our knowledge of the earliest development of the brain has received from embryology, Tiedemann’s researches have lost none of their value, and all subsequent inquirers have recognized the accuracy and admired the abundance of his facts. In 1817 he published a Monograph on the ‘Anatomy and Natural History of the Crocodile,’ which was commenced as an introduction to a general anatomy and natural history of the Reptilia, in conjunction with Oppel of Munich and Dr. Liboschitz; but this design, owing to the death of his coadjutors, was afterwards abandoned.

In the list of ASSOCIATES we have to deplore the loss of

James Forbes, who was elected on the 17th January, 1832, and died at the age of 68, on the 6th of July, 1861. He was born at Bridgend, in Perthshire, in May 1773, and commenced life as gardener at Dupplin Castle, in the same county. He was afterwards in the Marquis of Ailsea’s service, in the same capacity, at Culzean Castle, in Ayrshire, whence he went to Ireland, where he lived some years with Lord Hartland as steward and gardener. From thence he went to the Botanic Garden, Dublin, under Dr. Mackay; and from this situation he was appointed head gardener to the Duke of Bedford, who required a good botanist and one capable of forming the extensive gardens at Woburn Abbey, at which place he lived thirty-seven years.

He was an excellent practical gardener, and no mean botanist; and it is mainly, I believe, to him that we owe the ‘Salicetum’ and ‘Pine-tum Woburnense,’ works, however, in which he was assisted in some degree by Mr. Don, formerly Librarian to this Society. The estimation in which Mr. Forbes’s labours on this occasion were held by botanists may be judged of by the following extracts from Hooker’s ‘British Flora,’ in which, after speaking of the aid he received on the subject of Willows from Mr. Borrer, the author proceeds to say, “But the richest collection of living willows is unquestionably that

at Woburn Abbey, which has given rise to a splendid work, the 'Salicetum Woburnense,' in which we have a standard set of figures of all our native, amongst many exotic, species, which give to the British naturalist an advantage over all that Continental authors have published on the subject; and to them I refer in every instance, and with great satisfaction. The arrangement of the species in the 'Salicetum' is due to the botanical skill and knowledge of Mr. Forbes, head gardener at Woburn; and that department does him great credit."

James Townsend Mackay, LL.D., M.R.I.A., was elected an Associate so long ago as December 2, 1806. He died February 25th 1862, aged 86.

He was born at Kircaldy, Fifeshire, where he received the ordinary education afforded at parochial schools. He was bred to the occupation of a gardener, and held a situation in Scotland in that capacity before he went to Ireland in 1803. At that time the authorities of Trinity College, Dublin, had determined upon the formation of a botanical garden to aid the lectures of the Professor of Botany, a chair then held by Dr. Scott. To this gentleman Dr. Mackay was recommended as a suitable person to lay out the gardens, which he did soon afterwards, on his being appointed curator, a situation which he held from 1806 to 1862.

In the years 1804 and 1805, Dr. Mackay made tours through the western parts, more especially, of Ireland, for the purpose of observing the indigenous plants, which at that period were but imperfectly known. The results of these journeyings were published in a catalogue of the rarer plants of Ireland, in 1806, in the fifth volume of the 'Transactions of the Royal Dublin Society.' And on a subsequent occasion, when better acquainted with the indigenous flora, he gave for publication, to the Royal Irish Academy (of which learned body he was then a member), a catalogue of all the phænogamous plants and ferns known to him as native. These contributions, however, were but preparatory to his principal work, namely the 'Flora Hibernica,' published in 1836. In this work he edited only the phænogamous plants, Dr. Taylor and Dr. Harvey undertaking the Cryptogamia.

These, with one or two short papers communicated to the British Association, are, I believe, his only contributions to botanical science.

In 1850 the Board and Fellows of Trinity College, Dublin, conferred on him the title of LL.D.

The Secretary also announced that twenty-five Fellows, three Foreign Members, and one Associate had been elected since the last Anniversary.

At the Election which subsequently took place, George Bentham, Esq., was re-elected President; William Wilson Saunders, Esq., Treasurer; and George Busk, Esq. and Frederick Currey, Esq., Secretaries. The following five Fellows were elected into the Council, in the room of others going out: viz., Beriah Botfield, Esq., M. P.; Henry Christy, Esq.; J. E. Gray, Ph.D.; John Lubbock, Esq.; and R. C. A. Prior, M.D.

Mr. W. F. Saunders, on the part of the Auditors of the Treasurer's Accounts, read the Balance Sheet, by which it appeared that the total Receipts during the past year, including a Balance of £445 2s. 5*d.* carried from the preceding year, amounted to £1817 15s. 11*d.*, and that the total Expenditure during the same period (including the purchase of £200 Consols) amounted to £1144 2s. 9*d.*, leaving a Balance in the hands of the Bankers of £673 13s. 2*d.*

June 5th, 1862.

George Bentham, Esq., President, in the Chair.

Frederic Francis Hallett, Esq., and William Henry Kirton, Esq., were elected Fellows.

The President nominated Thomas Bell, Esq., J. J. Bennett, Esq., J. D. Hooker, M.D., and W. W. Saunders, Esq., Vice-Presidents for the ensuing year.

The following Papers were read, viz.:—

1. "Observations on the Gonidia and Confervoid Filaments of Mosses, and on the relation of their Gonidia to those of Lichens and of certain Freshwater *Algæ*;" by J. B. Hicks, M.D., F.R.S. & L.S. (See 'Transactions,' vol. xxiii. Part 3.)

2. Letter from Mr. Gustav Mann to Sir W. J. Hooker, dated February 27th, 1862, and giving an account of his ascent of the Cameroon Mountains. Communicated by Sir William Hooker, K.H., F.R.S. & L.S.

3. "On the Vegetation of the Cameroons;" by J. D. Hooker, M.D., F.R.S. & L.S.

4. "Enumeration of the Species of *Acanthaceæ* from the continent of Africa and the adjacent Islands;" by Thomas Anderson, M.D., F.L.S. (See 'Botanical Proceedings,' vol. vii.)

June 19th, 1862.

George Bentham, Esq., President, in the Chair.

The Rev. William Willox Peete was elected a Fellow.

Mr. Christy, F.L.S., exhibited specimens of the *Axolotl*, from Mexico, and of the *Proteus anguinus*, from the caves at Adelsberg.

Dr. Hooker, V.P.L.S., exhibited young individuals of *Welwitschia mirabilis*, showing the early stage of the leaves, while still entire.

The following Papers were read, viz. :—

1. "Observations on the Choice of Food in the Cod and Ling;" by William Laughrin, A.L.S. (See 'Zoological Proceedings,' vol. vi.)

2. "On the Specific Identity of the described Forms of *Tanalia*;" by Henry F. Blanford, Esq. Communicated by J. D. Hooker, Esq., M.D., F.R. & L.S. (See 'Transactions,' vol. xxiii. Part 3.)

3. "Notes on the *Thysanura*," Part 2; by John Lubbock, Esq., F.R.S., F.L.S. (See 'Transactions,' vol. xxiii. Part 3.)

Receipts and Payments of the Linnean Society from May 1, 1861, to April 30, 1862.

	£	s.	d.
Balance in the hands of the Bankers at last audit	445	2	5
Admission Fees	156	0	0
Compositions	417	0	0
Annual Contributions of £2 2s.	48	6	0
Do. of £3	470	12	0
Transactions and Journals sold	266	6	8
Dividends on Consols	14	8	10
<div style="float: right; text-align: right;"> <u>£1817 15 11</u> </div>			
Insurance	15	2	0
Repairs and Furniture	20	1	7
Coals, Gas, Tea, Postage, &c.	85	14	3
Salaries	195	0	0
Printing, Engraving, and Colouring.	539	5	6
Books purchased	62	8	1
Bookbinding and Stationery	26	3	1
Commission on Transactions, &c. sold, and Contributions collected	16	13	3
Purchase of £200 Consols	183	15	0
Balance in the hands of the Bankers	673	13	2
<div style="float: right; text-align: right;"> <u>£1817 15 11</u> </div>			

W. WILSON SAUNDERS, *Treasurer.*

The foregoing Accounts have been examined, and the Balance in hand found to be correctly stated at £673 13s. 2d.

GEORGE BENTHAM, *President.*
 FREDERICK CURREY,
 LOVELL REEVE,
 DANIEL HANBURY,

W. F. SAUNDERS,
 GEORGE BUSK,
 DANIEL OLIVER.

May 20, 1862.

ADDITIONS

TO THE

LIBRARY OF THE LINNEAN SOCIETY.

RECEIVED FROM JULY 1, 1860, TO DECEMBER 31, 1861.

[Continued from Vol. V. page lv.]

TITLES.	DONORS.
ACADEMIES and SOCIETIES.	
Amsterdam :—	
Kon. Akademie van Wetenschappen.	
Verslagen en Mededeelingen. Afdeeling Natuurkunde, deel 10. 8vo. Amsterdam, 1860.	
—— ——— Afd. Letterkunde, deel 5. 8vo. <i>Ib.</i> 1860.	
Jaarboek voor 1859. 8vo. <i>Ib.</i> 1860.	
Catalogus van de Boekerij der Akademie, deel 1, stuk 2. 8vo. <i>Ib.</i> 1860.	
Verslag over den Paalworm. 8vo. <i>Ib.</i> 1860.	THE ACADEMY.
Kon. Zoologisch Genootschap 'Natura Artis Magistra.'	
Bijdragen tot de Dierkunde, deel 1 (Afl. 1–6). 4to. Amsterdam, 1848–54.	THE SOCIETY.
Arkansas :—First and Second Reports of a Geological Reconnoissance of the Northern, Middle, and Southern Counties of the State, made during the Years 1857–60, by D. D. Owen, &c. 8vo. Little Rock (Arkansas) and Philadelphia, 1858–60.	THE STATE OF ARKANSAS.
Basel :—Naturforschende Gesellschaft. Verhandlungen, Theil 2, Heft 4. 8vo. Basel, 1860.	THE SOCIETY.

- | TITLES. | DONORS. |
|---|--------------------------------|
| ACADEMIES and SOCIETIES (<i>continued</i>). | |
| Batavia :—Natuurkundige Vereeniging in Nederlandsch Indie
(=Societas Scientiarum Indo-Neerlandicæ). | |
| Natuurkundig Tijdschrift : onder redactie van P. Bleeker.
4 ^{de} Serie, deel 6 (Afl. 1-6). 8vo. Batavia, 1859-60. | THE ASSOCIATION. |
| Berlin :— | |
| Entomologischer Verein. Berliner Entomologische Zeitschrift.
Jahrgang 2, 3 Heft 1-3, & 4. 8vo. Berlin, 1858-60. | W. W. SAUNDERS, Esq., V.P.L.S. |
| Königl. Akademie der Wissenschaften. | |
| Abhandlungen, aus den Jahren 1859 & 1860. 4to. Berlin,
1860-61. | |
| Monatsbericht, aus den J. 1860 & 1861. 8vo. <i>Ib.</i> 1861-
62. | |
| — Register, vom J. 1836-58. 8vo. <i>Ib.</i> 1860. | THE ACADEMY. |
| Verein zur Beförderung des Gartenbaues in den K. Preus-
sischen Staaten. | |
| Verhandlungen, Band 20, Heft 2. 4to. Berlin, 1851. | |
| — Neue Reihe, Jahrg. 3 ; 6 Heft 3, und 7 Heft 1 & 2. 8vo.
<i>Ib.</i> 1855-60. | |
| Wochenschrift : redigirt von den General-Sekretair des
Vereines, Prof. Dr. Karl Koch. Jahrgang 1, nos. 1-33 ;
Jahrg. 3, nos. 34-52 ; und Jahrg. 4, nos. 1-8, und nos. 22-
48. 4to. <i>Ib.</i> 1860-61. | THE SOCIETY. |
| Berwick : — Berwickshire Naturalists' Club. Proceedings,
vol. 4, no. 4. 8vo. 1860. | THE CLUB. |
| Bombay :—Government Observatory. Magnetical and Meteo-
rological Observations made at, in the year 1858. 4to.
Bombay, 1859. | HER MAJESTY'S GOVERNMENT. |
| Bonn :—Naturhistorischer Verein der Preussischen Rhein-
lande, &c. Verhandlungen, Jahrgang 17. 8vo. Bonn,
1860. | THE ASSOCIATION. |
| Boston :— | |
| American Academy of Arts and Sciences. | |
| Memoirs, new series, vol. 6, pt. 2, and vol. 7. 4to. Cam-
bridge and Boston, 1858-60. | |
| Proceedings, vol. 4, sheets 12-57, and vol. 5, sheets 1-30.
8vo. <i>Ib.</i> 1860. | THE ACADEMY. |

TITLES.	DONORS.
ACADEMIES and SOCIETIES (<i>continued</i>).	
Boston (<i>continued</i>) :—	
Society of Natural History.	
Journal, vol. 7, no. 1. 8vo. Boston, 1859.	
Proceedings, vol. 6, sheets 23–28 ; vol. 7, sheets 1–25, 27, 28, and title ; and vol. 8, sheets 1–4. 8vo. <i>Ib.</i> 1858–61.	
	THE SOCIETY.
Brussels :—Académie R. des Sciences de Belgique.	
Mémoires, tome 32. 4to. Bruxelles, 1861.	
Mémoires couronnés, &c. Collection in 8vo, tome 10. <i>Ib.</i> 1860.	
Bulletins. 2 ^e série, tomes 9 & 10. 8vo. <i>Ib.</i> 1860.	
Annuaire. 27 ^e année. 12mo. <i>Ib.</i> 1861.	THE ACADEMY.
Observations des Phénomènes périodiques (an 1859). 4to.	
Phénomènes périodiques ; Magnétisme, Astronomie. 8vo.	
Sur les Phénomènes Périodiques des Plantes et des Animaux. 8vo.	
Sur le Congrès International de Statistique, tenu à Londres en 1860. 4to.	THE AUTHOR, M. AD. QUÉTELET.
Calcutta :—Asiatic Society. Journal, vols. 29 & 30. 8vo. Calcutta, 1860–61.	THE SOCIETY.
Canada :—Geological Survey of. Report of Progress for the year 1858. 8vo. Montreal, 1859.	SIR W. E. LOGAN ?
— :—v. <i>Kingston and Montreal.</i>	
Cherbourg :—Société Imp. des Sciences Naturelles. Mémoires, tomes 6 & 7. 8vo. Paris, 1859–60.	THE SOCIETY.
Christiania :—Kong. Norske Frederiks Universitet. Stiftelse fremstillet i Anledning af dets Halvhundredaarsfest ; af M. J. Monrad. 8vo. Christiania, 1861.	THE UNIVERSITY.
Copenhagen :—K. Danske Videnskabernes Selskab. Oversigt i aar. 1859. 8vo. Kjöbenhavn.	THE SOCIETY.
Dublin :—	
Geological Society. Journal, vol. 8, part 3. 8vo. Dublin, 1860.	THE SOCIETY.
Royal Dublin Society. Journal, nos. 1–8, & 16–19. 8vo. Dublin, 1856–60.	THE SOCIETY.
Royal Irish Academy. Transactions, vol. 24, part 1. Science. 4to. Dublin, 1860.	THE ACADEMY.
University Zoological and Botanical Association. Proceedings, vol. 1, part 3, and vol. 2, part 1. 8vo. Dublin, 1859–60.	THE ASSOCIATION.

TITLES.	DONORS.
ACADEMIES and SOCIETIES (<i>continued</i>).	
Edinburgh :—	
Botanical Society. Transactions, vol. 6, pt. 3, and vol. 7, pt. 1. 8vo. Edinburgh, 1860-61.	THE SOCIETY.
Royal Society.	
Transactions, vol. 22, part 2. 4to. (Edinburgh, 1860.)	
—, Supplement to vol. 22, part 2. (Append. to Makers- toun Magnet. &c. Observations). 4to. <i>Ib.</i> 1860.	
Proceedings, vol. 4, nos. 50-52. 8vo. (<i>Ib.</i> 1860.)	THE SOCIETY.
Royal Physical Society. Proceedings, vol. 1. 8vo. Edin- burgh, 1858.	THE SOCIETY.
Frankfort-a.-M. :—Senckenbergische Naturforschende Gesell- schaft. Abhandlungen, Band 3, Lief. 2. 4to. Frankfurt- a.-M., 1861.	THE SOCIETY.
Geneva :—Société de Physique et d'Histoire Naturelle. Mé- moires, tome 15, partie 2, and tome 16, partie 1. 4to. Genève, 1860-61.	THE SOCIETY.
Giessen :—Oberhessische Gesellschaft für Natur- und Heil- kunde. Bericht 8. 8vo. Giessen, 1860.	THE SOCIETY.
Göttingen :—K. Gesellschaft der Wissenschaften.	
Abhandlungen, Band 9. 4to. Göttingen, 1861.	
Nachrichten, vom J. 1860. 12mo. <i>Ib.</i>	THE SOCIETY.
Halifax, Nova Scotia :—Literary and Scientific Society. Trans- actions, from Jan. 4 to Dec. 3, 1859. 8vo. Halifax, N. S., 1859.	THE SOCIETY.
Jena :—Academia Cæs. Naturæ Curiosorum. Nova Acta, tomus 28. 4to. Jenæ, 1861.	THE ACADEMY.
Kingston, Canada West :—Botanical Society. Annals, vol. 1, parts 1 & 2. 4to. Kingston, C. W., 1861.	THE SOCIETY.
Königsberg :—K. Physikalisch-ökonomische Gesellschaft. Schriften, Jahrgang 1, Abth. 1 & 2. 4to. Königsberg, 1860-61.	THE SOCIETY.
Lausanne :—Société Vaudoise des Sciences Naturelles. Bulle- tin, tome 6, no. 47. 8vo. Lausanne, 1860.	THE SOCIETY.
Leeds :—Philosophical and Literary Society. Annual Reports (40 & 41) for 1859-60 and 1860-61. 8vo. Leeds, 1860- 61.	THE SOCIETY.

TITLES.

DONORS.

ACADEMIES and SOCIETIES (*continued*).

Leyden :—Nederlandsche Entomologische Vereeniging. Tijdschrift voor Entomologie; onder redactie van Prof. J. van der Hœven, &c. Deel 3, stuk 4-6, and deel 4, stuk 1-4. 8vo. Leyden, 1860. THE ASSOCIATION.

Liège :—Société R. des Sciences. Mémoires, tomes 15 & 16. 8vo. Liège, 1860-61. THE SOCIETY.

Liverpool :—Literary and Philosophical Society. Proceedings, nos. 14 & 15. 8vo. Liverpool, 1860-61. THE SOCIETY.

London :—

Art-Union.

Reports of the Council for the years 1860 & 1861, and Lists of Members. 8vo. London, 1860-61.

Almanacs for 1861 and 1862. *Ib.* 1860-61.

THE ART-UNION.

British Association for the Advancement of Science. Report of the 30th Meeting. 8vo. London, 1861.

THE ASSOCIATION.

Entomological Society. Transactions, New Series, vol. 5, pts. 3-5. 8vo. London, 1859-60. THE SOCIETY.

Geological Society.

Quarterly Journal, vol. 16, pts. 3 & 4, and vol. 17, pts. 1-4. 8vo. London, 1860-61.

List of the Members, September 1st, 1860. 8vo.

THE SOCIETY.

Geological Survey of Great Britain. Memoirs. Mining Records, &c. for 1858-60. 8vo. London.

THE SURVEY.

Horticultural Society.

Proceedings, vol. 1, nos. 14-31. 8vo. London, 1860-61.

List of Members, August 1860. 8vo. *Ib.* THE SOCIETY.

Microscopical Society :—v. *Journals*.

Palæontographical Society. Publications of, 2 vols. 4to, containing—

Bell (T.) Monograph of the Fossil Malacostracous Crustacea of Great Britain, part 1. 4to. London, 1857.

Davidson (T.) Monograph of British Permian Brachiopoda, part 4. 4to. *Ib.* 1857.

— Monograph of British Carboniferous Brachiopoda, part 5. 4to. *Ib.* 1857.

TITLES.	DONORS.
ACADEMIES and SOCIETIES (<i>continued</i>).	
London (<i>continued</i>) :—	
Palæontographical Society (<i>continued</i>).	
Edwards (F. E.) Monograph of the Eocene Mollusca, part 3, no. 2. 4to. London, 1856.	
Jones (T. R.) Monograph of the Tertiary Entomostraca of England. 4to. <i>Ib.</i> 1856.	
Owen (R.) Monograph of the Fossil Reptilia of the Wealden Formation, parts 3 & 4. 4to. <i>Ib.</i> 1856–57.	
Sharpe (D.) Fossil Remains of Mollusca found in the Chalk of England, part 3. 4to. <i>Ib.</i> 1856.	
Wood (S. V.) Monograph of the Crag Mollusca, vol. 2. <i>Bivalves</i> . 4to. <i>Ib.</i> 1850–56.	
Wright (T.) Monograph of the British Fossil Echinodermata of the Oolitic Formations, parts 1 & 2. 4to. <i>Ib.</i> 1855–56.	
EXECUTORS OF THE LATE J. D. SALMON, Esq., F.L.S.	
Pharmaceutical Society. Journal, 2nd series, vol. 2, and vol. 3, nos. 1–6. 8vo. London, 1860–61.	THE SOCIETY.
Ray Society.	
Reports on the Progress of Zoology and Botany for 1841–42, and 1843–44. 8vo. London, 1845–47.	
Botanical and Physiological Memoirs: edited by Arthur Henfrey, F.R.S., F.L.S. 8vo. London, 1853.	R. KIPPIST, Libr. L.S.
Royal Society.	
Philosophical Transactions, vol. 150, parts 1 & 2. 4to. London, 1860–61.	
Proceedings, nos. 39–46. 8vo. <i>Ib.</i> 1860–61.	THE SOCIETY.
Royal Agricultural Society. Journal, vol. 21, pts. 1 & 2, and vol. 22, pt. 1. 8vo. London, 1860–61.	THE SOCIETY.
Royal Asiatic Society. Journal, vol. 18, pts. 1 & 2, and vol. 19, pts. 1 & 2. 8vo. London, 1860–61.	THE SOCIETY.
Royal Astronomical Society. Memoirs, vols. 28 & 29. 4to. London, 1860–61.	THE SOCIETY.
Royal College of Physicians. List of Fellows, Members, &c. 8vo. London, 1860.	THE COLLEGE.
Royal Geographical Society.	
Journal, vols. 29 & 30. 8vo. London, 1859–60.	
Proceedings, vol. 4, nos. 3–5, and vol. 5, nos. 1–5. 8vo. <i>Ib.</i> 1860–61.	THE SOCIETY.

TITLES.

DONORS.

ACADEMIES and SOCIETIES (*continued*).London (*continued*):—

Royal Institution.

Notices of the Proceedings, parts 10 & 11. 8vo. London, 1860–61.

Additions to the Library, nos. 3 & 4. 8vo.

Lists of the Members; and Report of the Visitors for 1859 & 1860. 8vo. London, 1860–61. THE INSTITUTION.

Royal Medical and Chirurgical Society.

Transactions, vols. 43 & 44. 8vo. London, 1860–61.

Proceedings, vol. 3. nos. 4–6. 8vo. *Ib.* 1860–61.

THE SOCIETY.

Society of Arts. Journal, nos. 396–477. 8vo. London, 1860–61. THE SOCIETY.

Wernerian Club.

Pliny's Natural History: a translation on the basis of that by Dr. P. Holland, vols. 1, 2, & 3, parts 1–5. 8vo. London, 1847–49.

Ray (J.) The Wisdom of God manifested in the Works of the Creation (parts 1–4). 8vo. *Ib.* 1845–47.

— Miscellaneous Discourses concerning the Dissolution and Changes of the World (parts 1–5). 8vo. *Ib.* 1850.

Werner (A. G.) Treatise on the external Characters of Minerals (parts 1–3). *Ib.* 1849–50.

EXECUTORS OF THE LATE J. D. SALMON, Esq., F.L.S.

Zoological Society.

Transactions, vol. 4, pt. 7, sect. 1. 4to. London, 1861.

Proceedings, with Illustrations, parts 1–3 for 1860, and part 1 for 1861. 8vo. *Ib.* 1861. THE SOCIETY.

Lyon:—

Académie Imp. des Sciences, &c. Mémoires, Nouvelle Série. Classe des Sciences, tome 8. 4to. Lyon, 1858, et Classe des Lettres, tomes 7 & 8. 4to. *Ib.* 1858–60.

THE ACADEMY.

Société Imp. d'Agriculture. Annales des Sciences Physiques et Naturelles, &c., 3^e Série, tomes 2 & 3. 4to, Lyon, 1858–59. THE SOCIETY.

Société Linnéenne. Annales, Nouvelle Série, tomes 5 & 6. 4to. Lyon, 1858–60. THE SOCIETY.

TITLES.	DONORS.
ACADEMIES and SOCIETIES (<i>continued</i>).	
Madras :—Literary Society. Madras Journal of Literature and Science. New Ser. vol. 5, no. 10, and vol. 6, no. 11. 8vo. Madras, 1859–61.	THE SOCIETY.
Manchester :—Field Naturalists' Society. Report of the Committee for the year 1860. 8vo. London, 1861.	THE SOCIETY.
Mauritius :—Royal Society of Arts and Sciences. Transactions, New Series, vol. 1, pt. 2. 8vo. Mauritius, 1860.	THE SOCIETY.
Montreal :—Natural History Society. Canadian Naturalist and Geologist, vol. 6, nos. 1–5. 8vo. Montreal, 1861.	THE SOCIETY.
Moscow :—Société Imp. des Naturalistes.	
Nouveaux Mémoires, tomes 11, 12, & 13, livr. 1 & 2. 4to. Moscou, 1859–61.	
Bulletin, tome 32, nos. 2, 3 & 4, and tome 33, nos. 1–4. 8vo. <i>Ib.</i> 1859–60.	THE SOCIETY.
Munich :—Königl. Bayerische Akademie der Wissenschaften.	
Abhandlungen der mathem.-physikal. Classe, Band 8, Abth. 3. 4to. München, 1860.	
Gelehrte Anzeigen, Bände 49 & 50. 4to. <i>Ib.</i> 1860.	
Sitzungsberichte, 1860, Heft 1–5, und 1861, I., Heft 1–4. 8vo. <i>Ib.</i> 1860–61.	THE ACADEMY.
Newcastle-upon-Tyne :—Tyneside Naturalists' Field Club.	
Transactions, vol. 4, pts. 3 & 4, and vol. 5, pt. 1. 8vo. Newcastle-upon-Tyne, 1860–61.	THE CLUB.
New York :—	
Cooper Union for the Advancement of Science and Art. Annual Report (2nd). 8vo. New York, 1861.	THE UNION.
Lyceum of Natural History. Annals, vol. 7, nos. 4–9. 8vo. New York, 1860.	THE LYCEUM.
Paris :—	
Académie des Sciences de l'Institut. Mémoires, tomes 28 & 30. 4to. Paris, 1860.	THE ACADEMY.
Société Botanique. Bulletin, tome 6, no. 10; tome 7, nos. 1–5 & 7; et tome 8, nos. 2–5. 8vo. Paris, 1859–61.	THE SOCIETY.

TITLES.

DONORS.

ACADEMIES and SOCIETIES (*continued*).

Petersburg:—

Académie Imp. des Sciences.

Mémoires. 6^e Série. Sciences Naturelles, tome 8 et dernier. 4to. St. Pétersbourg, 1859.——. 7^e Série, tome 2, nos. 1–7, et tome 3, nos. 1–11. 4to. *Ib.* 1859–61.Mémoires présentés à l'Académie par divers Savants, tomes 8 & 9. 4to. *Ib.* 1859.Bulletin, tome 1, nos. 3–9; tome 2, nos. 1–8; tome 3, nos. 1–8, et tome 4, nos. 1 & 2. 4to. (*Ib.*) 1859–61.

THE ACADEMY.

Philadelphia:—

Academy of Natural Sciences.

Journal. New Series, vol. 3, pt. 3, and vol. 4, pt. 4. Fol. Philadelphia, 1856–60.

Proceedings, vol. 8, nos. 3 & 4, sheets 6–42 for 1860, and sheets 1–10 for 1861. 8vo. *Ib.* 1861.Notice of the Origin, Progress, &c. of the Academy; by W. S. W. Ruschenberger, M.D. 8vo. *Ib.* 1860.

THE ACADEMY.

American Philosophical Society.

Transactions. New Series, vol. 11, parts 2 & 3. 4to. Philadelphia, 1859–60.

Proceedings, vol. 6, nos. 59 & 60, and vol. 7, nos. 61–63. 8vo. *Ib.* 1858–60.

THE SOCIETY.

Regensburg:—Königl. Botanische Gesellschaft.

Flora, oder Botanische Zeitung, Jahrg. 1–25. Small 8vo. Regensburg, 1818–42.

—— Allgemeines Sach- und Namen-Register, von J. K. Hasskarl. 8vo. *Ib.* 1851.Flora, oder Allgemeine Botanische Zeitung; Neue Reihe, redigirt von Dr. A. E. Fürnrohr. Jahrgang 1–15. 8vo. *Ib.* 1843–57. (PURCHASED.)

St. Louis, Missouri:—Academy of Sciences. Transactions, vol. 1, nos. 3 & 4. 8vo. St. Louis, 1859–60.

THE ACADEMY.

Stettin:—Entomologischer Verein.

Entomologische Zeitung, Jahrgang 15. 8vo. Stettin, 1854.

Linnæa Entomologica, Bände 9 & 14. 8vo. Berlin, 1854–60.

THE ASSOCIATION.

TITLES.	DONORS.
ACADEMIES and SOCIETIES (<i>continued</i>).	
Stockholm :—Kongl. Vetenskaps-Akademien.	
Handlingar. Ny Följd. Band 2, Häftet 2, och Band 3, Häftet 1. 4to. Stockholm, 1860–61.	
Öfversigt, Årg. 16 & 17. 8vo. <i>Ib.</i> 1860–61.	
Kongl. Svenska Fregatten 'Eugenies' Resa omkring Jorden, under Befäl af C. A. Virgin, 1851–53. Häft. 7–11. 4to. <i>Ib.</i> 1859–61.	THE ACADEMY.
Tasmania :—Royal Society.	
Papers and Proceedings, vol. 3, pt. 2. 8vo. Hobart, 1859.	
Report for the year 1858. 8vo. <i>Ib.</i> 1859.	THE SOCIETY.
Toronto :—v. <i>Canadian Journal</i> .	
Turin :—R. Accademia delle Scienze. Memorie, Serie 2, tomi 18 e 19. Scienze Fisiche e Matematiche. 4to. Torino, 1859–61.	THE ACADEMY.
Upsal :—Regia Societas Scientiarum.	
Nova Acta. Series 3, vol. 2, fasc. 2, et vol. 3. 4to. Upsaliæ, 1858–61.	
Årsskrift, Årgång. 1 & 2. 8vo. <i>Ib.</i> 1860–61.	THE SOCIETY.
Venice :—Imp. Reg. Istituto Veneto di Scienze, Lettere, ed Arti.	
Memorie, vol. 9, parte 2 & 3. 4to. Venezia, 1861.	
Atti. Serie 3, tomo 6, Dispensa 1–9. 8vo. <i>Ib.</i> 1860–61.	THE INSTITUTE.
Victoria :—	
Pharmaceutical Society. Quarterly Journal and Transactions, vol. 2, no. 8. 8vo. Melbourne, 1860.	
	DR. FERD. MÜLLER, F.R. & L.S.
Philosophical Institute. Transactions, vol. 4, part 2. 8vo. Melbourne, 1860.	THE INSTITUTE.
Vienna :—	
Kaiserl. Akademie der Wissenschaften.	
Denkschriften. Mathem.-Naturw. Classe. Bd. 15, 16, 18, & 19. 4to. Wien, 1858–61.	
Sitzungsberichte. Mathem.-Naturw. Classe. Bd. 30, nos. 16 & 17 ; Bände 31–35 ; 39–42 ; und 43, Abth. 1 & 2. 8vo. <i>Ib.</i> 1858–61.	
Feierliche Sitzungen, 30 Mai, 1859, und 31 Mai, 1861. 12mo. <i>Ib.</i>	
Anleitung zu den Magnetischen Beobachtungen ; von Karl Kreil. 2 ^{te} Auflage. 8vo. <i>Ib.</i> 1858.	

TITLES.

DONORS.

ACADEMIES and SOCIETIES (*continued*).Vienna (*continued*):—Kaiserl. Akademie der Wissenschaften (*continued*).Jahrbücher der K. K. Central-Anstalt für Meteorologie, &c.,
von Karl Kreil, Ph.D., &c. Bd. 7. 4to. Wien, 1860.

THE ACADEMY.

K. K. Geologische Reichs-Anstalt.

Jahrbücher. Jahrgang 11, Nos. 1 & 2. 8vo. Wien, 1860.

THE INSTITUTE.

K. K. Zoologisch-Botanische Gesellschaft.

Verhandlungen. Bände 7, 9, & 10. 8vo. Wien, 1857–60.

THE SOCIETY.

Washington:—

Smithsonian Institution.

Smithsonian Contributions to Knowledge, vols. 11 & 12.
4to. Washington, 1859–60.Annual Reports of the Board of Regents for the years 1858
and 1859. 8vo. *Ib.* 1859–60. THE INSTITUTION.United States Coast Survey. Report of the Superintendent
(Prof. A. D. Bache) for 1857. 4to. Washington, D.C.,
1858. THE HOUSE OF REPRESENTATIVES.

Würzburg:—Physikalisch-Medicinische Gesellschaft.

Würzburger Medicinische Zeitschrift; redigirt von H. Bam-
berger, &c. Band 1, Heft 2–6, und Bd. 2, Heft 1–4.
8vo. Würzburg, 1860–61.Würzburger Naturwissenschaftliche Zeitschrift; redigirt
von H. Müller, &c. Band 1, Heft 2–4, und Bd. 2, Heft 1.
8vo. *Ib.* 1860–61. THE SOCIETY.*Anonymous*:—London and Provincial Medical Directory. 8vo. London, 1861.
PURCHASED.Aasen (J.) Norske Plantenavne (Budstikken, no. 1). 8vo. 1860.
ROYAL UNIVERSITY OF CHRISTIANIA.Albers (J. C.) Die Heliceen nach natürlicher Verwandtschaft. 2^{te}
Ausgabe, von Ed. von Martens. 8vo. Leipzig, 1861.

HUGH CUMING, Esq., F.L.S.

Ambrosi (Fr.) Flora Tiroliaë Australis, vol. 2, fasc. 3 & 4. 8vo.
Padova, 1857. THE AUTHOR.Babington (C. C.) Manual of British Botany. 4th edition. 12mo.
London, 1856. EXECUTORS OF J. D. SALMON, Esq., F.L.S.

- | TITLES. | DONORS. |
|--|---|
| Baines (H.) Flora of Yorkshire. 8vo. London, 1840. | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Barry (Rev. Dr.) History of the Orkney Islands: 2nd edition, by the Rev. James Headrick. 4to. London, 1808. | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Batsch (A. J. G. C.) Elenchus Fungorum. 4to. Halæ Magdeburgicæ, 1783-89. | (PURCHASED.) |
| Baumgarten (J. C. G.) Enumeratio Stirpium Magno-Transsilvaniæ Principatui. Tomi 3. 8vo. Vindobonæ, 1816. | (PURCHASED.) |
| Beddome (R. H.) Extract from Report on the Vegetable Products of the Pulney Hills. 8vo. | H. F. C. CLEGHORN, Esq., M.D., F.L.S. |
| Bennett (G.) Gatherings of a Naturalist in Australasia. 8vo. London, 1860. | THE AUTHOR. |
| Bentham (G.) Flora Hongkongensis: a Description of the Flowering Plants and Ferns of the Island of Hong-Kong. 8vo. London, 1861. | THE AUTHOR. |
| Berkeley (Rev. M. J.) Introduction to Cryptogamic Botany. 8vo. London, 1857. | (PURCHASED.) |
| Berkenhout (J.) Clavis Anglica Linguae Botanicæ. 2nd edition; to which is added Calendarium Botanicum. 8vo. London, 1789. | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Bernardi (Chev.) Monographie du genre <i>Conus</i> . 4to. Paris. | H. CUMING, Esq., F.L.S. |
| Binney (W. G.) Terrestrial Air-breathing Mollusks of the United States, vol. 4 (supplemental). 8vo. Boston, 1859. | H. CUMING, Esq., F.L.S. |
| Black's General Atlas of the World. Fol. Edinburgh, 1860. | T. C. JANSON, Esq., F.L.S. |
| Blackwall (John) History of the Spiders of Great Britain and Ireland. Fol. London, 1861. | R. KIPPIST, Libr. L.S. |
| Bland (T.) Remarks on certain Species of North American Helicidæ. 8vo. New York, 1860. | H. CUMING, Esq., F.L.S. |
| Blume (C. L.) et Fischer (J. B.) Flora Javæ; necnon Insularum adjacentium. 2 voll. Fol. Bruxellis, 1828 ——. (PURCHASED.) | |
| Blytt (M. N.) Norge's Flora, deel 1. 8vo. Christiania, 1861. | THE AUTHOR. |
| Bonaparte (C. L.) Geographical and Comparative List of the Birds of Europe and North America. 8vo. London, 1838. | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |

- | TITLES. | DONORS. |
|--|---|
| Boott (F.) Illustrations of the genus <i>Carex</i> , part 2. Fol. London, 1860. | Fol. London,
THE AUTHOR. |
| Botfield (B.) Shropshire; its History and Antiquities. 4to. London, 1860. | 4to. Lon-
don, 1860.
THE AUTHOR. |
| Bourguignat (J. R.) Aménités Malacologiques, tome 2. 8vo. Paris, 1860. | 8vo.
Paris, 1860. |
| —— Methodus Conchyliologicus Denominationis. 8vo. <i>Ib.</i> 1860. | 8vo. <i>Ib.</i> 1860. |
| —— Malacologie terrestre de l'Ile du Château d'If, près de Marseille. 8vo. <i>Ib.</i> 1860. | 8vo. <i>Ib.</i> 1860. |
| —— Malacologie terrestre et fluviatile de la Bretagne. 8vo. <i>Ib.</i> 1860. | 8vo. <i>Ib.</i>
H. CUMING, Esq., F.L.S. |
| Brevoort (J. C.) Notes on some figures of Japanese Fish, taken from recent specimens by the Artists of the U.S. Japan Expedition, under Commodore M. C. Perry, U.S.N. 4to. (Washington, 1856.) | 4to. (Washington,
1856.)
THE AUTHOR. |
| Brody (G. S.) Weston-super-Mare Catalogue of British Shells. 8vo. Weston-s.-M., 1859. | 8vo. Weston-s.-M., 1859.
THE AUTHOR. |
| Brown (J. P.) Catalogue des Plantes ... de Thoune, et ... de l'Oberland Bernois. 12mo. Thoune, &c., 1843. | 12mo. Thoune, &c., 1843.
P. L. SCLATER, Esq., F.L.S. |
| Buckman (J.) Botanical Guide to the Environs of Cheltenham. 8vo. Cheltenham, 1844. | 8vo. Cheltenham, 1844.
EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Cailliaud (F.) Note sur un nouveau fait relatif à la perforation des pierres par les Pholades. 8vo. Nantes, 1852. | 8vo. Nantes, 1852. |
| —— Notice sur le genre <i>Clausilia</i> . 8vo. <i>Ib.</i> 1854. | 8vo. <i>Ib.</i> 1854. |
| —— Observations sur les Oursins perforants de Bretagne. 8vo. | 8vo. |
| —— ———. Supplément. 8vo. 1857. | 8vo. 1857. H. CUMING, Esq., F.L.S. |
| Camplin (J. M.) On <i>Diabetes</i> , and its successful Treatment. 2nd edition. 12mo. London, 1860. | 2nd
edition. 12mo. London, 1860.
THE AUTHOR. |
| Carus (J. V.) et Engelmann (W.) Bibliotheca Zoologica. Verzeichniss der Schriften über Zoologie, welche ... vom 1846-60 ... erschienen sind. 2 ^{ter} Band. 8vo. Leipzig, 1861. | 8vo. Leipzig, 1861.
(PURCHASED.) |
| Caspary (R.) De Abietinearum, Carr., floris feminei structura morphologica. 4to. Regiomonti, 1861. | 4to. Regiomonti, 1861.
THE AUTHOR. |
| Chenu (J. C.) Illustrations Conchyliologiques. Livr. 1-17. Fol. Paris. | Livr. 1-17. Fol.
Paris. |
| —— Manuel de Conchyliologie. Tome 1 (parties 1 & 2). 8vo. <i>Ib.</i> 1859-60. | 8vo.
<i>Ib.</i> 1859-60.
H. CUMING, Esq., F.L.S. |

- | TITLES. | DONORS. |
|---|---|
| Ciccione (A.) Études sur le corps gras du Ver à Soie ; traduite par le Dr. Montagne. 8vo. Paris, 1861. | THE AUTHOR? |
| Clarke (R.) Remarks on the Topography and Diseases of the Gold Coast. 8vo. 1860. | THE AUTHOR. |
| Cleghorn (H. F. C.) Memorandum upon the Panchontée, or Indian Gutta Tree, of the Western Coast. 4to. Madras, 1858. | |
| — Report, as Conservator of Forests, to the Secretary to Government ; dated Mangalore, May 1st, 1858. 4to. | |
| — General Index to Dr. Wight's 'Icones Plantarum Indiæ Orientalis.' 4to. Madras, 1856. | |
| — Reports on the Government Botanical and Horticultural Gardens, Ootacamund, for the years 1858 & 1859. 8vo. <i>Ib.</i> 1859-60. | |
| — Forests and Gardens of South India. 12mo. London, 1861. | THE AUTHOR. |
| Cobbold (T. S.) On the Scope, Tendency, and Educational Value of the Natural-History Sciences. 8vo. London, 1861. | THE AUTHOR. |
| Collingwood (C.) On Homomorphism, or Organic Representative Form. 8vo. Liverpool, 1860. | THE AUTHOR. |
| Daubeny (C.) On the Physical Forces concerned in the Phenomena of Vegetation. (From the Gard. Chron.) | |
| — On the Power ascribed to the Roots of Plants of rejecting Poisonous or Abnormal Substances presented to them. (From Quart. Journ. of Chem. Soc.) 8vo. | |
| — Remarks on the Final Causes of the Sexuality of Plants ; with particular reference to Mr. Darwin's work on the Origin of Species. 8vo. Oxford, 1860. | THE AUTHOR. |
| Degland (C. D.) Ornithologie Européenne. 2 tomes. 8vo. Paris, 1849. | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Denny (H.) Monographia Anoplurorum Britanniaë. 8vo. London, 1842. | (PURCHASED.) |
| Drouet (H.) Essai sur les Mollusques terrestres et fluviatiles de la Guiane Française. 8vo. Paris, 1859. | H. CUMING, Esq., F.L.S. |
| Drury (Major H.) The Useful Plants of India. 8vo. Madras, 1858. | THE AUTHOR. |
| Duby (J. E.) Mémoire sur la tribu des Hystérinées, de la famille des Hypoxylées. 4to. Genève, 1861. | THE AUTHOR. |
| Eaton (D. C.) Filices Wrightianæ (Cubenses) ; et Fendlerianæ (Venezuelanæ, &c.). 4to. Cantabrigiæ, Nov. Angl., 1860. | F. BOOTT, Esq., M.D., F.L.S. |

- | TITLES. | DONORS. |
|--|--|
| Elditt (H. L.) Die Metamorphose des <i>Caryborus</i> (<i>Bruchus</i>) <i>gonagra</i> , Fabr. 4to. Königsberg, 1860. | THE AUTHOR. |
| Frauenfeld (G.) Notizen gesammelt während meines Aufenthaltes auf Neuholland, Neuseeland, und Taiti. 8vo. Wien, 1860. | H. CUMING, Esq., F.L.S. |
| Freke (H.) On the Origin of Species by means of Organic Affinity. 8vo. London, 1861. | THE AUTHOR. |
| Fries (E.) Monographia Hymenomycetum Sueciæ. Vol. 1. 8vo. Upsaliæ, 1857. | |
| — Reliquiæ Afzelianæ; sistentes Icones Fungorum quos in Guinea collegit Adamus Afzelius. Fol. <i>Ib.</i> 1860. | THE AUTHOR. |
| Friesen (J. O. von) Öfversigt af Sveriges Ornithologiska Litteratur. 8vo. Stockholm, 1860. | THE AUTHOR. |
| Gibb (G. D.) Description, Composition, and Preparations of <i>Sanguinaria canadensis</i> (Pharmaceut. Journ., 1860). 8vo. | THE AUTHOR. |
| Gill (Th.) Catalogue of the Fishes of the East Coast of North America from Greenland to Georgia. 8vo. (Philadelphia,) 1861. | THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA. |
| Gistel (J.) Beschreibung des Skeletes des 3-streifigen Nachtäffers (<i>Nyctipithecus trivirgatus</i>). 8vo. Leipzig, 1836. | |
| — Die Mysterien der europäischen Insectenwelt. 12mo. Kempten, 1856. | |
| — Vacuna: oder die Geheimnisse aus der organischen und leblosen Welt. 2 Bände. 8vo. Straubing, 1857. | THE AUTHOR. |
| Grant (R. E.) Tabular View of the Primary Divisions of the Animal Kingdom. 8vo. London, 1861. | THE AUTHOR. |
| Gray (A.) Natural Selection not inconsistent with Natural Theology. (From the Atlantic Monthly Review.) 8vo. London, 1861. | THE AUTHOR. |
| Griffith (J. W.) and Henfrey (A.) Micrographic Dictionary. 2nd edition. 8vo. London, 1860. | (PURCHASED.) |
| Grisebach (A.) Plantæ Wrightianæ e Cuba orientali. Pars 1. 4to. Cantabrigiæ, Nov. Angl., 1860. | F. BOOTT, Esq., M.D., F.L.S. |
| — Erläuterungen ausgewählter Pflanzen des tropischen Amerikas. 4to. Göttingen, 1860. | THE AUTHOR. |
| Grisebach (A. H. R.) Flora of the British West Indian Islands. Parts 3 & 4. 8vo. London, 1860-61. | THE PUBLISHER. |
| Hall (J.) and Whitney (J. D.) Report on the Geological Survey of the State of Iowa. 2 vols. 4to. Iowa, 1858. | THE STATE OF IOWA. |

- | TITLES. | DONORS. |
|---|---|
| Harvey (W. H.) and Sonder (O. W.) <i>Flora Capensis</i> . Vol. 1. 8vo. Dublin, 1859-60. | THE AUTHORS. |
| Haven (C. H.) <i>On the Vine-growing Resources of St. Louis and adjacent Counties of Missouri</i> . 8vo. St. Louis, 1858. | THE AUTHOR? |
| Henderson (E. G.) <i>Illustrated Bouquet</i> , parts 9-11. Fol. London, 1860-61. | MESSRS. HENDERSON & SON. |
| Henslow (Rev. J. S.) <i>Dictionary of Botanical Terms</i> . 12mo. London. | (PURCHASED.) |
| Herbert (W.) <i>Amaryllidaceæ</i> . 8vo. London, 1837. | (PURCHASED.) |
| Herpin (J. C.) <i>Du Raisin, considéré comme Médicament</i> . 12mo. Paris, 1860. | THE AUTHOR. |
| Hewitson (W. C.) <i>Coloured Illustrations of the Eggs of British Birds</i> . 3rd edition. 2 vols. 8vo. London, 1856. | (PURCHASED.) |
| Hoeven (J. van der) <i>Bijdragen tot de ... kennis aangaande Nautilus Pompilius, L.</i> 4to. Amsterdam, 1856. | H. CUMING, Esq., F.L.S. |
| Hogg (J.) <i>On the Distinctions of a Plant and an Animal, and on a Fourth Kingdom of Nature</i> . 8vo. Edinburgh, 1860. | THE AUTHOR. |
| Holböll (C.) <i>Ornithologischer Beitrag zur Fauna Grönlands; übersetzt von J. H. Paulsen, M.D.</i> 8vo. Leipzig, 1854. | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Hooker (J. D.) <i>Introductory Essay to the Flora of New Zealand</i> . 4to. London, 1853. | |
| — <i>On the Flora of Australia, its Origin, Affinities, and Distribution</i> . 4to. <i>Ib.</i> 1859. | LOVELL REEVE, Esq., F.L.S. |
| Hooker (Sir W. J.) <i>Exotic Flora</i> . 3 vols. 8vo. Edinburgh, 1823-27. | (PURCHASED.) |
| — <i>Species Filicum</i> . Vol. 3, parts 3 & 4. 8vo. London, 1860. | THE PUBLISHER. |
| Horner (L.) <i>Address delivered at the Anniversary Meeting of the Geological Society, February 15, 1861</i> . 8vo. London, 1861. | THE SOCIETY. |
| Howard (J. E.) and Fitch (W.) <i>Illustrations of the Nueva Qui-nologia of Pavon</i> , parts 4-9. Fol. London, 1859-61. | J. E. HOWARD, Esq., F.L.S. |
| Huxley (T. H.) <i>Oceanic Hydrozoa: a Description of the Caly-cophoridæ and Physophoridæ observed during the voyage of H.M.S. 'Rattlesnake' in 1846-50</i> . Fol. London, 1859. | R. KIPPIST, Libr. L.S. |

TITLES.	DONORS.
Inzani (G.) e Lemoigne (A.) <i>Sulle origini di varii Fasci Nervosi del Cervello.</i> 4to. Parma, 1861.	THE AUTHORS.
Jones (T. R.) and Parker (W. K.) <i>On the Rhizopodal Fauna of the Mediterranean.</i> 8vo. 1860.	THE AUTHORS.

JOURNALS:—

Annales des Sciences Naturelles. 4^e Série. Zoologie: tome 12, nos. 4-6; tomes 13-15; et tome 16, nos. 1-3. Botanique: tome 12, nos. 4-6; tomes 13 & 14; et tome 15, no. 1. 8vo. Paris, 1859-61. (PURCHASED.)

Annals and Magazine of Natural History. 3rd Series, nos. 31-48. 8vo. London, 1860-61. W. FRANCIS, Ph.D., F.L.S.

Archiv für Naturgeschichte; von A. F. A. Wiegmann, W. F. Erichson, &c. Jahrgang 25, Heft 6; 26, Hefte 1-5; und 27, Hefte 1 & 2. 8vo. Berlin, 1859-61.

—— — Register zu den ersten 25 Jahrgängen; von Dr. F. H. Troschel. 8vo. *Ib.* 1860. (PURCHASED.)

Botanical Magazine: edited by Sir W. J. Hooker, K.H., F.R.S. & L.S. 3rd Series, nos. 187-204. 8vo. London, 1860-61. (PURCHASED.)

Botanische Zeitung: herausgegeben von Hugo von Mohl und Dr. F. L. von Schlechtendal. Jahrg. 1-17. 4to. Berlin und Leipzig, 1843-59. (PURCHASED.)

Canadian Journal of Industry, Science, and Art. New Series, nos. 28-32, 34 & 35. 8vo. Toronto, 1860-61.

THE CANADIAN INSTITUTE.

Field Naturalist: edited by James Rennie, M.A., A.L.S. Vol. 1, and vol. 2, nos. 1-4. 8vo. London, 1833-34.

EXECUTORS OF THE LATE J. D. SALMON, Esq., F.L.S.

Gardeners' Chronicle and Agricultural Gazette: the Horticultural part edited by Dr. Lindley. Nos. 26-52 for 1860, and nos. 1-52 for 1861. Fol. London. (PURCHASED.)

Ibis; a Magazine of General Ornithology: edited by P. L. Sclater, Esq., M.A., F.L.S., Sec. Z.S., &c. Nos. 7 & 8. 8vo. London, 1860. THE EDITOR.

Journal de Conchyliologie; par MM. Fischer et Bernardi. 2^e Série, tome 4, nos. 2-4. 8vo. Paris, 1860. H. CUMING, Esq., F.L.S.

Journal of Entomology; descriptive and geographical. Vol. 1, no. 2. 8vo. London, 1860. THE PROPRIETORS.

Literary Gazette. New Series, nos. 106-182. 4to. London, 1860-61. THE PUBLISHERS.

- | TITLES. | DONORS. |
|--|---|
| JOURNALS (<i>continued</i>):— | |
| London Review. Nos. 31–37, and 39–78. Fol. London, 1861. | THE PUBLISHERS. |
| Malakozologische Blätter; von Dr. Menke und Dr. Pfeiffer. Bände 1–5. 8vo. Cassel, 1854–58 (als Fortsetzung der Zeitschrift für Malakozologie). | H. CUMING, Esq., F.L.S. |
| Natural History Review, and Quarterly Journal of Science: edited by A. H. Haliday, M.A., W. H. Harvey, M.D., &c. Vols. 5–7. 8vo. London, 1858–60. | |
| THE DUBLIN UNIVERSITY ZOOLOGICAL AND BOTANICAL ASSOCIATION. | |
| Natural History Review, and Quarterly Journal of Biological Science: edited by G. Busk, F.R.S., W. B. Carpenter, M.D., F.R.S., &c. Vol. 1. 8vo. London, 1861. (PURCHASED.) | |
| Naturalist; by Neville Wood, Esq. Vols. 2–5. 8vo. London, 1837–39. | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Nederlandsch Kruidkundig Archief: onder Redactie van W. H. De Vriese, &c. Deel 5, stuk 1 & 2. 8vo. Amsterdam, 1860–61. | THE EDITORS? |
| Philosophical Magazine and Journal of Science. 4th Series, nos. 130–150. 8vo. London, 1860–61. | W. FRANCIS, Ph.D., F.L.S. |
| Phytologist. New Series, nos. 61–80. 8vo. London, 1860–61. | W. PAMPLIN, Esq., A.L.S. |
| Quarterly Journal of Microscopical Science: edited by E. Lankester, M.D., F.R.S. & L.S., and G. Busk, Esq., F.R.S., Sec. L.S. Nos. 32 & 33. 8vo. London, 1860. | |
| —— New Series, nos. 1–4. 8vo. <i>Ib.</i> 1861. | THE MICROSCOPICAL SOCIETY. |
| Revue et Magasin de Zoologie; par F. E. Guérin-Méneville. 2 ^e Série, tomes 11 & 12. 8vo. Paris, 1859–60. | H. CUMING, Esq., F.L.S. |
| Walpers. Annales Botanices systematicæ. Tom. 5, fasc. 5 & 6, et tom. 6, fasc. 1: auctore Dr. Car. Müller. 8vo. Lipsiæ, 1860–61. | (PURCHASED.) |
| Zeitschrift für Malakozologie: herausgegeben von Dr. K. Th. Menke und Dr. L. Pfeiffer. Jahrg. 10. 8vo. Cassel, 1853. (<i>For continuation v. Malakozool. Blätter.</i>) | H. CUMING, Esq., F.L.S. |
| Karsten (H.) Das Geschlechtsleben der Pflanzen und die Parthenogenesis. 4to. Berlin, 1860. | THE AUTHOR. |
| Klotzsch (F.) Die Aristolochiaceæ des Berliner Herbariums. 8vo. Berlin, 1859. | H. CUMING, Esq., F.L.S. |

- | TITLES. | DONORS. |
|--|---|
| [Knapp (J. L.)] Journal of a Naturalist. 3rd edition. 8vo. London, 1830. | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Kölliker (A.) Ueber das Ende der Wirbelsäule der Ganoiden, und einiger Teleostier. 4to. Leipzig, 1860. | THE AUTHOR? |
| Kotschy (Th.) Die Eichen Europa's und des Orient's. Lief. 5 & 6. Fol. Wien, &c., 1859-61. | T. C. JANSON, Esq., F.L.S. |
| Krombholz (J. V.) Naturgetreue Abbildungen und Beschreibungen der essbaren, schädlichen und verdächtigen Schwämme. (Hefte 1-10.) Fol. Prag, 1831-46, with an Atlas of 76 plates. | (PURCHASED.) |
| Kützing (F. T.) Phycologia Generalis ; oder Anatomie, Physiologie und Systemkunde der Tange. 4to. Leipzig, 1843. | (PURCHASED.) |
| Lankester (E.) On Food ; being Lectures delivered at the South Kensington Museum. 8vo. London, 1861. | THE AUTHOR. |
| Lea (I.) Observations on the genus <i>Unio</i> . Vol. 7 (parts 1 & 2). 4to. Philadelphia. | |
| — Descriptions of new species of <i>Unionidæ</i> . 8vo. Philadelphia, 1860. | H. CUMING, Esq., F.L.S. |
| Ledebour (C. F. a) Flora Rossica : s. Enumeratio Plantarum totius Imperii Rossici. Voll. 1-4. 8vo. Stuttgartiæ, 1842-53. | (PURCHASED.) |
| Lees (J.) The Six Months' Seasons of the Tropics. 12mo. London, 1860. | THE AUTHOR. |
| Leighton (W. A.) Flora of Shropshire. 8vo. London, 1841. | |
| | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| — British species of Angiocarpous Lichens. 8vo. London, 1851. | R. KIPPIST, Libr. L.S. |
| Le Jolis (A.) Plantes Vasculaires des environs de Cherbourg. 8vo. Paris, 1860. | THE AUTHOR. |
| Lewes (G. H.) Sea-side Studies at Ilfracombe, Tenby, the Scilly Isles, and Jersey. 8vo. Edinburgh, 1858. | |
| | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Lindsay (W. L.) The Eruption, in May 1860, of the Kötlugjá Volcano, Iceland. 8vo. Edinburgh, 1861. | THE AUTHOR. |
| Lovén (S.) Om några i Vettern och Venern funna Crustaceer. 8vo. 1860. | THE AUTHOR. |
| Lowe (E. J.) Natural History of Ferns, British and Exotic. Parts 119 & 120. 8vo. London, 1860. | |
| — Natural History of new and rare Ferns. Parts 1-14. 8vo. <i>Ib.</i> 1860-61. | THE AUTHOR. |

- | TITLES. | DONORS. |
|---|---|
| Lowe (E. J.) Beautiful-leaved Plants. Parts 9–14. 1860. | 8vo. London,
THE AUTHOR. |
| Lubbock (J.) Notes on the Generative Organs, and on the Formation of the Egg in the <i>Annulosa</i> . Part 1. 1861. | 8vo. 1861.
THE AUTHOR. |
| Malherbe (A.) Faune Ornithologique de la Sicile. 1843. | 8vo. Metz,
EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Mantell (G. A.) Wonders of Geology. 2nd edition. 1838. | 2 vols.
12mo. London, 1838. |
| — Thoughts on Animalcules. 1846. | 8vo. London, 1846.
EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Marcotte (F.) Les Animaux Vertébrés de l'arrondissement d'Abbeville. 1860. | 8vo. Abbeville, 1860. SIR CHARLES LYELL, F.R. & L.S. |
| Martius (C. F. P. von) Denkrede auf Alexander von Humboldt. 1860. | 4to. München, 1860.
THE ROYAL ACADEMY OF SCIENCES, MUNICH. |
| Möller (H. P. C.) Index Molluscorum Grœnlandiæ. 1842. | 8vo. Hafniæ, 1842.
H. CUMING, Esq., F.L.S. |
| Montagu (G.) Ornithological Dictionary of British Birds. 2nd edition, by James Rennie, A.M., A.L.S. 1831. | 8vo. London, 1831.
EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Moore (T.) Index Filicum. Parts 5–16. 1857–61. | 12mo. London, 1857–61.
THE PUBLISHER. |
| Mörch (A. A. L.) Fortegnelse over Grønlands Blød-dyr (Prodromus Faunæ Molluscorum Grœnlandiæ). 1857. | 8vo. Kjobenhavn, 1857.
H. CUMING, Esq., F.L.S. |
| Moris (J. H.) Flora Sardoæ. Vol. 3. 1858–59. | 4to. Taurini, 1858–59.
THE AUTHOR. |
| Mousson (A.) Coquilles terrestres et fluviatiles, recueillies dans l'Orient par M. le Dr. Alex. Schlæfli. 1859. | 8vo. Zurich, 1859.
H. CUMING, Esq., F.L.S. |
| Müller (Ferd.) Fragmenta Phytographiæ Australiæ. Fasc. 14. 1860. | 8vo. (Melbourne), 1860. |
| — Essay on the Plants collected by Mr. Eugene Fitzalan during Lieut. Smith's expedition to the estuary of the Burdekin. 1860. | Fol. Melbourne, 1860.
THE AUTHOR. |
| Newman (E.) The Insect Hunters, and other poems. 1861. | 2nd edition.
12mo. London, (1861).
THE AUTHOR. |
| Norman (J. M.) Quelques observations de Morphologie Végétale faites au Jardin Botanique de Christiania. 1857. | 4to. Christiania, 1857.
THE ROYAL UNIVERSITY OF CHRISTIANIA. |

- | TITLES. | DONORS. |
|---|---|
| Nylander (W.) Synopsis methodica Lichenum, omnium hucusque cognitorum: fasc. 2. 8vo. Parisiis, 1860. | J. D. HOOKER, M.D., F.R. & L.S. |
| Oken (L.) Elements of Physiophilosophy: translated by Alfred Tulk. 8vo. London, 1847. | R. KIPPIST, Libr. L.S. |
| Owen (R.) Palæontology; or a Systematic Summary of Extinct Animals and their Geological Relations. 2nd edition. 8vo. Edinburgh, 1861. | THE AUTHOR. |
| Pfeiffer (L.) Novitates Conchologicæ. Series 1. <i>Mollusca extramarina</i> , tom. 1. 4to. Cassel, 1854-60. | H. CUMING, Esq., F.L.S. |
| Prime (T.) Synonymy of the Family <i>Cyclades</i> . (Proc. Acad. Sc. Philad. 1860.) 8vo. | H. CUMING, Esq., F.L.S. |
| Ratzeburg (J. T. C.) Die Waldverderber und ihre Feinde. 4 ^{te} Auflage. 8vo. Berlin, 1856. | W. W. SAUNDERS, Esq., V.P.L.S. |
| Reeve (L.) Elements of Conchology. Parts 15 & 16. 8vo. London, 1860. | |
| — Conchologia Iconica: Monographs of the genera <i>Anculotus</i> , <i>Argonauta</i> , <i>Aspergillum</i> , <i>Cymbium</i> , <i>Hemisinus</i> , <i>Io</i> , <i>Lingula</i> , <i>Melania</i> , <i>Melanopsis</i> , <i>Melatoma</i> , <i>Myochama</i> , <i>Nautilus</i> , <i>Pirena</i> , <i>Scarabus</i> , <i>Terebra</i> , <i>Terebratula</i> , <i>Thracia</i> , and <i>Trigonia</i> . 4to. London, 1860-61. | THE AUTHOR. |
| Regel (E.) Monographia Betulacearum hucusque cognitarum. 4to. Mosquæ, 1861. | THE AUTHOR. |
| Ruiz (H.) et Pavon (J.) Flora Peruviana et Chilensis. Tomus 3. Folio. (Matriti), 1802. | R. KIPPIST, Libr. L.S. |
| Sars (M.), Koren (J.), et Danielssen (D. C.) Fauna Littoralis Norvegiæ. Livr. 2. 4to. Bergen, 1856. | G. BUSK, Esq., F.R.S., Sec. L.S. |
| Schlegel (H.) Kritische Uebersicht der Europäischen Vögel. 8vo. Leiden, 1844. | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Schwartz von Mohrenstern (G.) Ueber die Familie der Rissoiden. 4to. Wien, 1860. | H. CUMING, Esq., F.L.S. |
| Seba (A.) Rerum Naturalium Thesaurus. Tomi 4. Fol. Amstelædami, 1734-65. | (PURCHASED.) |
| Shortt (J.) Essay on the Culture and Manufacture of Indigo. 8vo. Madras, 1860. | THE AUTHOR. |
| Sowerby (G. B.) Thesaurus Conchyliorum. Part 20. 8vo. London, 1860. | (PURCHASED.) |
| Stainton (H. T.) <i>Ed.</i> Entomologist's Annual for 1861. 12mo. London, 1861. | THE EDITOR. |

- | TITLES. | DONORS. |
|---|-------------------------|
| Stainton (H. T.) &c. Natural History of the Tineina. Vols. 5 & 6.
8vo. London, 1860-61. | THE AUTHOR. |
| Steenstrup (J. J. S.) Hectocotyldannelsen hos Octopodslægterne
Argonauta og Octopus. 4to. Kjobenhavn, 1856. | H. CUMING, Esq., F.L.S. |
| Steudel (E. G.) Synopsis Plantarum Glumacearum. Pars 1.
<i>Gramineæ</i> . Pars 2. <i>Cyperaceæ</i> , &c. 8vo. Stuttgartiæ, 1855. | (PURCHASED.) |
| Suckley (George) Notices of certain new species of North Ame-
rican <i>Salmonidæ</i> , chiefly in the collection of the N.W. Boundary
Commission. 8vo. (New York), 1861. | THE AUTHOR? |
| Swallow (G. C.) Geological Report of the country along the S.W.
Branch of the Pacific Railroad, Missouri. 8vo. St. Louis, 1859. | THE AUTHOR? |
| Taylor (Alex. S.) Californian Notes. Condors of Chili and Cali-
fornia. Nos. 1-7. (From the California Farmer.) | THE AUTHOR. |
| Tenore (M.) Catalogo del Real Orto Botanico di Napoli. 4to.
Napoli, 1845. | |
| — Sopra alcune specie di Cipressi. 4to. Modena, 1853. | |
| — Su di una pianta Conifera del genere <i>Taxodium</i> . 4to. <i>Ib.</i>
1853. | THE AUTHOR. |
| Thwaites (G. H. K.) and Hooker (J. D.) Enumeratio Plantarum
Zeylanicæ. Parts 3 & 4. 8vo. London, 1860-61. | THE AUTHORS. |
| Torell (O.) Bidrag till Spitsbergens Molluskfauna. 8vo. Stoök-
holm, 1859. | H. CUMING, Esq., F.L.S. |
| Treviranus (L. C.) In Hyperici genus ejusque species animadver-
siones. 4to. Bonnæ, 1861. | THE AUTHOR. |
| Wallich (G. C.) Notes on the presence of Animal Life at vast
depths in the Sea. 8vo. (London), 1860. | THE AUTHOR. |
| Watson (H. C.) Supplement to the Cybele Britannica. Part 1.
8vo. London, 1860. | THE AUTHOR. |
| Weddell (H. A.) Chloris Andina. (Vol. 2), livr. 12-14. 4to.
Paris, 1860. | |
| — Mémoire sur le <i>Cynomorium coccineum</i> , parasite de l'ordre
des Balanophorées. 4to. <i>Ib.</i> 1860. | THE AUTHOR. |
| Welwitsch (Fred.) Apontamentos phytogeographicos sobre a Flora
da Provincia de Angola na Africa Equinocial, servindo de Rela-
torio preliminar da Exploração Botanica da mesma Provincia.
(Annacs do Conselho Ultramarino. Ser. 1, Dezembro 1858.)
4to. | THE AUTHOR. |

- | TITLES. | DONORS. |
|--|--|
| Williamson (W. C.) On the Recent Foraminifera of Great Britain.
Fol. London, 1858. | R. KIPPIST, Libr. L.S. |
| Willis and Sotheran. Catalogue of upwards of 50,000 volumes of
Ancient and Modern Books. 8vo. London, 1862. | MESSRS. WILLIS AND SOTHERAN. |
| Willkomm (M.) Icones et descriptiones Plantarum novarum,
&c., Europæ Austro-occidentalis, præcipuè Hispaniæ, tomus 1,
(fasc. 1-10). 4to. Lipsiæ, 1852. | THOMAS BELL, Esq., V.P.L.S. |
| Wilson (A.) and Bonaparte (C. L.) American Ornithology:
edited by Robert Jameson, Esq., F.R.S. & L.S. 4 vols. 12mo.
Edinburgh, 1831. | EXECUTORS OF J. D. SALMON, Esq., F.L.S.* |
| Wilson (W.) Bryologia Britannica, containing the Mosses of
Great Britain and Ireland. 3rd edition. 8vo. London, 1855. | (PURCHASED.) |
| Wollaston (T. V.) Insecta Maderensia; being an account of the
Insects of the Islands of the Madeiran group. 4to. London,
1854. | (PURCHASED.) |
| Wood (N.) Ornithologist's Text-Book. 12mo. London, 1836. | EXECUTORS OF J. D. SALMON, Esq., F.L.S. |
| Yates (J.) and Barrett (Rev. A.) Improvements in Arithmetic,
with a Vindication of the Decimal Principle. 8vo. London,
1860. | THE AUTHORS. |

DONATIONS

TO THE

MUSEUM OF THE LINNEAN SOCIETY.

[Continued from vol. v. page lvi.]

DONATIONS.

DONORS.

- An extensive and valuable Collection of Birds' Eggs. Bequeathed by the late J. D. SALMON, Esq., F.L.S.
- Dried specimens of Plants from the Upper Himalaya. Collected and presented by J. D. HOOKER, Esq., M.D., F.R.S. & L.S., and THOMAS THOMSON, Esq., M.D., F.R.S. & L.S.
- Specimens of about 40 species of Canadian Woods (cut and polished). THE COMMISSIONERS OF CROWN LANDS, CANADA.
- Specimens of *Carex Ericetorum*, Poll., from the Gog-magog Hills, near Cambridge. C. C. BABINGTON, Esq., M.A., F.R. & L.S.
- Specimens of the Fruit and Seeds of a new species of Couratari from Bolivar, New Granada. M. ANTHOINE.

INDEX TO THE PROCEEDINGS.

Page	Page		
Additions to the Library, received from July 1, 1860, to December 31, 1861	cix	Boott, Dr., Vote of Thanks to, on retiring from the office of Treasurer	xliv
Address of Condolence to Her Majesty on the Death of H.R.H. the Prince Consort	lvii	Busk, G., Notice of the skull of a child, from the W. Coast of Africa	v
Address, President's, May 24, 1861	x	Bust of the late Robert Brown, Esq., Pres. L.S., Presentation of	liii
—, —, May 24, 1862	lxvi	Bye-laws, Alterations in	iv, v
Anamallay Mountains, Notes on the Exogenous Flora of, by Capt. R. H. Beddome	lxv	Cameroon Mountains, Ascent of, by Mr. G. Mann	cvi
Anniversary Meeting, May 24, 1861, Report of the	x	— — —, On the Vegetation of, by Dr. Hooker	cvi
— — —, May 24, 1862	lxvi	Cavanillesia from New Carthagena (<i>C. platanifolia</i> , <i>H. & B.?</i>), Notice of, by G. Bentham	iii
Aquilaria Agallocha, <i>R.</i> , Notice of the Resinous wood of, by Mr. D. Hanbury	lv	Cinchonæ, Mr. Markham's Letter in reference to the cultivation of, in India and Ceylon	lviii
Araucaria Rulei, <i>F. Müll.</i> , a new species, from a volcanic islet off New Caledonia, exhibited by Dr. Hooker	iv	Cinclidium stygium, exhibited, from Tuddenham Heath	ii
Axolotl, Specimen of, from Mexico, exhibited by Mr. H. Christy	cvii	Cobbold, Dr. T. S., On the occurrence of <i>Gyrodactylus elegans</i> in the Serpentine	lv
Babington, C. C., Note on <i>Isoëtes echinospora</i> , Dur.	lxiii	Cœlebogyne ilicifolia, exhibited by R. Heward	vi
—, On the discovery of <i>Isoëtes Hystrix</i> in Guernsey	iii	Cooke, R. B., On the occurrence of <i>Maianthemum bifolium</i> at Harkness	liv
Beddome, Capt. R. H., Notes on the Exogenous Flora of the Anamallay Mountains, in S. India	lxv	Donations to the Museum	cxxxii
Bell, Professor, Vote of Thanks to, on his retirement from the office of President	xlvi	Egg within an Egg, Note on, by J. Hogg	ix
Bentham, G., Notice of a <i>Cavanillesia</i> (<i>C. platanifolia</i> , <i>H. & B.?</i>) from the neighbourhood of New Carthagena	iii	Engrafting, Cambodian mode of	iii
—, Note on <i>Omphalocarpon procerum</i> , P. de B.	viii	Garner, R., Note on the Formation of Pearls	lvi
Berkeley, Rev. M. J., On the spiral markings of the Flocci of the genus <i>Trichia</i>	lxv	Gyrodactylus elegans, Dr. Cobbold on the occurrence of, in the Serpentine	lv
Birds' Eggs, &c., the late J. D. Salmon's collection, presented	liv	Gyrostemon attenuatus, exhibited	vi
		Hogg, J., Note on an Egg within an Egg	ix
		—, Note on Rope made of Tree-Mallow-fibre	ix
		Hooker, Dr. J. D., On the Vegetation of the Cameroons	cvi

	Page		Page
Hooker, Dr. J. D., Account of <i>Welwitschia mirabilis</i>	lix	OBITUARY NOTICES (<i>cont.</i>):—	
Hyalonema mirabilis, exhibited by Prof. Huxley	1	Hoblyn, Thomas	xli
Insects, Indian, A Collection of, together with drawings illustrative of their transformations, exhibited by General Sir J. B. Hearsey, C.B.	1	Hope, Rev. Frederick William	xc
Isoëtes echinospora, <i>Dur.</i> , C. C. Babington on	lxiii	Hurst, Robert Charles	xciii
— Hystrix, discovery of, in Guernsey	iii	Kelaart, Edward F., M.D.	xli
Lubbock, J., Notes on the Anatomy of the <i>Smynthuridæ</i>	lix	Mackay, Jas. Townsend, LL.D.	cv
—, Notes on <i>Sphærulearia Bombi</i>	ii	Perkins, Frederick	xlii
Macdonald, Dr. W., On the Classification of the Warm-blooded <i>Vertebralia</i> , and their parallelism	lxv	Plomley, Francis, M.D.	xlii
Maianthemum bifolium, R. B. Cooke on the occurrence of, at Harkness	liv	Probart, Francis George, M.D.	xliv
Mann, G., Letter to Sir W. J. Hooker, giving an account of his ascent of the Cameroon Mountains	cvi	Quekett, John Thomas	xciii
Markham, C. R., Letter in reference to the cultivation of <i>Cinchonæ</i> in India and Ceylon	lviii	Quigley, Thos. Haswell, M.D.	xciv
Meeting, Anniversary, May 24, 1861, Report of the	x	Rigby, Edward, M.D.	xlv
—, —, May 24, 1862	lxvi	Ross, Sir James Clark	xciv
Megacarpæa polyandra, flowering specimen of, exhibited	vi	Sinclair, Andrew, M.D.	xcv
Mouhot, H., on the Cambodian mode of engrafting	iii	Somerville, William, M.D.	xlv
OBITUARY NOTICES:—		Tiedemann, Friedrich, M.D.	ci
H. R. H. the Prince Consort	lxxxiii	Wilkinson, J. Sheldon Cradock	xcvi
H. M. Pedro V., King of Portugal	lxxxiii	Young, James Forbes, M.D.	xlv
Aberdeen, Earl of	xx	Omphalocarpon procerum, <i>P. de B.</i> , Note on, by G. Bentham	viii
Ashton, Robert John	xx	Pearls, R. Garner on the Formation of	lvi
Barnard, Edward	lxxxv	President's Address, May 24, 1861	x
Barnes, Philip Edward, B.A.	xxi	— —, May 24, 1862	lxvi
Blume, Charles Louis, M.D.	xcvi	Proteus anguinus, from Adelsberg, exhibited by Mr. Christy	cvii
Borrer, William	lxxxv	Receipts and Payments of the Linnean Society from May 1, 1860, to April 30, 1861	lii
Charlwood, George	xc	— — from May 1, 1861, to April 30, 1862	cviii
Clark, Bracy	xxi	Silk-moth of the Deccan, Cocoons exhibited by Dr. Carpenter	1
Duméril, André Marie Constant	xlvi	Singing Mice, Note on the habits of, by Miss Drew	ii
Fitton, William Henry, M.D.	xxiv	Skull of a child from Fernando Po, Notice of, by G. Busk	v
Forbes, James	civ	Smynthuridæ, J. Lubbock on the Anatomy of the	lix
Geoffroy St.-Hilaire, Isidore	xcviii	Sphærulearia Bombi, Notes on, by J. Lubbock	ii
Hambrough, Albert John	xc	Tree-Mallow-fibre, Note on, by J. Hogg	ix
Henslow, Rev. John Stevens	xxv	Trichia, On the spiral markings of the Flocci in	lxv
		Vertebralia, Warm-blooded, On the Classification of, and their parallelism, by Dr. W. Macdonald	lxv
		Welwitschia mirabilis, Account of, by Dr. J. D. Hooker	lix
		— —, Young specimens with undivided leaves, exhibited	cvii
		Woolfs, W., Glance at the Botany of the North Shore, Sydney	v

JOURNAL OF THE PROCEEDINGS
OF THE
LINNEAN SOCIETY OF LONDON.

On the Vegetation of Clarence Peak, Fernando Po; with Descriptions of the Plants collected by Mr. GUSTAV MANN on the higher parts of that Mountain. By J. D. HOOKER, Esq., M.D., F.R.S., F.L.S., &c.

[Read March 7th, 1861.]

A KNOWLEDGE of the temperate flora of any spot on the west coast of Tropical Africa has long been one of the greatest desiderata in botanical geography, not only on account of the intrinsic interest that must attach to the plants of the extremely few isolated points so elevated as to possess a temperate climate in that vast humid and torrid area, but also from the light such plants might be expected to throw on the floras of St. Helena, the Cape de Verd, and the Canaries; all of which (and especially the former) contain peculiar endemic genera, whose nearest allies might be expected to exist on the mountains of the neighbouring continent.

Within the last year the outlines of such a desiderated flora have been supplied by the energy and resolution of Mr. Gustav Mann, of the Royal Gardens, Kew, who was appointed by Lord John Russell (Foreign Minister) to succeed the late lamented Barter, as botanist to Dr. Baikie's Niger Expedition, but who, being unable to ascend the river and join that expedition, has devoted a year and a half to exploring the island of Fernando Po, and has twice reached its lofty summits, 10,700 feet above the sea; on both occasions collecting indefatigably and preserving his collections well.

Mr. Mann's account of the first of these ascents has already been read before the Society; he commenced the expedition on the 23rd March, 1860, and reached the summit on the 3rd April, where the temperature fell to 39° at night. The return was accomplished on the 13th of the same month. A second ascent was attempted on the 7th of November, and after eighteen days he had nearly reached the top, when his men rebelled, and he was obliged to return to Clarence. He started a third time, and reached the summit in December, but the dates and detailed narrative of this ascent have not yet arrived.

The following notes chiefly refer to the temperate plants, all but one of which (*Sanicula Europæa*) were collected at or above 5000 feet elevation. They amount to 76 species (in 66 genera), a singularly small number for 5700 feet of vertical height almost under the equator. Of these fully 20 are tropical types that ascend a little above 5000 feet, and must be excluded from the temperate flora. The remaining 56 belong to no fewer than 45 genera; proving the flora to be an extremely fragmentary one.

Of the total 76, 37 are Abyssinian species, and 16 others closely allied to such; and of the 56 temperate, 32 are also natives of the mountains of Abyssinia, most of them being absolutely specifically identical, and others but slightly differing; such differences being in some cases doubtless apparent rather than real, and owing to the want of a larger suite of specimens; 13 others also are very closely allied to Abyssinian species.

Again, of the Abyssinian mountain plants common to Clarence Peak, no fewer than 17 are absolutely peculiar to these two localities as far as is at present known, including some very remarkable plants; as

<i>Clematis Simensis</i>	<i>Stachys aculeolata</i> , n. sp.
<i>Thalictrum rhynchocarpum</i>	<i>Pycnostachys Abyssinica</i>
<i>Sagina Abyssinica</i>	<i>Calamintha Simensis</i>
<i>Trifolium subrotundum</i>	<i>Cyanotis Abyssinica</i> ?
— <i>Simense</i>	<i>Kyllingia macrocephala</i>
<i>Helichrysum chrysocoma</i>	<i>Trisetum lachnanthum</i>
— <i>Hochstetteri</i>	<i>Festuca Schimperiana</i>
— <i>globosum</i>	<i>Gymnandropogon</i> , sp.
<i>Blæria spicata</i>	

Besides these are the following, which are not found south of Abyssinia in Africa:—

<i>Galium rotundifolium</i>	<i>Deschampsia cæspitosa</i>
<i>Parietaria Mauritanica</i>	<i>Brachypodium sylvaticum</i> .

Others are common to Abyssinia, the Mauritius, Madagascar, &c. : as

Viola Abyssinica	Rubus apetalus
Hypericum angustifolium	Carex Boryana.
Geranium Simense	

There are, again, other species whose only near affinities are with Abyssinian : as species of

Agrocharis	Plectranthus
Gymnosciadium?	Veronica
Dichrocephala	Euphorbia
Swertia	Habenaria.

Extending the comparison to genera, I find that of the 66 Clarence Peak genera only 7 are not Abyssinian, and of the 45 temperate genera 41 are temperate Abyssinian. Of the 3 remaining, *Luzula* and *Schoenus* may yet be found in Abyssinia, and *Leucothoe* is a Mauritius plant.

The next affinity is with Mauritius, Bourbon, and Madagascar : of the whole 76 species, 16 inhabit these places, and 8 more are closely allied to plants from there. Three temperate species are peculiar to Clarence Peak and the East African Islands, including *Leucothoe angustifolia*, *Sebæa brachyphylla*, and *Carex Wahlenbergiæ*. *Ericinella* and *Leucothoe* are the only genera not Abyssinian, which are common to these islands and to Fernando Po.

Lastly, if compared with the Cape, the contrast is very striking : not only is there a total want of any true Cape types, except such few as are common to Abyssinia or the Eastern African Islands (5 species), but only 12 of the 76 Fernando Po species are known to be South African ; and of these all but *Luzula* have been also found in Abyssinia. Only 12 others are nearly related to South African forms. Turning to the genera, *Peddiea* is the only peculiarly South African one ; and this is not temperate at Fernando Po, and is subtropical in South Africa.

Hence the result of comparing the Clarence Peak flora with that of the African continent is—1. The intimate relationship with Abyssinia, of whose flora it is a member, and from which it is separated by 1800 miles of absolutely unexplored country* ; 2. the curious relationship with the East African Islands, which are still further off ; 3. the almost total dissimilarity from the Cape flora.

* This result is strongly in favour of the existence of a chain of mountains crossing Central Africa, from Abyssinia to the Cameroons Mountains, of whose probable existence M. du Chaillu has recently procured evidence.

With the West African Islands again, contrary to my expectations, there is no marked relationship whatever, except obscurely with St. Helena through *Wahlenbergia arguta*: the arborescent *Compositæ* and *Lobeliaceæ*, *Phyllicæ*, *Melhanicæ*, *Frankenia*, *Acalypha*, and frutescent *Heydotis* of St. Helena, being wholly unrepresented in Fernando Po.

Taking a still wider range, the temperate flora of Fernando Po belongs to the northern hemisphere. Of the 48 temperate genera, 12 only are not European; whilst the following species are European, and most of them British:—

<i>Oxalis corniculata</i>	<i>Parietaria Mauritanica</i>
<i>Sanicula Europæa</i>	<i>Luzula campestris</i>
<i>Galium Aparine</i>	<i>Deschampsia cæspitosa</i>
— rotundifolium	<i>Brachypodium sylvaticum.</i>
<i>Limosella aquatica</i>	

The two following are also probably states of European plants:—*Ranunculus pinnatus*, very near *R. philonotis*; *Calamintha Simensis*, near *vulgaris*.

RANUNCULACEÆ,

Of this Order, which is very far from well-represented, even in the temperate and alpine regions of Tropical and Southern Africa, three genera, each containing a single species, were collected by Mr. Mann on Clarence Peak. All are Abyssinian; one only, and that a plant of very wide distribution, is South African also.

1. *Clematis Simensis*, *Fresen*; *Rich. Fl. Abyss. i. 3.*

Hab. In Clarence Peak, alt. 4–8000 ped. (fl. Nov.)—Alte scandens, 120-pedalis! Flores albi.

The flowers are a little smaller than the Abyssinian specimens. A. Richard describes this species as glaucous in all its parts, but such is not the case in all our authentically named specimens, nor in these from Fernando Po, which have also more membranous foliage; such differences are what the more humid climate of West Tropical Africa would lead us to expect. The lower parts of the filaments are also rather more silky in Mann's specimens, but this is a variable character. I have no fruiting individuals. This species is found throughout Abyssinia at 8000 feet elevation.

2. *Thalictrum rhynchocarpum*, *Quart. Dill. & Rich.*; *Rich. Fl. Abyss. i. 3.*

Hab. In Clarence Peak, alt. 10,000 ped.

Herba 12-pedalis. Fl. virides. Stamina numero varia, interdum plurima.

A most remarkable species, and quite unlike any other hitherto described. A. Richard rightly characterizes it as one of the best-marked species of the genus. Mann's specimens are in flower only, and have the pinnules sometimes a little more divided than in Abyssinian ones; it is not uncommon in mountain woods of Abyssinia.

3. *Ranunculus pinnatus*, Poir., var. *extensa* carpellis lævibus.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Caules graciles, elongati, flexuosi, interdum ad nodos radicanter. *Folia* longe et gracile petiolata, pinnata v. biternata, foliolis longe petiolulatis.

This in every respect agrees with *R. pinnatus*, Poir, of Southern Africa, except in its more drawn-out habit (a feature doubtless attributable to the climate of Fernando Po), and the total absence of any tubercles on the carpels. This last, however, is a variable character, and often wanting in the very closely allied *R. philonotis*, Retz., of Europe, which, with the present and some other plants of India and America, will, I suspect, ultimately prove to belong to one collective, widely diffused species.

MENISPERMEÆ.

1. *Stephania hernandifolia*, Wall.; *H. f. & T. Flor. Ind.* i. 196. cum Syn.

Hab. In Clarence Peak, alt. 3-5000 ped. (fl. Dec.)

Identical with the Indian plant, which is also a native of various parts of Tropical and Southern Africa, Java, and Australia.

VIOLARIÆ.

1. *Viola Abyssinica*, Steud., var. *impunctata*.

Hab. In Clarence Peak, alt. 10,000 ped. (fl. April.)

Caules repentes, elongati, hic illic radicanter. *Folia* impunctata. *Flores* pallide purpurei.

Except in wanting the oblong brown maculæ on the foliage, I can find no distinction whatever between this and the plant of Abyssinia, where as at Fernando Po, it grows in the region of heaths. It is also found in Madagascar with unspotted foliage.

PITTOSPOREÆ.

1. *PITTIOSPORUM MANNII*, *H. f.* Foliis elliptico-lanceolatis utrinque attenuato-acuminatis margine undulatis, paniculis ramosis multifloris puberulis, floribus parvis, capsula parva latissime obovoidea.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Frutex 20-pedalis. *Folia* petiolata, glaberrima, $2\frac{1}{2}''$ - $3\frac{1}{2}''$ long., utrinque viridia, glaberrima. *Panicula* subpyramidalis, $1\frac{1}{2}''$ long., erecta, ramis erecto-patentibus. *Flores* $\frac{1}{5}''$ long., flavi; sepalis basi connatis, acutis, glabriusculis petalis obtusis dimid. brevioribus; ovario staminibusque glaberrimis. *Capsula* (unica tantum visa) $\frac{1}{4}''$ long., $\frac{1}{3}''$ lata, basi abrupte angustata, apice retusa.

Allied to *P. Abyssinicum*, Hochst., which has generally obtuse leaves; and more closely still to the Mauritius *P. Senacia*, Putt., but differing from both in the erect paniculate inflorescence, smaller flowers and very different capsule.

CARYOPHYLLÆ.

1. *Sagina Abyssinica*, *Hochst.*; *Rich. Fl. Abyss.* i. 47.

Hab. In Clarence Peak, alt.? (fl. Dec.)

This is absolutely identical with the Abyssinian plant, and is a very distinct species from any other. The flowers are often tetramerous. The only other Fernando Po plant of this order is *Drymaria cordata*, W., which grows at low levels.

HYPERICINÆ.

1. *Hypericum angustifolium*, *Lamk.*; *DC. Prodr.* i. 545.

H. leucoptychodes, *Steud.*; *Rich. Fl. Abyss.* i. 96.

Hab. In Clarence Peak, 7-10,000 ped. copiosissime. (fl. Dec.)

Arbuscula 30-pedalis. *Folia* interdum et *sepala* secus marginem punctata, sæpius omnia impunctata.

The Bourbon specimens of this noble plant have the leaves rather narrower than the Abyssinian, and wholly impunctate. In both the Fernando Po and Abyssinian specimens, the calyx and leaves have sometimes the margins punctate. The leaves of the Fernando plant are in some specimens like the Abyssinian, in others like the Bourbon. It is a very common tree in the mountains of Abyssinia.

GERANIACEÆ.

1. *Geranium Simense*, *Hochst.*; *Rich. Fl. Abyss.* i. 116.

G. Emirnense, *Hils. & Bojer*, MSS. in *Hb. Hook.*

Hab. In Clarence Peak, alt. 8500 ped. (fl. Ap.-Dec.)

Mr. Mann's specimens are identical with Bojer's Madagascar *G. Emirnense*, and with some of Schimper's Abyssinian *G. Simense*, which A. Richard describes as a very variable plant, and common in the cold regions of Abyssinia.

BALSAMINÆ.

This order is probably common in the hilly regions of Tropical Africa, whence I have seen about a dozen species. Only one, however, is described as Abyssinian, and one South African. I shall here describe four Fernando Po species, of which only one ascends to 5000 feet, and none have been found above that elevation. I have referred these to the sections adopted in the monograph of the East Indian species, published in the fourth volume of this Journal. They are as follows:—

1. UMBELLATÆ. *Folia* alterna. *Flores* ad apicem pedunculi elongati congesti v. dense racemosi.
 2. UNIFLORÆ. *Folia* alterna. *Pedicelli* in axillis foliorum solitarii v. fasciculati, uniflori.
 3. LATERIFLORÆ. *Folia* alterna. *Flores* racemosi, racemi foliis breviores v. axillis foliorum inferiorum dispositi.
1. IMPATIENS (UMBELLATÆ) FILICORNU, *H.f.* *Foliis* longe petiolatis,

late ovatis acutis setoso-crenatis, pedunculis elongatis gracillimis, apice floriferis, bracteis imbricatis cymbiformibus caducis, sepalis lateralibus obtusis, vexillo erecto late oblongo, labello planiusculo, calcare strictiusculo gracillimo alis æquilongo instructo.

Hab. In Clarence Peak, alt. 5000 ped. (fl. Dec.)

Herba tota glaberrima, pedalis; caule gracili simplici. *Folia* alterna, sub 2" long., petiolis æquilonga, membranacea. *Pedunculi* laterales folia superantes, gracillimi, apices tantum floriferi, et ibi bracteis delapsis cicatricati. *Bracteæ*, $\frac{1}{3}$ " long., obtusæ. *Pedicelli* gracillimi, $\frac{3}{4}$ " long., erecti. *Flos* pallide purpureus, 1" diamet. planus. *Alæ* bilobæ, lobo laterali brevi obtuso, terminali oblongo obtuso.

This has very much the habit of the Ceylon *I. subcordata*, Arn.

2. *IMPATIENS (UNIFLORÆ) MANNII*, *H. f.* Caule gracili basi repente, foliis subdistantibus gracile petiolatis, petiolo glanduloso, ovatis acuminatis basi attenuatis setuloso-crenatis, pedicellis 1-2-axillaribus gracilibus ebracteolatis 1-floris, sepalis lateralibus parvis, vexillo mediocri, labello late conico calcare gracili curvo, alis longe gracile petiolulatis, lobo laterali unciformi parvo, terminali lato.

Hab. In Fernando Po, alt. 4000 ped. (fl. Dec.)

Herba 2-3'-pedalis, glaberrima, gracilis. *Folia* 2-3", petiolo, $\frac{1}{2}$ "-1", glandulis gracilibus ornato. *Pedicelli* graciles, petiolis breviores, fructiferi deflexi. *Flores* pulcherrimi, "rubidi" (*Mann*), sicco violacei, labello transverse fasciato. *Alæ* cum ungue gracili fere 1" longæ.

3. *IMPATIENS (UNIFLORÆ) BICOLOR*, *H. f.* Suffruticosa, foliis confertis petiolatis elliptico-lanceolatis obtusis v. acuminatis basi attenuatis grosse setuloso-crenatis, pedicellis unifloris in axillis foliorum solitariis v. confertis ebracteolatis, vexillo parvo erecto, labello amplo late saccato basi in cornu valido ascendente incurvato contracto, alis parvis late oblongis obtusis.

Hab. In Fernando Po, alt. 4000 ped. (fl. Dec.)

Herba 2-3-pedalis, caule basi lignoso robusto, nodoso, superne cicatricato. *Folia* versus apices caulis conferta, patentia, 4-6" long. in petiolum 1" long. angustata, subcarnosula. *Flores* conferti, perplurimi (v. rarius pauci), bicolores, pedicellis 1" long., sæpissime liberis, interdum in pedicellum brevem fasciculatis. *Sepala* lateralibus parva, viridia. *Vexillum* flavo-virens $\frac{4}{3}$ " long., erectum. *Labellum* purpureum. *Alæ* longitudine oris labelli, flavæ purpureo lineatæ.

4. *IMPATIENS (LATERIFLORÆ) HIANIS*, *H. f.* Foliis alternis longe petiolatis ovatis acuminatis basi rotundatis longe setosis setuloso-crenatis, racemis ex axillis inferioribus ortis, bracteis ovato-lanceolatis persistentibus, floribus magnis hiantibus, vexillo amplo erecto orbiculato dorso alato, labello demisso longe crasse conico stricto ore valde obliquo, alis linearibus.

Hab. In Fernando Po, alt. 2000 ped. (fl. Dec.)

Herba gracilis, erecta, glabra, 2½-pedalis, caule simplici basi radicante.

Folia membranacea, glaberrima v. superne sparse pilosa, $2\frac{1}{2}$ "–4" long., basin versus utrinque setis $\frac{1}{2}$ "– $\frac{1}{4}$ " longis filiformibus 1–2 ornata; petiolo 1" long. *Pedunculi* foliis breviores, patentes, 2–6-flori. *Flores* gracile pedicellati, rubri, bilabiati. *Sepala lateralia* viridia, $\frac{1}{4}$ " long. *Vexillum* $\frac{3}{4}$ " lat., dorso late alatum. *Labellum* $1\frac{1}{2}$ " long. *Alæ* ore labelli subæquantes, v. paulo superantes. *Capsula* linearis.

There is another species of *Impatiens* in the Herbarium, but in too imperfect a state for description.

Nat. Ord. OXALIDÆ.

1. *Oxalis corniculata*, L.

Hab. In Clarence Peak, alt. 8500 ped.

Nat. Ord. OCHNACEÆ.

1. *GOMPHIA MICRANTHA*, H.f. Glaberrima, foliis lanceolatis acuminatis serrulatis utrinque nitidis venis remotis arcuatis, racemis terminalibus elongatis paucifloris vix ramosis folio brevioribus, floribus minutis remote fasciculatis glaberrimis.

Hab. In Clarence Peak, alt. 5000 ped. (fl. Nov.)

Frutex 15-pedalis. *Rami* graciles, virgati, teretiusculi. *Folia* breve petiolata, 4–6" long., membranacea, utrinque concolora. *Racemi* gracillimi, pauciflori. *Flores* breviter pedicellati, 1" longi. *Calyx* brunneus, foliolis oblongis. *Petala* rufa.

LEGUMINOSÆ.

The three plants of this family which have been found above 5000 feet, are all essentially temperate forms—one *Cytisus*, typical of the Mediterranean region and Canary Islands, but hitherto unknown in Tropical Africa, and known by one species only in Abyssinia: the others belong to *Trifolium*, also a Mediterranean genus, but several species of which are Abyssinian, including both the Fernando Po ones.

1. *CYTISUS MANNII*, H.f. Sericeo-pilosa, ramulis divaricatis villosis, foliis parvis brevissime petiolatis stipulis subulatis, foliolis elliptico-lanceolatis involutis, floribus ad apices ramulorum confertis sessilibus, calycis labio superiore late bifido.

Hab. In Clarence Peak, alt. 9000 ped. (fl. Dec.)

Frutex 5–6-pedalis, ramis lignosis, ramulisque divaricatis teretiusculis. *Folia* solitaria et fasciculata, $\frac{1}{4}$ " long., stipulis subulato-lanceolatis petiolo adnatis, foliolis acutis $1\frac{1}{2}$ " long. *Flores* flavi, $\frac{1}{3}$ " expans. *Calyx* bilabiatus, sericeus, labio superiore late bifido lobis acuminatis, inferiore apice trifido, lobis subulatis. *Vexillum* orbiculatum dorso sericeum. *Alæ* carinam obtusam genitalia includentem æquantes. *Staminum* tubus integer. *Ovarium* hirsutulatum; stylo gracili mediocri; stigmatibus fere terminalibus; ovulis paucis.

2. *Trifolium subrotundum*, Steud. & Hochst.; A. Rich. Flor. Abyss. i. 172. *Var.* stipulis majoribus.

Hab. In Clarence Peak, alt. 9000 ped. (fl. Dec.)

Herba diffusa, 1-2-pedalis, corolla rubra.

A common Abyssinian plant, cultivated as horse-forage according to Dr. Roth (Herb. Hook.). The Fernando Po specimens differ in having larger stipules ($\frac{3}{4}$ " long.) than the Abyssinian, in which, however, they are very large for the genus (nearly $\frac{1}{2}$ "): in habit, foliage, inflorescence and flowers they are identical.

3. *Trifolium Simense*, *Fresen*; *A. Rich.*, l. c. 171.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Herba 1 $\frac{1}{2}$ ' alt., corolla violacea.

Very similar, as A. Richard indicates, to *T. subrotundum*, but well distinguished by the calyx, very narrow leaflets, and short petioles. The stipules terminate in a long filiform appendage, both in the Fernando Po and Abyssinian specimens.

ROSACEÆ.

1. *Rubus apetalus*, *Poir.* *Var.* *glabrior* petalis parvis instructa.

Hab. In Clarence Peak, alt. 7000 ped. (fl. Nov.)

Scandens 12-15-pedalis. *Petala* alba, valde caduca.

This is clearly a form of *R. apetalus* of Bourbon, of which I have examined a Bourbon specimen gathered by Carmichael. Another form of it, sometimes bearing petals, and otherwise differing in having glabrous carpels, is found in Madagascar. A third, always petaliferous, is the *R. exsuccus*, Steud., of Abyssinia, which is described by A. Richard (Fl. Abyss. i. 256) as having the fruit entirely dry, but of which Dr. Roth remarks, "Berries eatable" (MS. in Hb. Hook.). Dr. Kirke, who has gathered the latter species in the Shirà Mountains (Livingstone's Exped., 1860), says, "Fruit good, exactly like the bramble, but small." The Fernando Po specimens are not in fruit. This species has not been found in South Africa.

UMBELLIFERÆ.

1. *Sanicula Europæa*, *L.*

Hab. In Fernando Po, alt. 4000 ped. (fl. Nov.)

I should suspect some error in the low elevation assigned by Mr. Mann to this plant, were his specimens not so carefully ticketed in other cases that I have every reason to put confidence in this. A. Richard gives *S. Europæa*, var. *Capensis*, as a native of Abyssinia; he does not, however, say what the characters of that variety are, and adds that his specimens are identical with Parisian. This plant has a very wide range in the mountainous regions of both Americas and Asia, and is also found in South Africa.

2. *AGROCHARIS GRACILIS*, *H. f.* *Caule* elongato ramoso foliisque hispidulo-pilosis, foliis gracile petiolatis bipinnatisectis segmentis lanceolatis acutis incis, pedunculis elongatis sub apices patentim hispidis pilis flexuosis, floribus dense congestis.

Hab. In Clarence Peak, alt. 7000 ped. (fl. Dec.)

Herba gracilis, 4-pedalis, *A. melananthæ* (Abyssiniæ) quam maxime affinis, differt caule gracili elongato ramoso, foliis magis pilosis, capi-

tulis minoribus densius congestis, pedunculisque apices versus patentius pilosis pilis laxioribus flexuosis.

It is with some hesitation that I venture to describe this plant as different from the Abyssinian, fearing the characters depend wholly on locality. This curious genus is allied to *Daucus*, and the Abyssinian is the only previously described species.

3. *Gymnosciadium*??

Hab. In cacumine Clarence Peak, alt. 10,000 ped.

Herba pilosa, radice valida insapida, caulibus 4-6'' longis; foliis pinnatis, pinnis paucijugis crenatis rhombéo-rotundatis reniformi-rotundatisve terminali cordato. *Umbellæ* compositæ. *Involucrum* generale nullum, partiale foliolis paucis. *Calycis* margo integer. *Petala* inflexa. *Styli* breviusculi.

This may belong to the Abyssinian genus to which I have doubtfully referred it; but not being in fruit, nothing can be made of it.

4. Genus?

Hab. In Clarence Peak, alt. 9500 ped. (fl. Dec.)

Herba glabra, elata, 2-3-pedalis; radice insapida; caule tereti striato; foliis radicalibus tripinnatis, foliolis ovato-lanceolatis, lobatis, pinnatifidisve, segmentis acutis. *Umbella* composita. *Involucrum* universale et partiale foliolis paucis linearibus. *Calycis* limbus 5-lobus, lobis acutis. *Petala* inflexa. *Styli* mediocres recurvi. *Mericarpia* immatura anguste oblonga, late alata, dorso 5-juga.

This is a very ordinary form of *Umbellifera*, presenting no striking character.

ARALIACEÆ.

PARATROPIA MANNII, *H. f.* Glaberrima, foliis 4-9 foliolatis, petiolis petiolulisque gracilibus, foliolis ovato- v. oblongo-lanceolatis longe acuminatis integerrimis superne lucidis venis inconspicuis, marginibus subundulatis, floribus in capitulos arcte connatis, capitulis secus ramos simplices elongatos racemosis longe pedunculatis.

Hab. In Ins. Fernando Po, alt. 5000 ped, (fl. Dec.)

Arbor 40-pedalis, caule crasso. *Folia* stipulata, stipulis 1'' dorso supra medium petiolo adnatis ovato-lanceolatis subspathaceis; petiolo 6-8'', tereti; petiolulis 1½'' apice subarticulatis; foliolis 4-7'' coriaceis, inferne opacis. *Inflorescentia* ut videtur terminalis, ramis floriferis in ramulo apice crasso confertis, 1' et ultra, strictis, erectis, v. erecto-patentibus, basi bracteatis; bracteis stipulis similibus. *Capitula* diam. pisi, globosi, sub-20-flori, secus pedunculos floriferos racemosi, pedunculis crassis 1'' long. post anthesim sæpe decurvis. *Flores* sub ⅙'' expans., flavi, hermaphroditi? bracteolis late ovatis pubescentibus ovario brevioribus suffulti. *Ovarium* late obconicum, 5-loculare, obscure angulatum. *Calycis* limbus truncatus, integer, brevis, liber. *Petala* ovata apice inflexa. *Filamenta* subulata petala æquantia; antheris breviter oblongis flavis. *Stigmata* punctiformia, disco late conico vix elevato.

A very handsome plant, of which Mr. Mann has collected excellent specimens.

RUBIACEÆ.

1. *Galium Aparine*, L. *Var. hamatum*.

G. hamatum, Hochst.; *A. Rich. Flor. Abyss.* i. 345.

Hab. In Clarence Peak, alt. 6-8000 ped. (fl. Dec.) Flores flavi.

I find it impossible to distinguish this from *G. Aparine*, L. A. Richard remarks of the Abyssinian specimens of *hamatum*, that the hooks of the leaves are stronger and more marked than in any other of the genus; but I do not find them to be so in his or this plant, though more strong than in many European specimens of *G. Aparine*. Mr. Mann describes the flowers as yellow, A. Richard as *apparently* purple. It is also a native of South Africa and many other parts of the world.

2. *Galium rotundifolium*, L. *Var. foliis acutioribus*.

Hab. In cacumine Clarence Peak, alt. 10,000 ped. (fl. Dec.)

All the leaves of the Fernando Po specimens are acute, or rather mucronate; some of those of the Abyssinian specimens are so too, whereas in the European and Indian forms they are more or less obtuse: still all the other characters appearing identical with those of the European, I cannot separate this on the grounds of one which is variable. Mann describes the flowers as yellow; in the dried specimens they appear white.

3. ANTHOSPERMUM ASPERULOIDES, *H.f.* Parvulum, caule flexuoso teretiusculo hirtello, foliis parvis fasciculatis lanceolatis subsessilibus, stipulis utrinque rigide subulatis marginibus recurvis parce hispidulis, floribus parvis tetrameris, coccis oblongis lævibus glaberrimis.

Hab. In cacumine Clarence Peak, alt. 10,000 ped. (fl. Dec.)

Herba parvula, 8'' alt., parce ramosa, foliosa. *Caules* teretiusculi. *Folia* densa, patula, $\frac{1}{4}$ '' long.

Allied both to Cape and Abyssinian species, but distinct from any known to me by the small size, flexuose habit, and erect subulate limb to the sheathing stipules.

COMPOSITÆ.

1. VERNONIA CLARENCEANA, *H.f.* Erecta, herbacea, gracilis, subhispido-pilosa; caule parce diviso subflexuoso, foliis linearibus lineari-lanceolatisve sessilibus semi-amplexicaulibus remote serrato-dentatis acuminatis, capitulis multifloris ad apicem caulis congestis breve pedunculatis, pedunculis tomentosus, involucri late campanulati squamis rigidiusculis lineari-lanceolatis acuminatis purpureis, dorso pilosis subherbaceis.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Herba rigidiuscula, 1-2-pedalis. *Caulis* purpureus, laxè foliatus, superne subvillosus. *Folia* 2-3'' long., suberecta, paulo recurva, $\frac{1}{3}$ ''- $\frac{3}{4}$ '' lat., inferiora in petiolum subangustata, superiora basi latiora, rigide membranacea, utrinque subhispido-pilosula, nervis paucis prominulis. *Capitula* 10-15 ad apices ramulorum, $\frac{1}{3}$ '' long. et lat. non bracteata.

Involucris squamæ sub 2-seriales, enerves, margine scariosæ. *Receptaculum* planum, foveolatum, nudum. *Flores* numerosissimi, perplurimi foeminei; tubus corollæ gracilis, pappo et stylo gracili dimidio brevior. *Pappus* albus, nitidus, 1-serialis, pilis filiformibus flexuosis scaberulis. *Achæmium* parvum, pallidum, glaberrimum, valde compressum, oblique obovoideum, margine subincrassato. Fl. masc. pauci, 5-dentati.

This belongs to the section with *V. attenuata*, DC., and is most nearly allied to an Abyssinian one called *V. inulæfolia*, Steud.

2. *Adenostemma viscosum*, Forst.

Hab. In Fernando Po, alt. 4–8000 ped. (fl. Dec.)

Herba 3–4-pedalis, corollis albis.

I believe that there is but one species of this genus in the Old World; it is a native of Abyssinia (*A. Schimperii*, C. H. Schultz), of South Africa, of all Tropical Asia and the Pacific Islands. The Fernando Po form is the common Indian one.

3. *DICHROCEPHALA OBLONGA*, H.f. Hispidulo-pilosa, caule tereti apice ramoso, foliis sessilibus patulis lineari- v. oblongo-lanceolatis acuminatis irregulariter pinnatifido-lobatis marginibus recurvis lobis subremotis incisus lobulis acutis v. mucronatis, capitulis late oblongis purpureis, involucri squamis 6–8 herbaceis pubescentibus, receptaculo columnari.

Hab. In cacumine Clarence Peak, alt. 10,700 ped. (fl. Dec.)

Herba erecta, rigidula, 1–2-pedalis. *Folia* $1\frac{1}{2}$ "–2" long.; $\frac{1}{3}$ "– $\frac{1}{2}$ " lat.

Capitula $\frac{1}{4}$ " long.—*D. chrysanthemifoliæ*, DC. (Abyssinica, C. H. Schultz) proxima, differt habitu rigido, caule simplici, foliis angustioribus rigidis acutius lobatis, et præcipue capitulis oblongis, involucro oligophyllo et receptaculo columnari.

The nearest ally of this is *D. chrysanthemifolia*, a native of Abyssinia and India.

4. *HELICHRYSUM*(*XEROCHLÆNA*)*MANNII*, H.f. Caule robusto villosa apice ramoso; foliis densissimis sessilibus, patulis demum reflexis, semi-amplexicaulibus oblongo-lanceolatis acutis integerrimis enerviis subtus marginibusque tomento appresso niveis, pedunculis basi capitulisque magnis albis v. pallide stramineis foliaceo-bracteatis, involucri squamis numerosissimis hyalinis splendentibus acuminatis.

Hab. In cacumine Clarence Peak, alt. 10,000 ped. (fl. Dec.)

Herba robusta, dense foliosa, pedalis et ultra, tomentosa. *Caulis* strictus erectus, teres, simplex, densissime foliatus. *Folia* 2"–3" long., $\frac{2}{3}$ "-lata, acuta et apiculata, inferiora supra glabrata, inferne dense appresse lanata, superiora utrinque laxius lanata v. araneosa. *Capitula* subpaniculatim corymbosa, bracteis foliaceis fere tecta, expansa $1\frac{1}{4}$ " lata, pedunculis araneosis bracteolatis. *Involucris* squamæ perplurimæ, multiseriatæ, suberectæ, flosculis $\frac{1}{5}$ " excedentes, apicibus acuminatis vix recurvis, externæ araneosæ, ceteræ glaberrimæ, internæ minores et

angustiores late unguiculatæ, supra unguem purpureæ. *Receptaculum* convexiusculum, amplum, alveolatum. *Flosculi* numerosissimi. *Pappus* paucisetosus. *Corolla* anguste tubulosa. *Achæmium* minimum glabriusculum.

A noble species, allied to *H. fœtidum*, but differing in the dense foliage, leaves less broad at the base, different form of inflorescence, which is more paniculate than corymbose, and much larger capitula.

5. *Helichrysum* (*Xerochlæna*) *fœtidum*, *Cass.*; *A. Rich. Flor. Abyss. i.* 426.

Hab. Ad Clarence Peak, alt. 10,000 ped. (fl. April.)

An extremely variable plant, native of Abyssinia, South Africa, Madagascar, and Mauritius, varying in breadth and tomentum of foliage, somewhat in size of the capitula, and much in their colour, from white to deep golden yellow.

6. *Helichrysum* (*Chionostemma*?) *chrysocoma*, *C. S. Schultz*; *A. Rich. Flor. Abyss. i.* 424. *Var. angustifolium*, gracile, foliis anguste lanceolatis acuminatis marginibus revolutis tomentosis v. superne glabratis; pappi setis albis.

Hab. Clarence Peak, alt. 10,000 ped. (fl. April.) *Herba* 4-pedalis.

I have examined several authentically named Abyssinian specimens of this plant, which present great variations in tomentum and breadth of foliage. The present differs from all in being rather more glabrous and slender, and smaller in foliage. The inflorescence, capitula, involucre, and florets are identical in all. The receptacle in all is covered with conical subulate elongate dark-yellow rigid bodies, that are persistent after the florets have fallen away. They are not noticed in A. Richard's work; these would refer this species to DeCandolle's section *Chionostemma*, were it not that the setæ of the pappus are quite free at the base. Richard describes the pappus as ferruginous, but it is white in all the Abyssinian specimens I have examined of Schimper's, and in the Fernando Po ones also.

7. *Helichrysum* (*Achyrocline*) *Hochstetteri*, *C. H. Schultz*; *A. Rich. Flor. Abyss. i.* 429.

Hab. Clarence Peak, alt. 8500 ped. (fl. Jan.) *Herba* 2-3-pedalis.

Mr. Mann's specimens are not a full flower, but the small size, great number and form of the capitula, the involucreal scales, habit, tomentum, foliage and winged stems, leave no room to doubt that the present is identical with the Abyssinian plant, of which I have compared many specimens. The bruised capitula of the Abyssinian plant are aromatic, a character I do not observe in the Fernando Po, which are probably either too young, or, owing to the damp climate, deficient in aroma.

8. *Helichrysum* (*Chionostemma*?) *globosum*, *C. H. Schultz*; *A. Rich. Flor. Abyss. i.* 425.

Hab. Clarence Peak, alt. 10,000 ped.

Apparently identical with the Abyssinian plant.

9. *Gynura vitellina*, *Benth. in Niger Flora*, 438.

Hab. Fernando Po, ad 8500 ped. in Clarence Peak attingens. (fl. Dec.)

First found in Fernando Po by Vogel, afterwards by Barter on the same island, and in Abyssinia by Dr. Roth. It is an instance of a mountain plant descending to the level of the sea at the base of the mountains, but not found elsewhere at the same level, on the African coast.

10. *SENECIO* (OBÆJACÆ) *CLARENCEANA*, *H.f.* Herbacea, erecta, glaberrima, caule folioso, foliis amplis patulis sessilibus lineari-oblongis, v. oblongo-lanceolatis obtusis basi auriculatis marginibus semipinnatifidis, lobis grosse dentatis, capitulis ($\frac{1}{2}$ " long.) corymbosis obconico-campanulatis gracile pedicellatis multifloris, involucri vix calyculati foliolis linearibus pedicellisque puberulis, flosculis omnibus tubulosis (sub 30-40), achæniis glabris.

Hab. Clarence Peak, alt. 9000 ped. (fl. Dec.)

Herba 2-pedalis, robusta, glabra nisi pedunculis pedicellis involucriisque puberulis. *Caulis* erectus, simplex. *Folia* 3"-5" long., 1" lat., sub-carnosula, subtus pallidiora. *Corymbi* multiflori.

11. *SENECIO* (ARBORESCENTES) *MANNII*, *H.f.* Glaberrima, ramis apice foliatis teretibus cicatricatis, foliis breve petiolatis lanceolatis longe acuminatis dentatis costa nervisque subtus creberrimis pilosulis, paniculis terminalibus ramosis multifloris, ramis pedunculis pedicellis-que gracilibus pubescentibus capitulis ($\frac{1}{3}$ " long.) angustis paucifloris, involucri squamis paucis erectis apice incurvis anguste linearibus basi bracteolatis.

Hab. Fernando Po, alt. 6000 ped. (fl. April.)

Arbor parva, 25' alt., ramis crassiusculis. *Folia* spithamæa et ultra 1 $\frac{1}{2}$ " lat., petiolo vix 1" long., membranacea, utrinque concolora, juniora parce ferrugineo-tomentella, nervis crebris subhorizontalibus. *Panicula* longiuscule pedunculata, 6" alt., ramis subelongatis. *Involucri* squamæ (sub 5) angustæ, medio herbacæ, acute carinatae, marginibus late hyalinis, apicibus incrassatis. *Flosculi* sub 6, achæniis glabris.

A handsome species, resembling some of the Indian mountain forms.

LOBELIACEÆ & CAMPANULACEÆ.

1. *LOBELIA* (TUPA) *COLUMNARIS*, *H.f.* Tota pubescenti-tomentosa foliis confertis sessilibus anguste lanccolato-oblongis acutis irregulariter denticulatis subtus dense tomentosis, racemo elongato conico densifloro, floribus dense pubescentibus.

Hab. Clarence Peak. (fl. Dec.)

Herba robusta, ut videtur 3-4-pedalis, dense foliosa. *Caulis* crassus, simplex, diam. digiti majoris. *Folia* 4"-6" long., $\frac{3}{4}$ "-1" lat., erecto-patentia, nervis crebre reticulata. *Racemus* 8"-12" long. *Flores* densissime imbricati, 1 $\frac{1}{3}$ " long., angusti; alabastris cylindræis, lente curvis. *Bractææ* inferiores foliæ, flores subæquantes, superiores

breviores. *Pedicelli* inferiores 1" long. *Calycis* tubus hemisphæricus, lobis anguste lanceolato-subulatis, integerrimis, corollam triente brevioribus. *Corolla* lobis anguste ligulatis tubum æquantibus. *Staminum* tubus fere rectus, pubescens; antheris pilosis vix barbatis.

Closely allied to *Lobelia nicotianæfolia* of India. There are two Abyssinian allies, but no described South African, Mauritian or Madagascar.

2. WAHLENBERGIA POLYCLADA, *H. f.* Hispido-pilosa, superne glabra, caulibus e collo numerosissimis basi decumbentibus demum erectis apice dichotome ramosis floriferis, foliis (parvis) sessilibus oblongo-v. ovato-lanceolatis acutis integerrimis undulatis, floribus parvis, calyce longe obconico, corolla brevissima capsula biloculari.

Hab. Clarence Peak, ad declivum orientem alt. 9000 ped. (fl. Dec.)

Herba radice gracili. *Caules* spithamæi ad pedalem, inferne et folia pilis hispidulis subcrispatis laxiuscule vestiti, superne divisi, glaberrimi gracillimi. *Folia* $\frac{1}{4}$ "– $\frac{1}{2}$ " long., basi obtusa v. subcordata, margine lente recurva. *Flores* $\frac{1}{3}$ " long.; *calycis* tubus anguste obconicus, lobis breviusculis, triangulari-lanceolatis. *Corolla* parva, cærulea, *calycis* lobos vix superans, an perfecta?

Not unlike *W. gracilis*, a very widely diffused Australian, Indian, &c. species, and of the same habit.

3. WAHLENBERGIA ARGUTA, *H. f.* Glabra, caulibus gracillimis elongatis ascendentibus, apice pedunculos elongatos dichotome ramosos gerentibus, foliis sessilibus lanceolatis acuminatis argute serratis, floribus mediocribus, calyce brevissime obconico, corolla campanulata, capsula semisupera 3-loculari.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Herba gracillima, caulibus flexuosis pedalibus parce vage ramosis. *Folia* $\frac{1}{2}$ "– $\frac{3}{4}$ " long., basi angustata, marginibus tenuiter recurvis. *Pedunculi* 3–4-pollicares, superne dichotome divisi, ad axillas bracteati, bracteis subulatis. *Flores* $\frac{1}{3}$ "– $\frac{1}{2}$ " longi, suberecti. *Calycis* tubus brevissimus, lobis triangulari-lanceolatis, corolla pallide cærulea multoties brevioribus. *Capsula* trapezoidea semisupera.

The habit of this species is that of the St. Helena *W. angustifolia*, ADC, to which it is nearly allied, though the capsula is 3-celled.

ERICÆ.

1. LEUCOTHOE ANGUSTIFOLIA, var. β . pyrifolia, DC. *Prodr.* i. 603.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Arbor 15–20-pedalis, corolla rufo-ferruginea.

Apparently identical with the plant of Mauritius and Bourbon; it also inhabits Madagascar. The flower and fruit vary a good deal in size.

2. Blæria spicata, *Hochst.*; *A. Rich. Flor. Abyss.* ii. 13.

Hab. In cacumine Clarence Peak, alt. 10,700 ped. (fl. Dec.)

Fruticulus pedalis.

This is identical with the Abyssinian plant. The genus was previously supposed to be confined to South Africa and Abyssinia.

3. *ERICINELLA MANNII*, *H. f.* Ramulis puberulis, foliis appressis glabris nitidis, pedicellis folia superantibus, sepalis superioribus corolla dimidio brevioribus, antheris muticis inclusis, stylo breviter exserto.

Hab. Clarence Peak, alt. 10,000 ped. (fl. Dec.)

Frutex 10-pedalis.

Extremely closely allied to the South African *E. multiflora*, Kl., and Madagascar *E. gracilis*, Benth., and almost intermediate between these, though quite distinct from both. It differs from *gracilis* in the pubescence, white stems and branches, longer pedicels and shorter sepals; from *E. multiflora* in the longer pedicels, erect leaves, muticous anthers and short style.

LOGANIACEÆ.

1. *ANTHOCLEISTA SCANDENS*, *H. f.* Caule tetragono, foliis petiolatis obovatis apiculatis, petiolis non alatis basi exauriculatis, corolla 12-mera, antheris fauce corollæ sessilibus.

Hab. Clarence Peak, alt. 5000 ped. (fl. Dec.)

Arbor scandens, 50-pedalis. *Ramuli* non spinosi. *Folia* 3''-4'' long., petiolo pollicari. *Calyx* fere 1'' long. *Corolla* 2'' expans. *Bacca* obovoidea, 2-pollicaris.

A very distinct species from *A. Vogelii* or *nobilis*, with flowers twice as large, leaves not half as large, sessile anthers, and a much larger berry.

GENTIANEÆ.

1. *Sebæa brachyphylla*, *Griseb.*; *DC. Prodr.* ix. 53.

Hab. Clarence Peak, 8500—10,000 ped. (fl. Dec.)

Herba 1-1½-pedalis, floribus flavis.

Appears identical with the Madagascar plant.

2. *SWERTIA CLARENCEANA*, *H. f.* Glaberrima, caule erecto anguste alato, foliis cordato-subrotundis obtusis margine recurvis, sepalis oblongis obtusis corolla dimidio brevioribus, corollæ lobis obovato-oblongis obtusis, staminibus 5, foveæ nectariferæ marginibus fimbriatis.

Hab. Ad cacumen ipsum Clarence Peak, alt. 10,700 ped. Exempl. solitarium. (fl. Dec.)

Herba 6'' alt. subrobusta, caulis alæ angustæ, interdum margine subglanduloso-denticulata. *Folia* ⅓'' long. *Flores* laxè cymosi, pro planta majusculi, fere ¾'' expans.

Very nearly allied to *S. Abyssinica*, but differs in more stout habit and much larger flowers.

MYRSINEÆ.

1. *Mæsa Indica*, *ADC.*; *Prodr.* viii. 80.

Hab. Fernando Po, alt. 5000 ped. (fl. Nov.)

Arbor parva, 15-20-pedalis.

This does not differ from the Indian plant, which is found from the Himalaya to Australia. It is also very similar to a Natal and East African

species, with ciliated panicles. The *M. lanceolata* of Abyssinia differs more in texture and size than any floral characters.

LABIATÆ.

1. PLECTRANTHUS (COLEOIDES) GLANDULOSUS, *H. f.* Herbaceus superne glanduloso-pilosus, foliis petiolatis ovato-cordatis acutis grosse crenatis crenis crenulatis membranaceis, racemis laxe paniculatis, paniculæ ramis patentibus paucifloris, pedicellis gracilibus, corollæ defractæ labio inferiore porrecto saccato.

Hab. In Clarence Peak, alt. 7000 ped. (fl. April.)

Herba diffuse ramosa, 8-pedalis. *Rami* graciles, obtuse tetragoni, superne cum petiolis et inflorescentia glandulosi. *Folia* patentia longe petiolata, 3''-5'' long., 2''-4'' lat., supra glabra, subtus ad nervos pilosula, petiolis 2''-3'' long. *Panicula* ampla, laxa, divaricatim ramosa. *Verticillastra* pauciflora, floribus gracile pedicellatis in pedunculo communi gracili ternis. *Calyx* breviseulus, labio superiore brevi 1-lobo recurvo, inferiore longiore 4-fido lobis subulatis. *Corolla* cærulea, fere $\frac{2}{3}$ '' long., labio superiore reflexo, inferiore cymbiformi obtuso.

This has near allies both in South Africa, Abyssinia, Madagascar, and India: it differs from the technical character of the *Coleoideæ* in the pedicelled flowers.

2. PLECTRANTHUS (INDI) RAMOSISSIMUS, *H. f.* Pubescente-pilosa v. tomentosa, eaule herbaceo erecto, ramis divaricatis, foliis petiolatis ovato-lanceolatis acutis crenatis utrinque pubescenti-pilosis, floralibus similibus sessilibus, cymis evolutis secus ramulos floriferos seriatim dispositis, pedunculis gracilibus apice ramosis 10-12-floris, calycibus villosis canis parvis, corollæ tubo pubescente recto.

Hab. In Fernando Po, alt. 5000 ped. (fl. Dec.)

Herba 6-pedalis, gracilis, divaricatim ramosissima, caulibus ramisque pilis subferrugineis sæpe deflexis vestitis. *Folia* $1\frac{1}{2}$ ''-2'' longa. *Rami* floriferi 6''-10'' long. *Cymæ* pedunculi patentés, graciles, $\frac{1}{2}$ ''- $\frac{3}{4}$ '' long., apice bracteas 2 patentés subulatas gerentes. *Flores* parvi, $\frac{1}{4}$ '' long. *Calycis* tubus canus, basi hemisphæricus, ore obliquo contracto. *Corolla* calyce ter longior, alba, recta v. lente curva, lobis subæqualibus recurvis, genitalibus longe exsertis.

All the other African plants of this section (Cape, Madagascar and Abyssinia) belong to a group in which the cymes are crowded and nearly sessile, with the corolla tube defracted. The present is much more closely allied to several mountain Indian species.

3. Pycnostachys Abyssinica, *Fresen. Flora*, 1838, ii. 608.

Hab. Fernando Po, alt. 700 ped. (fl. Dec.)

Herba 8-pedalis, corolla violacea.

Judging from the short description of Fresenius in the 'Flora,' this is

certainly his plant. It differs from its very near ally *P. cærulea* of Abyssinia in the large flowers and calyx and dense pubescence; from the Cape *P. reticulata* in the petiolate and broader leaves.

4. *Calamintha Simensis*, *Benth. in DC. Prodr.* xii. 230.

Hab. Clarence Peak. alt. 8500 ped. (fl. Dec.)

Herba 2-pedalis, corolla purpurea.

This in no way differs from Abyssinian specimens, and is very nearly allied to the European *C. Acinus*, Benth.

5. *STACHYS (STACHYOTYPUS) ACULEOLATA*, *H. f.* *Caule* tenui procumbente elongato petiolisque retrorsum aculeolatis, foliis petiolatis ovato-cordatis obtusis grosse crenatis, verticillastris sessilibus sub 3-floris, floribus breve pedicellatis, calyce obconico subæqualiter 5-dentato lobis spinulosis, corolla tubo exserto, labio inferiore porrecto amplo trilobo lobo medio bilobo.

Hab. Clarence Peak, alt. 9000 ped. (fl. Dec.)

Herba parce ramosa, 1'-2' longa. *Folia* distantia, 1"-1½" longa, fere æquilata, petiolo pollicari. *Verticillastra* pauca, distantia, axillaria. *Flores* ½" long., pallido purpurei tubo longe supra basin intus barbato, extus piloso. *Antheræ* divaricatæ.

This is the same with an undescribed Abyssinian species collected by Dr. Roth; but the stem is more slender, the petioles longer, the calyx rather smaller; I have no corolla in the Abyssinian specimen.

SOLANÆÆ.

1. *Solanum Indicum*, *L.* *Var. micranthum.*

Hab. Fernando Po, alt. 6000 ped.

Frutex 6-8-pedalis, floribus albis.

Common throughout Tropical Africa, and probably not different from *S. Adoense* of Abyssinia.

ACANTHACEÆ.

1. *Dicliptera maculata*, *Nees. ? A. Rich. Fl. Abyss.* ii. 158.

Var. Glanduloso-pilosa, floribus majoribus.

Hab. Fernando Po, alt. 5000 ped. (fl. Dec.)

Scandens 20-pedalis, corolla alba.

Apparently quite the same as the Abyssinian plant, but the flowers are either larger or owe their appearance of being so to better drying. In the Fernando specimens all parts are pilose and glandulose, in Abyssinian ones glabrous, but in A. Richard's character they are stated to be covered with cottony hairs. In the Fernando Po and one Abyssinian specimen the involucreal leaves are quite obtuse and mucicous, in another Abyssinian they are obscurely mucronate, and in a third ovate and pungent. Perhaps more than one species is included under this name.

SCROPHULARINEÆ.

1. *Limosella aquatica*, L. Var. *tenuifolia*.

Hab. Clarence Peak, alt. 9000–10,000 ped. locis humidis. (fl. Dec.)

This is an American, Australian, and South African form; the Abyssinian is the common European one, which also grows in South Africa.

2. *VERONICA* (*VERONICASTRUM*) *MANNII*, H.f. Caule e basi decumbente erecto simpliciusculo bifariam pubescente foliato, foliis sessilibus oblongo-lanceolatis remotiuscule serrulatis acutis, racemo terminali conferto glanduloso-tomentoso, staminibus corollæ brevioribus, capsula orbiculata emarginata.

Hab. Ad cacumen Clarence Peak, alt. 10,700 ped. (fl. Dec.)

Herba gracilis, pedalis. *Caule* tereti basi radicante. *Folia* $\frac{2}{3}$ " long., subcoriacea. *Racemus* brevis v. elongatus. *Flores* breve pedicellati, cærulei $\frac{1}{3}$ " expans. *Calycis* lobi oblongi, obtusi, capsulam æquantés.

Very nearly allied to *V. glandulosa*, Hochst., of Abyssinia, but, as far as the several excellent specimens of both show, quite distinct in the narrow leaves and sepals, and bracts shorter than the flowers. It may well, however, prove to be a variety of that plant.

PLANTAGINEÆ.

1. *PLANTAGO* (*LEPTOSTACHYS*) *PALMATA*, H.f. Rhizomate perenni horizontali, foliis longe petiolatis late cordato-orbiculatis palmatis 5–7 lobis, spica gracili, capsulis dispermis.

Hab. Clarence Peak, alt. 8000 ped. (fl. Dec.)

Glabra v. parce pilosa. *Rhizoma* crassum, fibras rigidas demittens, collo brevi. *Petioles* 4"–6" longi, glabriusculi, apice dilatati. *Folia* 2"–3" long. et lat., membranacea, nervis radiantibus. *Scapi* petiolis subbreviores. *Flores* inter minores, laxè imbricati, basi laxè barbati. *Bracteolæ* et sepala consimilia obtusæ oblongæ dorso medio herbacæ late scarioso-marginatæ, glabræ v. parce pilosæ. *Corolla* parva, genitalibus longe exsertis. *Capsula* calycem paulo superans. *Semina* viridia, crassiuscula, cymbiformia.

A very remarkable species in the form of the leaf.

SANTALACEÆ.

1. *THESIUM* (*EUTHESIUM*) *TENUISSIMUM*, H.f. Ramis e collo plurimis ramulosis ramulisque gracillimis glaberrimis sulcatis, racemo ramoso, bracteolis 2 bracteam superantibus perianthio dimidio brevioribus ovato-subulatis, perianthii subcampanulati 4-5-fidi lobis inflexis exauriculatis, stylo stamina attingente, stigmatè capitellato.

Hab. Ad Clarence Peak, alt. 9000 ped. (fl. Dec.)

Radix elongatus, teres, crass. pennæ corvinæ. *Rami* 4"–6", gracillimi, angulati, squamulis minutis raris subulatis aucti. *Racemi* rami pauci breviusculi fasciculis sub 3-floris. *Bracteæ* et *bracteolæ* carinatæ ob-

scure ciliatæ. *Perianthium* $\frac{1}{8}$ " long. obscure et obtuse angulatum, lobis breviusculis glaberrimis v. margine obscure ciliatis. *Filamenta* ori inserta, antheris duplo longiora.

Very nearly allied indeed to *T. Madagascarense*, A. DC., which is the only other species of this vast genus in which the bracteolæ exceed the bracts, and the stems are almost leafless. It differs remarkably from that plant in size, in the very numerous very slender stems and branches, and much smaller flowers.

THYMELEÆ.

1. *PEDDIEA PARVIFLORA*, *H. f.* Stamina ori perianthii inserta, ovarium apice villosum.

Hab. Fernando Po, alt. 5000 ped. (fl. Nov.)

Arbor 15-20-pedalis, floribus viridibus.—*P. Africanæ*, Harv., simillima, differt ramis gracilibus foliis magis membranaceis, floribus duplo minoribus, staminibus ori perianthii insertis, ovarioque apice toto villoso. The only congener of this is a subtropical Port Natal tree.

URTICEÆ.

1. *Parietaria Mauritanica*, *Wedd.*

Hab. Clarence Peak, alt. 8000 ped. (fl. Dec.)

Herba 6-8 pedalis.

The bracts are decidedly ovate, though narrower than usual in this form which seems to pass into *P. debilis*, Forst.; it is described by Weddell as a Mediterranean and North African species.

EUPHORBIACEÆ.

1. *EUPHORBIA (ESULA) AMPLA*, *H. f.* Herbacea, glaberrima, foliosa; caule simplici superne patentim ramoso, foliis membranaceis petiolatis lanceolatis acutis subtus glaucescentibus, floralibus late ovato-cordatis v. triangulari-ovatis acuminatis, involucris solitariis laminis fimbriatis, glandulis semilinearibus cornubus brevibus.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Herba 4-pedalis, caule crassiusculo, terete, inferne nudo. *Rami* patentés, conferti, spithamei et ultra, foliosi, terminalibus divaricatis. *Folia* 4'-5" long., $\frac{3}{4}$ "-1" lat., integerrima, tenuiter nervosa, nervis divaricatis. *Involucra* sparsa, minima, solitaria. *Stamina* sub 8.

The habit of this species resembles *E. Lathyris*, but the whole plant is of a totally different texture; it is most near *E. monticola*, Hochst., of Abyssinia, but has not the involucral glands produced into subulate horns as in that plant. It is also allied to the Indian *E. Rothiana*; but in that the inflorescence is borne on peduncled special branches, and the involucre are numerous.

2. *CLAOXYLON (ATHROANDRA) MANNII*, *H. f.* Glaberrimum, gemmis

perulatis, foliis alternis petiolatis lanceolatis acuminatis irregulariter sinuoso-serratis basi biglandulosis, fl. masc. laxe paniculatis, gracile pedicellatis, perianthio late campanulato 4-5 fido lobis triangularibus valvatis, antheris numerosissimis in globum supra receptaculum aggregatis, fl. fœm. perianthio 2-lobo, glandulis 2-lobis alternantibus, ovario 2-loculari, stigmatibus elongatis.

Hab. Fernando Po, alt. 5000 ped. (fl. Dec.)

Frutex 15-pedalis, ramis fragilibus teretibus. *Gemmæ* in axillis foliorum brevibus squamulis late obovatis rigide coriaceis pallidis nitidis tectæ. *Folia* spithamæa, membranacea, basi 3-nervia, petiolo pollicari. *Racemi* axillares et cum ramulis e gemmis orti, petiolis breviores v. æquilongi, pedunculo gracillimo, floribus paucis subcorymbosis gracile pedicellatis, pedicellis $\frac{1}{4}$ "- $\frac{1}{3}$ " long. *Alabastra* late ovoidea. *Flores* virides, $\frac{1}{4}$ " diam. *Antheræ* numerosissimæ, sessiles, squamulis non immixtæ, loculis globosis. *Fl. fœm.* parvi, perianthii lobis parvis minutis oblongis. *Styli* recurvi, elongati.

A very singular plant, probably generically distinct from *Claoxylon*, from all other species of which the perulate buds abundantly distinguish it. A very similar species was found in the Niger by Barter.* The structure of the flower agrees with the character of *C. cordifolium*, Benth., but in that the anthers are sessile. The name of *Athroandra*, signifying crowded stamens, will serve to distinguish these species whether as genus or section.

COMMELYNACEÆ.

1. *Cyanotis Abyssinica*, *A. Rich.*? *Flor. Abyss.* ii. 344.

Hab. Clarence Peak, alt. 9000 ped. (fl. Dec.)

A fine species, remarkable for its round tuberous roots, the size of a hazel nut. It may be the same with a Madagascar and South African species, but the extremely fugacious flowers are very difficult of analysis, and judging from dried specimens, I hardly think them the same.

ORCHIDEÆ.

[*By Dr. Lindley.*]

1. *Calanthe*, sp. nov.? *C. Natalensi*, *Reich.*, proxima.

Hab. In Clarence Peak, alt. 6000 ped.

Herba 1 $\frac{1}{2}$ " alt. Corolla alba et purpurea.

* *Claoxylon (Athroandra) Barteri*, H. f. Glabrum, gemmis perulatis, foliis ovato-lanceolatis abrupte acuminatis erenatis junioribus pilosis basi eglandulosis, fl. masc. parvis in pedunculum brevem gracilem sessilibus v. pedicellatis, perianthio 4-lobo, lobis valvatis, antheris ut in *C. Mannii*. *Fl. fœm.* stigmatibus parvis.

Hab. Flum. Niger ad Gomba, Eppah et Lagos,—beat. *Barter.* *C. Mannii* arcte affinis, differt foliis latioribus, parvis, 1"-2" long. obsolete acuminatis basi non biglandulosis, floribus multoties minoribus et stylis brevibus.

2. *Habenaria*, sp. nov. *H. peristyloides*, *A. R.* (Abyssiniæ) et *H. præulta Thouars* affinis.

Hab. Ad cacumen Clarence Peak.

3. *Polystachya*?

Hab. Clarence Peak, alt. 6000 ped.

Epiphytica, species singularis et distinctissima. *P. capensi*, Sond., et *Ottonianæ*, Reichb., habitu similis.

4. *Bolbophyllum*, sp. nov.

Hab. Clarence Peak, alt. 5000 ped.

Epiphytica, *B. flavido* (Sierra Leone) affine.

JUNCEÆ.

1. *Luzula campestris*, *L.*

Hab. Ad cacumen Clarence Peak, alt. 10,700 ped. (fl. Dec.)

I have seen no other Tropical African specimens of this plant, nor is any species of the genus mentioned in Richard's 'Flora of Abyssinia.' There is, however, a very similar plant in South Africa.

CYPERACEÆ.

1. *Carex Boryana*, Schkuhr. Forma spica depauperata. (*Boott.*)

Hab. Clarence Peak, 8500 ped. (fl. Dec.)

Dr. Boott, who has identified this and the following for me, observes that he has a similar form from Bourbon, of which isle and Abyssinia this is a native.

2. *Carex Wahlenbergiana*, *Boott.* Illust. *Carex*, t. 301.

Hab. Clarence Peak, alt. 8000 ped. (fl. Dec.)

Of these specimens Dr. Boott remarks, that it has pale spikes, and shorter narrower bracts and leaves than the fully developed plants; but that he has the same pale spikes and narrow (but longer) leaves in Bourbon specimens. It is also a native of Mauritius.

3. *Kyllingia macrocephala*, *A. Rich. Flor. Abyss.* ii. 491.

Hab. Clarence Peak, alt. 8500 ped. (fl. Dec.)

I am very doubtful if this is anything but a form of the ubiquitous *K. monocephala*: the scales are however larger and of a somewhat different shape. Stamens 2.

4. *Isolepis trifida*: cf. *T. pusilla*, *Hochst.*, et *T. gracillima*, *Hochst.*

Hab. Ad cacumen Clarence Peak, alt. 10,700 ped. (fl. Dec.)

A common Indian plant, extending westward to Abyssinia and Senegal, and eastward to China.

5. *SCHÆNUS?* *ERRATICUS*, *H. f.* *Pusillus*, *glaberrimus*, *rigidulus*, *caule basi bulboso*, *foliis filiformi-setaccis rigidis curvis supra canaliculatis subtus convexis*, *culmis nudis curvis filiformibus sulcatis apice monocephalis*, *capitulo ovoideo compresso e spiculis 1-3 piceis compressis*

composito, involuero 1-3-phyllo spiculis brevioribus, foliolis ovato-lanceolatis acuminatis dorso carinatis, spiculis 5-8 lineari-oblongis compressis vix distiche imbricatis.

Hab. Clarence Peak, alt. 9000 ped. (fl. Dec.)

Herba 3-6-uncialis, culmis basi subbulbosis folia longe superantibus.

Folia 1-2 pollicaria sulcata, acuminata, vix $\frac{1}{4}$ " diam. vaginis brevibus rufis non nitentibus. *Capitulum* $\frac{1}{2}$ " long. *Spiculæ* confertæ, lineari-oblongæ, squamæ sub 8-10, infimæ paucæ latiores vacuæ, cæteræ subæquilongæ, oblongo-lanceolatæ, acutæ, vix carinatæ, opacæ, glaberrimæ. *Stamina* 3, discus et setæ hypogynæ 0. *Ovarium* parvum oblongum trigonum, stylo gracili basi simplice, stigmatibus 3 filiformibus.

I am doubtful of the genus of this plant; the scarcely distichous scales of the spikelet differing from *Schœnus*, to which it is otherwise referable. The scales are, however, not always regular in *Schœnus nigricans*, and in *Chætospora*, which must surely be reduced to *Schœnus*, the scales are sometimes imbricated all round. A. Richard's *Hemichlæna bulbosa*, to which this is a good deal allied, has distichous scales, but this plant differs materially from *Hemichlæna* in wanting the disk. I do not see how it differs from *Cyperus*, with many species of which it further agrees in the margins of the scales decurrent on the rachis.

GRAMINEÆ.

1. *Deschampsia cæspitosa*, P.B. *D. latifolia*, Hochst.; A. Rich. Flor. Abyss. ii. 413.

Hab. Clarence Peak, alt. 10,100 ped.

Also found in Abyssinia and most other temperate parts of the globe, but not hitherto in South Africa.

2. *Trisetum lachnanthum*, Hochst.; A. Richard. Flor. Abyss. ii. 416.

Hab. Clarence Peak, alt. 7900-9000 ped. (fl. Dec.)

A very distinct species, closely allied to *T. virens*, Nees, of the Indian mountains.

3. *Festuca Schimperiana*, A. Rich. Flor. Abyss. ii. 433.

Hab. Clarence Peak, alt. 8500 ped. (fl. Dec.)

The spikelets are rather larger than in the Abyssinian specimens, but the species is evidently the same.

4. *Brachypodium sylvaticum*, R. & S.

Hab. Clarence Peak, alt. 7000 ped.

A native of Abyssinia (*B. flexum*, Nees).

5. *Gymnandropogon*, sp. ? (*Schimper, Plant. Abyss. 1853, No. 1006.*)

Hab. Clarence Peak, alt. 9000 ped. (fl. Dec.)

This, which approaches very closely *A. glabriusculus*, Hochst., of Abyssinia, further seems identical with another and perhaps undescribed species of that genus, collected by Schimper, and quoted above.

Note on an unusual mode of Germination in the Mango—
Mangifera Indica. By MAXWELL T. MASTERS, Esq., F.L.S.

[Read April 4th, 1861.]

IN the Museum of the Royal Gardens at Kew, are preserved two specimens of the Mango in an advanced stage of germination, which present some peculiarities that may be deemed worthy of bringing under the notice of the Society. For the opportunity of examining and describing these curious plants, I am under great obligations to Dr. Hooker, and to Mr. Jackson the curator of the Museum. From these gentlemen I learn that the seeds in question were sent home by the late Mr. Barter, when accompanying Dr. Baikie on his second Niger Expedition in 1857, and were reared by Mr. Crocker at Kew.

From the appearance that these young plants presented on cursory inspection, and perhaps from the knowledge that the seeds of the Mango are occasionally poly-embryonous, the specimens were described in these words, "one mango seed producing many plants." The closer examination which I have been enabled to make leads me to conclude that there are, in reality, two seeds, presenting such peculiar appearances, especially when placed, as they were, in close apposition one to the other, as readily to give rise to the opinion before expressed. This will be understood at once by the circumstance of there being only two cotyledons present, from between which a great number of shoots apparently emerge. In one of these two seeds (*fig. 1.*) one cotyledon is present, though partly decayed and truncated at its upper part, possibly by some accident during growth; the other seed-leaf is absent, but there is a scar distinctly visible, indicating its original position. The plumule presents itself as a long, thick, fleshy, curved body, presenting no trace externally of leaves or buds; in the axil of the cotyledon, between it and the plumule, arises a leaf-bearing shoot, presenting no unusual features. The radicle is thick and tapering, and gives off a few slender rootlets. The second seed (*fig. 2*) is likewise deprived of one of its cotyledons, but the scar remains to attest its former presence. From the appearance of the tissues in the immediate vicinity of the scar, the missing seed-leaf seems to have perished from some cause inducing gradual decay, rather than from any injury or traumatic cause, to use a surgical expression. The existing cotyledon is oblong, oblique at the base, the outer surface convex, wrinkled on the upper half, while the lower half is scooped out and smooth like the inside of a shell. From this portion proceed

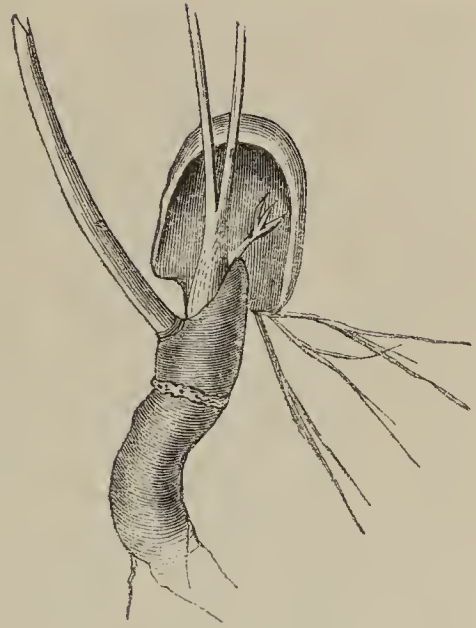
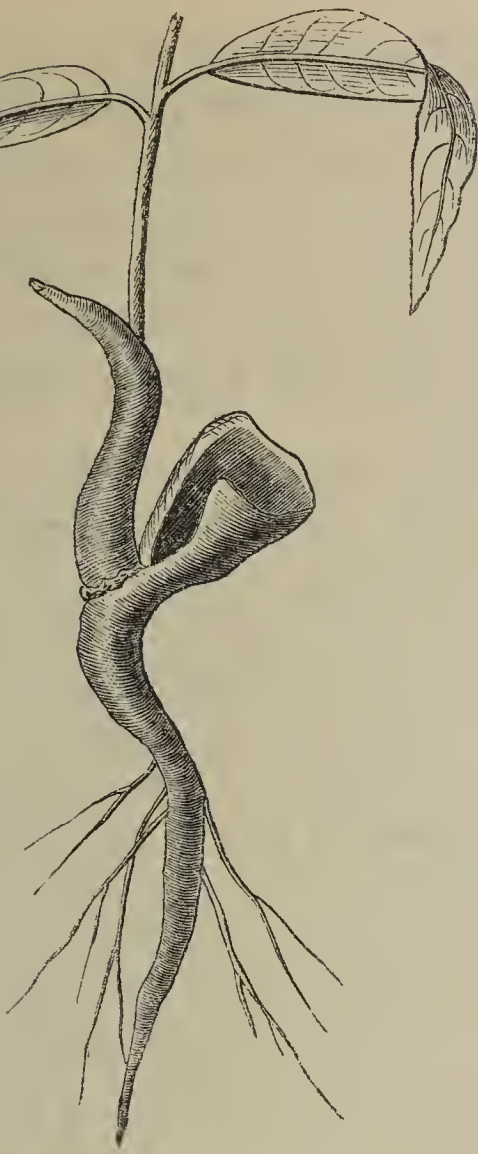


Fig. 3.



Fig. 2.

Fig. 2 outer } aspect of same seed. See reference on other side.
Fig. 3 inner }

a number of adventitious roots. The inner surface (fig. 3) is concave, and offers no unusual appearance; the plumule in this instance is short, thick, fleshy, conical, and gives off, not from its summit, but from its side, some distance above the attachment of the cotyledons, three leafy shoots, one of which is small and but slightly developed, and another is divided into two branches a short distance above its origin. The radicle has a similar appearance to that of the first-mentioned seed.

To sum up the peculiarities presented by these specimens, there is, first, the entire absence of one of the cotyledons in both instances; next, the peculiarity of the plumule, in the one case giving off no shoot at all, in the other giving rise to three shoots from its side; and, lastly, there is the production of adventitious roots from the "scooped-out" portion of the cotyledon.

I do not know any instance of plumules presenting the peculiarities just mentioned, nor have I been able to find on record any case of adventitious roots springing from the cotyledons themselves, though there is no physiological or anatomical reason why, under certain circumstances, adventitious roots should not be developed in such a situation. Irmisch indeed describes similar rootlets arising from the petiole of the cotyledon in *Bunium creticum* and *Carum Bulbocastanum**.

The scooping out of the lower half of the outer surface of the cotyledon may not be an unusual occurrence in mango seeds, though it is certainly not invariable. Griffith describes the cotyledons of this plant as oblique at the base, with half of their outer surface wrinkled, half smooth, sometimes auricled, sometimes not, sometimes of different sizes. The plumule he describes as "stalked and well-marked." Gaertner figures seeds of this plant with apparently lobed cotyledons, the lobes being, as Reinwardt† shows, really separate seed-leaves belonging to distinct embryos; but the descriptions given by these writers by no means apply to the cases I have attempted to describe; nor does Alexander Braun, in his recently published memoir on 'Polyembryonous Plants,' among which mention is made of the Mango, describe anything like them.

* Flora, 1858, pp. 33-42.

† Reinwardt, Nov. Act. Acad. Car. Leop. Nat. Cur. 9-24, 4to, 12, 1, 37.

REFERENCE TO THE WOODCUTS.

The figures are one half the size of the originals; Nos. 2 and 3 refer to the outer and inner aspect of the same seed respectively, but the details of the foliage, etc., are omitted in No. 3.

Account of the Ascent of Clarence Peak, Fernando Po, altitude 10,700 feet. By Mr. GUSTAV MANN, Botanist to Dr. Baikie's Niger Expedition. In a Letter to Sir W. J. HOOKER, F.R.S., F.L.S., &c., and communicated by him.

[Read March 7, 1861.]

SIR,—As I informed you already in my letter before last, that I did not succeed at my first trial in ascending the mountain, I will give you now an account of my second trip, which was successful. On the 23rd of March I left Clarence for the second time, and commenced my ascent from here, keeping first eastwards and then turning south, and attaining the first day a height of 1300 feet. After I had passed two large Boobee towns, Barapa and Basile, finding the vegetation already quite different, I stopped to collect the few plants in blossom, and some nice Ferns, especially Trichomanes and Aspleniums. The trees were much overgrown by Orchids, Ferns, and Begonias, while moss hung a foot in length from the branches: there was in consequence much dry wood at the top of the trees. There were no Palms, nor herbaceous plants 15 feet high, as in the lower part. The temperature here in the mornings was 64°, at noon 70°, and in the evenings 66° Fahr. At about 1000 feet up I found the fine large Trichomanes growing on the ground, and the large Acrosticum?: these I sent in the Wardian case, and have dried specimens of both still here.

On the 27th of March I ascended to a height of 5000 feet: during this ascent I found the fine Cyathea. This species seems to form larger groups than other Cyatheas do, many averaging from 10–15 trunks, some of which rise to a height of 30 feet. The Onychium? of which I sent a specimen in the Wardian case, grows only as an epiphyte on this tree-fern. I also found on this ascent the fine Antrophyum?, resembling the Platycerium of the tropical part of the island; and the Liliaceæ, of which I sent six bulbs; and the Calanthe like Veratrifolia. All the Trichomanes grew between 1000 and 5000 feet. At this height I stopped one day, and ascended on the 28th to a height of 6000 feet, and on the 29th to 8500 feet; up to which height I found very little difference in the vegetation. From this place I was obliged to send a Krooman down to fetch more provisions, which, together with daily rain, obliged me to remain here six days. During this time I was compelled to sleep on the wet ground, placing my blanket

and other things under an oil-cloth when the rain commenced at night, and selecting for myself a dry place where the rain did not come through the small roof of palm-leaves. This, under a temperature of 42° Fahr. at night, was a trial to my health; but one must learn everywhere, and I have learnt a great deal since I came here. The vegetation here consists mostly of herbaceous plants, as Gramineæ, *Salvia*, *Rubus*, &c. The largest trees here (50 feet high) are Araliaceæ and Compositæ. On the 3rd of April I reached the top, about two o'clock in the afternoon. Unfortunately a storm of rain and hail spoilt the enjoyment with which I should otherwise have seen the whole island spread out before me; but what was worse than this, I found the entire summit burnt, and no vegetation except grass, which was just beginning to sprout. This is done by the Boobees, to drive the deer to the lower part of the island. I did not meet with a Boobee above 1000 feet elevation. The top is formed by the highest side of the largest crater, which is about 40 feet deep. There is good and deep soil up to the top, and only on the inside of the largest crater are a few rocks visible. Lower down there are more small craters. At this time the temperature was 54° F., and the minimum at night 39° F.

Shrubs grow to between 400 and 500 feet of the top, and amongst them I found an *Erica* 8-10 feet high, which gave me much pleasure. I regret very much that I could not stop some days longer, but I ran the risk of making myself a cripple for life; I therefore commenced my descent on the 4th. Again it was too late in the season, for which reason very few plants were in blossom.

At the bottom of the highest part I found a small lake, perhaps only the result of the very heavy rain of the last few days. The large *Hypericum* forms the greatest part of the bush, and has a very pretty appearance from its fine light-green foliage. The first day I descended to 5000 feet, and on the 5th I went down to 1300 feet, where I remained six days, making excursions in different directions. The tree-fern and other living plants were collected the day before I set off on my return to Clarence, which place I reached on the 13th of April, and immediately commenced the arrangement of my plants, &c., being anxious to send away my collections by the last mail. After coming down from the mountain I needed a little rest, but having this work before me, I rather overworked myself, and took fever, which was the reason why I did not write to you by the last mail. I should be very

glad to hear how the plants and specimens reached Kew, and if all was done to your satisfaction. It would also give me much pleasure if I heard that there was anything new among them. Yesterday I obtained a fruit spike of *Raphia vinifera*, 6 feet long, and so heavy that two men could scarcely carry it. *Raphia* is scarce on this part of the island, but is more abundant on the eastern side, because that part is lower, and this palm prefers a low swampy situation. It is much used, all the houses being roofed with its leaves. Next time I will send you some mats made from it, as they may be of interest for the Museum. At the north-west bay of the island an excellent sort of yam grows, quite like a good potato; on the eastern side they grow much larger, but are not nearly so good in quality. On the eastern side I also found good cotton, growing quite wild, and only gathered by the people when they have nothing else to do.

The whole island is uncultivated, with the exception of a small part near Clarence, for the yam-fields can scarcely be considered as cultivation. From February until now is the active time of year. In February the Boobees plant their yams, and in March the palm-oil season commences: the men bring home the nuts, and the women make and sell the oil. The island would yield ten times as much palm-oil, if the Boobees would make use of all that is growing; but these people have so few necessaries of life that they are not to be depended on.

To ascend the mountain one needs a good oiled tent with a hammock, and tin boxes to put everything in: an hour after I had dried my plants by the fire they were wet again, and I had therefore great difficulty in preserving them. It also requires at least six Kroomen to assist in the dry season. I have now quite recovered my health, and hope shortly to benefit by change of air when the ship goes up the river. I never thought that the difference of climate on the mountain and here would have had so much effect on me. On the mountain I enjoyed good health, except that I took a bad cold, from not having a sheltered place at night. By this mail I expected instructions from the Foreign Office, since till now I have received none at all, except that money has been granted to live on, and to go up the mountain, and for one Krooman to assist me. If the Expedition goes up the Niger again (which is doubtful), the collections will be entirely different.

I enclose a little sketch of the Consulate, thinking it may be of interest to you. Consul Hutchinson and his lady are going home

to England; I shall thus lose a very kind friend, who has been like a brother to me. I heard from Mr. Hewen that you had inquired if it were possible to ascend the mountain of Bimbia or Cameron. You will hear shortly that it is quite impossible, and only killing men to send them up there; this, however, was also told me before I went up Clarence Peak. It is, no doubt, *very* difficult, but it is possible; only too much must not be expected from the first trip. Much might be gained by a second ascent; as would also, I think, be the case, if I could ascend the Peak here again, and remain there for some months during the dry season. To stop there in the wet season is quite impossible, and would be certain death.

GUSTAV MANN.

Clarence, Fernando Po,
May 31st, 1860.

On the Discovery of *Carex ericetorum*, Poll., as a Native of Britain.
By CHARLES C. BABINGTON, M.A., F.R.S., F.L.S., Professor
of Botany in the University of Cambridge.

[Read June 20, 1861.]

SEVERAL months since my friend Mr. John Ball, F.L.S., sent to me a specimen of *Carex*, gathered by him on the Gogmagog Hills in Cambridgeshire in the year 1838, and upon a careful examination of my Herbarium I found four specimens of the same plant, gathered at the same place on May 3, 1838, and probably in company with Mr. Ball. This plant was supposed by Dr. Boott to be the *C. ericetorum*, Poll. On referring to my notes I was enabled to ascertain the places visited on the above-mentioned day, and have lately revisited them more than once. At length, on May 28, 1861, I was so fortunate as to rediscover a single rather large patch of the same *Carex*, growing on the grassy slope of the Roman road, locally called the Wool Street, at about four miles and a half from Cambridge, and probably not far from the spot where it was gathered in 1838.

As I have now no doubt of its being the *C. ericetorum*, and a true native of the country, I venture to announce it as an addition to the British flora. This is no "split" from a recognized species, but a plant allowed by botanists to be a true species. At first sight it much resembles *C. præcox*, and inhabiting similar ground, may have been overlooked in many places. To the practised eye it has a decidedly different appearance when growing;

for the white edge of the scales of both kinds of its spikes gives it a silvery look very different from the dark hue of the *C. præcox*. The place where it grows is chalky and very dry, and there is an abundance of *C. præcox* in its neighbourhood. Although I have as yet only met with one patch of it, its restriction to that one spot is highly improbable; but unfortunately the chalk district of Cambridgeshire is so universally under the plough that few fit places for its growth now remain. It should be carefully looked for in similar places elsewhere in the south-east of England.

It may be known by the following characters:—Its fertile spikes are more ovoid and closer together than those of *C. præcox*; its glumes obovate, very blunt, with a pale margin, which is finely ciliated, especially at their tip; their midrib does not reach to the tip; its fruit is obovate. The nut I have not been able to examine, owing to the young state of the fruit. My specimens are about 3 or 4 inches high.

It is the *C. ericetorum* of Pollick (*Fl. Palatin.* ii. 480. A.D. 1777) and of other authors, the *C. ciliata* of Willdenow (in *Act. Berol.* for 1794. p. 47. t. 3. fig. 2) and others. The latter name would be much more characteristic of the plant, but the dates of publication conclusively determine that Pollick's name must be adopted.

On some Species of Oaks from Northern China, collected by
W. F. DANIELL, Esq., M.D., F.L.S. By WILLIAM CARRUTHERS, Esq., F.L.S.

[Read June 20th, 1861.]

ON returning from the late expedition to China, Dr. Daniell placed in my hands the specimens of several oaks which he had gathered on the shores of Taliewhan, a bay running into Southern Manchouria, to the west of the Corea, and chiefly in a small valley about a mile from the sea, where they grew mixed with *Pinus densiflora*, Sieb., *Salix Babylonica*, L., &c. The specimens belong to six species, three of which are new and undescribed. Two of these species, however, want flowers and fruit, and although remarkable in the shape and characters of their leaves, and different from anything hitherto noticed, I have not ventured to name and describe them from the foliage only. I have added a fourth species which I found among the plants, now in the Herbarium of the British Museum, brought home by Sir George Staunton from Northern China.

All of them, in which the fruit is known, belong to Blume's

section of the genus characterized by the acorn cup having imbricated scales, and named by Endlicher *Lepidobalanus*. They are

- | | |
|-----------------------------------|--------------------------------------|
| 1. <i>Q. obovata</i> , Bge. | 5. <i>Q.</i> —sp. ? |
| 2. <i>Q. Mongolica</i> , Fisch. | 6. <i>Q.</i> —sp. ? |
| 3. <i>Q. McCormickii</i> , n. sp. | 7. <i>Q. acuminatissima</i> , n. sp. |
| 4. <i>Q. serrata</i> , Thunb. | |

1. *Quercus obovata*, Bge. *Mem. St. Petersb.* vol. ii. p. 136.

Hab. From Taliewhan, *Dr. Daniell*; and between Pekin and Jehol, *Sir George Staunton*.

2. QUERCUS MONGOLICA, Fisch; *Ledebour Flora Rossica*, vol. iii. p. 589. Foliis petiolatis vel subsessilibus obovatis, basi auriculata sinuato-lobata, a medio ad basin cuneato-attenuatis sinuato-lobatis, lobis sursum versis subacutis muticis a medio utrinque decrescentibus, sinibus acutis, subtus glaucis glabris; cupula squamis adpressis gibbosis sericeis muricata, squamis superioribus parvis cupulam non excedentibus; nuce ovata cupulam duplo excedente styli basi apiculata.

Hab. From Taliewhan, *Dr. Daniell*; and between Pekin and Jehol, *Sir George Staunton*.

From the fine specimens given me by *Dr. Daniell* I have slightly amended the character of this species: this was the more needed to separate it clearly from the following.

3. QUERCUS MCCORMICKII. Foliis breviter petiolatis obovatis, basi lobata, a medio ad basin cuneato-attenuatis sinuato-lobatis, lobis sursum versis rotundato-obtusis muticis a medio utrinque decrescentibus, sinibus acutioribus, subtus glaucis, glabris vel rarius subtus ad venas pilis raris obsitis; cupulæ squamis externis triangulatis sericeis, internis membranaceis lineari-lanceolatis margine et apice ciliatis cupulam valde excedentibus; nuce rotundata cupulæ squamas vix excedente styli basi apiculata.

Hab. From Taliewhan, *Dr. Daniell*.

The difference between the foliage of this species and the preceding is so trifling, that, but for the fruit, it would be difficult to separate them. The shape of the acorn, and especially the scales of the cup, however, supply obvious and striking peculiarities. Instead of the compact scales of *Q. Mongolica*, Fisch., the cup is nearer that of *Q. obovata*, Bge.; but the scales are more compact, shorter, and more erect.

4. *Quercus serrata*, Thunb. *Flor. Jap.* p. 176.

Hab. From Taliewhan, *Dr. Daniell*.

5. *Quercus*, sp.

Hab. From Taliewhan, *Dr. Daniell*.

This is a shrub, growing to the height of 6–10 feet. It appears to be nearly related to *Q. serrata*, Thunb., both having the leaves glabrous above and glaucous below, from a compact covering of small white hairs, and having also the veins running out into setæ; but the

uniform obovate shape of the leaves, and the almost entire absence of the petiole (scarcely exceeding a line in length, as opposed to an inch in *Q. serrata*, Thunb.) strikingly separate it from that species.

6. *Quercus*, sp.

Hab. Taliewhan, *Dr. Daniell*.

This is also a dwarf oak, from 6 to 10 feet high. It differs from *Q. Chinensis*, Bge., which seems to be its nearest ally, in wanting the glaucous or canescent covering on the under surface of the leaf (both sides being equally glabrous, and nearly of the same colour), and in the remarkable panduriform shape of the nearly sessile leaf. The petiole is 1-2 lines long.

7. *QUERCUS ACUTISSIMA*. Foliis petiolatis, e basi rotundata vel obtusiuscula ovato-lanceolatis acutissimis serratis, serraturis setaceo-excurrentibus, venis et setis sursum spectantibus glabris; fructibus breviter pedunculatis; cupulæ squamis sericeis, externis parvis, internis elongatis subulatis cupulam excedentibus.

Hab. Chinese province of Kiangsi, *Sir George Staunton*.

The form of the leaf separates this species from the last, and the glabrous under-surface as well as the remarkable difference in the fruit separate it from *Q. serrata*, Thunb., under which name specimens of it have been distributed by Dr. Asa Gray. The veins and the setæ are directed more upwards than in the allied species. The petiole is 5-8 lines long.

On the identification of the Grasses of Linnæus's Herbarium, now in possession of the Linnean Society of London. By Colonel WILLIAM MUNRO, 39th Regt., C.B., Chevalier of the Legion of Honour, F.L.S., &c.

[Read April 4th, 1861.]

I BEG to offer to the Linnean Society, as the envied possessors of the original authenticated collections of Linnæus himself, the accompanying notes on the identification of the various grasses contained in his Herbarium.

Hoping that ere very long I shall be able to offer to botanists a full account of all grasses at present known in collections, I have devoted considerable time to the identification of the species of the earliest authors, with the view of clearing up some of the numerous mistakes in synonymy, which add so very much to the labours of any systematic botanist who wishes to treat any natural order in a really scientific spirit. Amongst grasses I find the errors extraordinarily numerous. Many of these might have been avoided by consulting herbaria easily accessible; and very many might

have been avoided by a little care, and less anxiety for the creation of species. With many, a difference in locality seems to have been quite sufficient reason for giving a different specific name. This idea was not consequent on following in Linnæus's steps. In the comparatively few mistakes he has made, he has erred in the contrary direction, and placed in one species two or three very different plants. In another respect Linnæus's example might have been well followed. He had great regard to the priority of names; and although he was the first to apply specific ones, he has frequently, as his MSS. show, altered his own, because he found previous terms, that would answer for specific and generic names, had been used by Gronovius, Scheuchzer, and others. Linnæus appears to have paid great attention to the Gramineæ. The specimens are in remarkably good condition, and in only two instances are they insufficient for absolute identification.

The numbers in the Herbarium refer to those used in the first edition of the 'Species Plantarum,' Linnæus's own copy being very carefully marked by himself. In the following list I have used these numbers, *underlining* them, as was done by Linnæus himself, thus 1, 2, &c., to imply that the plant was actually in the Herbarium. When Linnæus's name remains unaltered in the best authors of the present day, I have marked the plant with ! after the name, as, 1. *Lygeum Spartum*, L. ! I have carefully examined every grass in the Herbarium; and in annexing the following list of names which I consider they should bear, I trust the list may be of some little use to botanists who are unable to consult the Herbarium itself. I have inserted all the names contained in the following works by Linnæus:—first, all in the 1st edition of the 'Species Plantarum,' published 1753; then all extra in the 2nd edition, published in 1762; then all in the two Parts of the 'Mantissa' (as far as p. 143 published in 1767, and from that to the end in 1771), which Linnæus styles a supplement to the 6th edition of the 'Genera Plantarum' and to the 2nd edition of the 'Species Plantarum.' I have also included all published in a paper entitled "A First and Second Century of Plants collected in various parts of the world, by Kalm, Osbeck, Loeffling and others," in the 4th volume of the 'Amœnitates Academicæ' (1759), and, further, all grasses contained in a paper on the plants of Jamaica sent by Browne, in the 5th volume of 'Am. Acad.' (1760). These, with the exception of about half-a-dozen described in the 'Systema Naturæ,' also included in this list, appear to me to comprise all the grasses for the nomenclature of which Linnæus is personally responsible.

I have also occasionally added a few notes on some of the grasses of the younger Linnæus, which are in the Herbarium.

Stoke Bishop, near Bristol,
February 18th, 1861.

CINNA, *Sp. Pl.* 1st edit. p. 5.

1. *Cinna arundinacea*, L.! The specimen is from the Upsal Garden, raised from seeds sent by Kalm from North America, where the plant is common. In the same envelope, without number or locality, is a specimen of *Hymenachne Myurus*, P. de B.

ANTHOXANTHUM, *l. c.* p. 28.

1. *A. adnatum*, L. The well-known vernal grass. The only species, in the Herbarium, of the genus.
2. *A. Indicum* is stated to be No. 25 Fl. Zeyl., which is in Hermann's Herb. vol. v. fol. 29, and is *Perotis latifolia*, Ait., very fairly figured by Plukenet, t. 119. f. 1.
3. *A. paniculatum*, described by Linn. as having 4-flowered spikes. I am unable to decide positively what this is; but Kunth is probably correct when he states it is a synonym of *Festuca spadicea*, Gouan.

NARDUS, *l. c.* p. 53.

1. *N. stricta*, L.!
2. *N. Gangitis* is *Lepturus incurvatus*, Trin. The specimen collected at Montpellier. Much confusion has been occasioned by the drawings erroneously quoted by Linnæus. Lobel, Icon. 84 is one of leaves only, and is, I believe, *Andropogon laniger*, Desf.; Morison, t. 13. f. 8 is *Ctenium Americanum*; hence Kunth quotes *N. Gangitis*, Linn., as a synonym of that plant. Why the name *Gangitis* was given to a plant collected in the South of France, it is difficult to explain, except from some confusion regarding Lobel's plant, which is one of those believed to produce the Nard of the ancients. The specimen is to be found amongst *Festuca*, q. v.
3. *N. ciliaris* is *Ischæmum leersioides*, Munro in Seemann's Herb.
4. *N. articulatus*. There is no specimen of this; and it is omitted in the 2nd edition.

N. aristatus, 2nd edit. p. 78, from Rome, is *Psilurus nardoides*, Trin.

N. Indica, Linn. Herb., is *Microchloa setacea*, R. Br.

N. Thomæ, Linn. Herb., is *Oropetium Thomæum*, Trin.

LYGEUM, *Sp. Pl.* 2nd edit. p. 78.

1. *L. spartum*, L.!

CORNUCOPIÆ, *Sp. Pl.* 1st edit. p. 54.

1. *C. cucullatum*, L.!

C. alopecuroides, Mant. p. 28 (1767), is *Alopecurus utriculatus*, Pers.

SACCHARUM, *l. c.* p. 54.

1. *Saccharum officinarum*. The specimen marked by Linnæus himself is not the true Sugar-cane, but is *Erianthus Japonicus*, P. de B. It is also wrongly marked in pencil, "*Sacch. polystachyum*, Sw.?" which is *Panicum ferrugineum*, Kunth. The reference to Sloane, Jam. p. 108, t. 66, is correct, that being a very fair drawing of the true Sugar-cane.
2. *S. spicatum* is *Imperata arundinacea*, Cyrill. One specimen is from C. B. S., and another has been named by Smith *Perotis latifolia*, β , Willd., i. 324, where, however, the confusion is very great, two or three different plants being confounded together.

S. spontaneum, L. ! Mant. p. 183, from Koenig.

S. Ravennæ, Linn. Herb., is *Erianthus Ravennæ*.

PHALARIS, *l. c.* p. 54.

1. *P. Canariensis*, L. !
2. *P. phleoides* is *Phleum Boehmeri*, Wib.
3. *P. arundinacea*, L. !
4. *P. erucæformis* is *Beckmannia erucæformis*, Host.
5. *P. oryzoides*. One, from Gronovius, is *Leersia oryzoides*, Sw. ; another specimen, from Browne, is *Leersia hexandra*, Sw.

The following also in Herbarium :—

P. bulbosa, Amœn. Acad. iv. 264 ; 2nd edit. *Sp. Pl.* p. 79, is *Phleum tenue*, Schrad.

P. aquatica ! Am. Ac. *l. c.*

P. zizanioides, Mant. 183, is *Andropogon muricatus*, Retz.

P. tuberosa, Mant. 557, is marked by Smith as *P. nodosa*, *Syst. Veg.*, and is the plant now so called.

P. paradoxa, Linn. Herb., from Upsal Garden, is the plant so called now. In MS. notes to 1st edit. it is called by Linn. *P. utriculosa*, with a marginal note "*P. paradoxa*, 1665."

PASPALUM

is not a genus of the 1st edit., but appears in the 2nd, p. 81 ; and the following species are in the Herbarium :—

P. dissectum, L.! From North America, *Kalm*. This was published in 1st edit. *Sp. Pl.* p. 57, as *Panicum dissectum*. Pinned to this is a specimen of *Paspalum conjugatum*, Berg.

P. virgatum, L.! From Browne, well figured by Sloane, t. 69. fig. 2.

P. paniculatum, L.! Another specimen, pinned to this, and also marked *paniculatum*, is *Paspalum fluitans*, Kunth.

P. distichum! *Amoen. Acad.* v. 391, from Jamaica, *Browne*.

P. scrobiculatam, L.! *Mant.* 29. Raised in the Upsal Garden, from seeds received from India.

A plant marked by Linn. "*Paspalum*," and by Smith "*pubescens*, Br. *Prod.* i. 188?" is *Paspalum granulare*, Trin.

In the same envelope, merely marked C. B. S., is a specimen of *Eustachys petraea*, Desv.

PANICUM, *Sp. Pl.* 1st edit. p. 55.

1. *P. alopecuroideum* is *Gymnothrix Thouarii*, P. de B. Received by Linnæus from China. The reference to Plukenet, t. 119. f. 1, is incorrect, as that is *Perotis latifolia*, Ait. The reference in 2nd edit. f. 82, to Pluk. t. 92. f. 5, is probably correct.
2. *P. polystachyum*. The specimen is *Pennisetum barbatum*, Schult. Another, from the Upsal Garden, is *Setaria glauca*, P. de B., stated to have been raised from American seeds. Another is *Setaria viridis*, P. de B., and another, also marked 2, and pinned to the others, is *S. verticillata*, P. de B.
3. *P. Americanum*. There is no specimen in Herb.; and the plant is omitted in the 2nd edition.
4. *P. Italicum* is *Setaria Italica*, Kunth. Another specimen, from Upsal Garden, is named *P. Germanicum* by Linnæus.
5. *P. Crus Galli*, L.! A small state, from *Kalm*.
6. *P. dissectum*. Already referred to as *Paspalum dissectum*.
7. *P. dimidiatum* is *Stenotaphrum Americanum*, Schrank. The specimen from India.
8. *P. (Digitaria) sanguinale*! L.
9. *P. filiforme*, from *Kalm*, is *Paspalum filiforme*, Sw. This contains also a piece of *Muhlenbergia diffusa*, Willd. Another sheet, from Upsal Garden, contains *P. sanguinale*, L.
10. *P. compositum*. The plant was originally described from Fl. Zeyl. 42, and is what is now called *Oplismenus compositus*; but the specimen in the Herbarium is *Oplismenus Burmanni*.

11. *P. dichotomum*, L.! From Kalm, and is the plant described by A. Gray as *dichotomum*.
12. *P. clandestinum*, L.! From Kalm also, a form of *P. latifolium*, L. Linnæus's reference to Sloane, t. 80, is erroneous, as that is a species of *Manisuris*.
13. *P. capillare*, L.! From the Upsal Garden.
14. *P. patens*, L.!
15. *P. dactylon* is *Cynodon dactylon*, Pers.
16. *P. miliaceum*, L.!
17. *P. latifolium*, L.! From Kalm, North America. A specimen attached to this from Carolina is *P. divaricatum*, L., to which Sloane's figure, t. 71. f. 3, belongs; another, marked *latifolium*, is *P. oryzoides*, Sw.
18. *P. brevifolium*, L.! Allied to *P. patens*: The specimen was from India; but the reference to Plukenet, t. 189, f. 4, is erroneous, that being *Isachne australis*.
19. *P. arborescens* is *P. notatum*, Retz. Obs. iv. 18, and is very different from the *arborescens* of Fl. Zeyl. 43, of which there is a specimen in Hermann's Herb., and is probably *P. patens*. On the same sheet in Linnæus's Herb. are some portions of a species of *Arundinaria*, which may have been the origin of *arborescens*.
20. *P. virgatum*, L.! From Gronovius.
- P. verticillatum*, 2nd edit. p. 82, is *Setaria verticillata*: vide No. 2, ante.
- P. glaucum*, l. c. 83, is *S. glauca*, P. de B.
- P. viride*, l. c. 83, is *S. viridis*, P. de B.
- P. hirtellum*, Am. Acad. v. 391, from Jamaica, is *Oplismenus Burmanni*, P. de B. *
- P. Crus Corvi*, L.! 2nd edit. p. 84. From a garden.
- P. colonum*, L.! 2nd edit. p. 84, also marked *P. brizoides*. One from Browne is true *colonum*; another, marked *colonum*, is *Echinochloa Crus Galli*.
- P. lineare*, l. c. p. 85.
- P. grossarium*, L.! Am. Acad. v. 392. This plant is often called *P. pubescens*.
- P. divaricatum*, L.! Am. Acad. v. 392. From Jamaica. This plant has often been confounded with *P. latifolium*, and bears the names of *P. ruscifolium*, *maculatum*, *glutinosum*, and *agglutinans*. Another specimen of *divaricatum* is marked *arborescens* by Smith.
- P. repens*, L.! 2nd edit. Sp. Pl. p. 87. This is *P. arenarium*, Brotero.

- P. brizoides*, Mant. 184, is *P. colonum*. See above.
- P. conglomeratum*, Mant. 324, is, I suppose, the same as *P. Indicum*; there is, however, no specimen so marked.
- P. distachyon*, L. ! Mant. 183. Closely allied to *P. Petiverii*, Trin., with only two spikes.
- P. ramosum*, L. ! Mant. 29, from the Upsal Garden. A common species in India, closely allied to *P. grossarium*.
- P. coloratum*, L. ! Mant. 30, from Upsal Garden. This approaches *P. virgatum* very closely, and is unlike any uncultivated plant I have seen. Smith quotes Jacquin, Icon. Rar. i. t. 12.
- P. curvatum*, L. ! Syst. Nat. xii. 732, is a loosely flowered state of what is usually called *P. interruptum*, Willd. The specimen is marked by Smith as "*Holcus striatus*."
- P. Indicum*, L. ! Herb. Linn., Mant. 184, from Koenig. This is also marked *Panicum Johannaë*. A very small simple state.
- P. incurvum*, Linn. Herb., is a hairy-glumed state of the preceding, also marked by Smith as *Holcus striatus*.
- P. musciparum*, Linn. Herb., which I cannot find described anywhere, is *P. miliare*, Lam.
- P. oryzoides*, Herb. Linn., marked "Ard. Spec. 2, t. 5," is *Echinochloa stagnina*, P. de B.
- No. 516, placed in *Panicum*, is *Sporobolus Indicus*, R. Br.; and No. 513, also so placed, is *Eragrostis brizoides*, N. ab E.

PHLEUM, *Sp. Pl.* 1st edit. p. 59.

1. *P. pratense*, L. !
 2. *P. alpinum*, L. !
 3. *P. arenarium*, L. !
 4. *P. schænoides* is *Crypsis schænoides*, Lam.
- P. nodosum*, *Sp. Pl.* 2nd edit. p. 88, is only a form of *P. pratense*.

ALOPECURUS, *l. c.* p. 60.

1. *A. pratensis*, L. !
 2. *A. geniculatus*, L. !
 3. *A. hordeiformis* is *Gymnothrix cenchroides*, R. et Sch.
 4. *A. Monspeliensis* is *Polypogon Monspeliensis*, Desf.
- A. agrestis*, L. ! 2nd edit. p. 89.
- A. paniceus*, 2nd edit. p. 90, is called *Cynosurus paniceus* in 1st edit., and is *Polypogon maritimus*, Willd.

Alopecuroides, so marked in Linn. Herb., is *Gymnothrix Thouarii*, P. de B.; and another so called is *Penicillaria spicata*, Willd., marked by Smith as "*Alopecurus indicus*, Syst. Veg., sent by Afzelius as *Holcus spicatus mas.*"

MILIUM, *Sp. Pl.* 1st edit. p. 61.

1. *M. effusum*, L.!

2. *M. confertum* is *Piptatherum*.

M. paradoxum, 2nd edit. p. 90, called *Agrostis paradoxa* in 1st edit., is *Piptatherum paradoxum*, P. de B.; and one pinned to it, from Carniola, is *Piptatherum virescens* of Trin.

M. lendigerum, 2nd edit. p. 91, is *Gastridium australe*, P. de B.

M. punctatum, Am. Acad. v. 392, from Jamaica, Browne, is *Helopus pilosus*, Trin.

M. capense, Mant. 185, is *Danthonia (Pentaschistis) papillosa*, N. ab E., or an allied species.

AGROSTIS, *l. c.* p. 61.

1. *A. Spica Venti* is *Apera Spica Venti*, P. de B.

2. *A. miliacea*, from Upsal Garden, is *Piptatherum multiflorum*, P. de B., as also is another, marked *A. sepium*.

3. *A. arundinacea* is *Deyeuxia sylvatica*.

4. *A. rubra*. Not in Herb.

5. *A. canina*, L. ! Smith has marked one specimen of this "*capillaris*, Huds. nec Linn.; *Agrostis vulgaris*, Fl. Brit.; *tenuis*, Sibth."

6. *A. paradoxa* is *Milium paradoxum*, referred to above.

7. *A. stolonifera*. The Herbarium contains one of the forms of *A. vulgaris*, which is called *stolonifera*, the Fiorin Grass; another, marked *stolonifera* by Linn., is *A. verticillata*, Vill.

8. *A. capillaris*, L. !

9. *A. alba*, L. ! An unawned state; and pinned to it is a specimen of *A. canina*.

10. *A. minima* is *Mibora verna*, Adans.

11. *A. Virginica* is *Vilfa Virginica*, P. de B.; and pinned to it is a specimen from Kalm of *Sporobolus heterolepis*, A. Gray.

12. *A. Indica*, from Browne, is *Sporobolus Indicus*, R. Br.; and pinned to it is a specimen of *Polypogon Monspeliensis*, Desf., also marked by Linn. "*Indica 12.*" The reference to Pluk. t. 191. f. 5, is erroneous, as that is *Heteropogon contortus*.

A. Calamagrostis, *Sp. Pl.* 2nd edit. p. 92. Not in Herb.

- A. interrupta*, Sp. Pl. 2nd ed. p. 92. Not in Herb.
- A. radiata*, Am. Acad. v. 392, from Browne, is *Chloris radiata*, Sw.
- A. cruciata*, Sp. Pl. 2nd ed. p. 94, from Browne, is *Chloris cruciata*, Sw.
- A. bromoides*, Mant. 30, is *Aristella bromoides*, Bertol.
- A. australis*, Mant. 30, is *Gastridium australe*, P. de B.
- A. serotina*, l. c. 30, is *Diplachne serotina*, Link.
- A. Matrella*, l. c. 185, is *Zoysia pungens*, Willd.
- A. pumila*, L.! l. c. 31, I think a good species, although included by Kunth and others in *A. vulgaris*. It is about 3 inches high.
- A. Mexicana*, l. c. 31, from Upsal Garden, is *Muhlenbergia Mexicana*, Trin.
- A. Cornucopiæ*, Linn. Herb., from Kalm, is the plant properly so called now, and which has been subdivided into *A. laxiflora*, *A. scabra*, *A. Michauxii*, &c. The naming is not in Linnæus's handwriting.
- A. tenacissima*, Linn. Herb., is *Muhlenbergia sobolifera*, Trin.
- A. maritima*, Linn. Herb., from Klein, is *Vilfa pungens*, P. de B., also *Phalaris disticha*, Forsk.
- A. aurea*, Hall, 1498, is *Agrostis setacea*, Curtis.
- A. No. 20* is *Hymenachne Myurus*, P. de B.
- A. without a specific name* is *Leptochloa virgata*, P. de B.
- The same envelope contains a species of *Chusquea* from Browne, a specimen of *Poa nemoralis*, of *Deyeuxia neglecta*, and *Festuca sylvatica*, none named.

AIRA, *Sp. Pl.* 1st edit. p. 63.

1. *A. spicata*. In the 2nd edition this name is altered to *A. Indica*. It is *Panicum Indicum*, L. The specimen is marked by Linn. "*Panicum*," and a reference is made to Mant. 184, where the plant is described as *Panicum Indicum*. *A. spicata* of 2nd edition, p. 95, is *Trisetum subspicatum*, P. de B.
2. *A. cristata*. Not in Herb. Probably *Kæleria aristata*. See No. 12, below.
3. *A. cærulea* is *Molinia cærulea*, Mœench.
4. *A. arundinacea*. Not in Herb.
5. *A. minuta*. A small state of *Airopsis agrostidea*, Cand.
6. *A. aquatica* is *Catabrosa aquatica*, P. de B.
7. *A. subspicatum* is *Trisetum subspicatum*, P. de B.
8. *A. cæspitosa* is *Deschampsia cæspitosa*, P. de B. A viviparous speci-

men from Lapland is marked by Smith as "*lævigata* fide Don;" a species of *Poa nemoralis* is pinned to it.

9. *A. flexuosa* is *Deschampsia flexuosa*.
10. *A. montana*. Part is *Agrostis rupestris*, All.; part is *Poa flexuosa*, Wahl.; and another, marked "from China, Osbeck," is *Eriachne Hookeri*, Munro in Hb. Hooker., from Assam and Tenasserim.
11. *A. alpina* is *Deschampsia alpina*.
12. *A. canescens* is *Corynephorus canescens*, P. de B.; and pinned to it are two specimens of *Kæleria cristata*, which probably belong to No. 2.
13. *A. præcox*, L.!
14. *A. caryophyllea*, L.! Pinned to it is a specimen of *Poa annua*.

A. capensis, Linn. Herb., is *Ehrharta calycina*, Sm. The same envelope contains a specimen of *Sporobolus Indicus*, and a *Brizopyrum* from C. B. S.

MELICA, *Sp. Pl.* 1st edit. p. 66.

1. *M. ciliata*, L.!
 2. *M. nutans*, L.!
 3. *M. altissima*, L.!
- M. papilionacea*, L.! Mant. 31. From Brazil, *Arduin*. Linnæus also called this, in MS., *M. spectabilis*.
- M. minuta*, L.! Mant. 32.
- M. Falx*, Linn. fil. Supp. 109, is *Harpechloa capensis*, Kunth.
- M. cynosuroides*, Linn. Herb., is *Enteropogon melicoides*, Nees.

POA, *l. c.* p. 67.

1. *P. aquatica* is *Glyceria aquatica*, Sm.
 2. *P. alpina*, L.! Two specimens, one of which is from Lapland, are true *P. alpina*; and there are two of *P. trivialis*. Linn. in MSS. says *alpina* may be a form of *trivialis*.
- β. *vivipara*. Of this there are three sheets, all *P. alpina*, except part of one, which is *Festuca ovina* viviparous.
3. *P. trivialis*, L.!
 4. *P. angustifolia*. One specimen is *P. pratensis*, var. *angustifolia*; and another, pinned to it, is *P. nemoralis*; another is *P. annua*.
 5. *P. pratensis*, so marked by Linn. fil., is *P. alpina*.
 6. *P. annua*, L.!

7. *P. flava*, marked Gron. Virg. 13, is *Poa crocata*, Michx.; but that name should be altered to *P. flava*.
8. *P. pilosa*. Not in Herb.
9. *P. amabilis*, L.! This is the plant which is generally called *P. (Eragrostis) plumosa*, Link. It is also Hermann's species (fide Herb. ii. 59!) from which *Fl. Zeyl.* 46 is described, and is Pluk. t. 300. f. 2, marked in the margin, by Linnæus himself, *P. amabilis*, and to be found in Plukenet's Herb. i. 187, from Cape Comorin. The plant generally called *P. amabilis* is *P. (Erag.) unioloides*, and is also to be found in Plukenet's Herb. l. c.
10. *P. Eragrostis*, L.!
11. *P. capillaris*, L.! One from Kalm; another from Sloane, figured at t. 72; and another from Upsal Garden: all true *P. (Erag.) capillaris*.
12. *P. Malabarica* is *Panicum Arnottianum*, Nees. The reference to Rheede is correct; it is a very fair drawing.
13. *P. Chinensis*, sent by Osbeck from China, is *Leptochloa Chinensis*, Nees.
14. *P. tenella*. There is much confusion about this plant. There is no specimen in the Herb. of what is now considered *tenella*. One from India marked *tenella* by Linn. is the same as No. 9, above, *P. amabilis*; and Linnæus has written a long MS. description on the specimen. Rumph. Amb. 6, t. 4. f. 3, is a good drawing, and is marked by Linnæus himself as *Poa tenella*. Rheede, if correctly quoted, is a miserable drawing. Pluk. t. 300. f. 2 is *P. amabilis*. I therefore consider that all above belong to *P. amabilis*, and that the *P. tenella* ultimately intended by Linnæus is what is now called *Eragrostis tenuissima*, Schrad., is Pluk. t. 190. f. 4, and is in his Herb. i. 186!
15. *P. compressa*, from Upsal Garden, is ordinary *Poa pratensis*.
16. *P. nemoralis*, L.! Seven sheets are correct; one, also so marked, from Kalm, is *Reboulea gracilis*, Kunth; *Reboulea truncata*, Torr.
17. *P. bulbosa*, L.! All viviparous except one specimen with very narrow leaves and extremely similar to *P. ligulata*, Boiss.
- P. palustris*, 2nd edit. Sp. Pl. p. 98. Not in Herb.
- P. rigida*, Am. Acad. iv. 265, is *Festuca rigida*, Kunth.
- P. ciliaris*, L.! Am. Acad. v. 392. From Jamaica, Browne.
- P. spicata*, Mant. 32. Not in Herb.
- P. distans*, Mant. 32, is *Sclerochloa arenaria*, Nees. This is marked by Linnæus "*Aira aquatica*."

A plant marked *Poa* by Linn., and *Aira cristata*, No. 14, by some other person, is *Kæleria cristata*, Pers.

“*Poa juncea*, &c., Hall. Hist. 1459,” is *Festuca spadicea*, Gouan. The same envelope also contains a specimen of *Poa arctica* and *Eragrostis bifaria*, Vahl, both unnamed.

BRIZA, *Sp. Pl.* 1st edit. p. 70.

1. *B. minor*, L.!
2. *B. media*, L.!
3. *B. maxima*, L.!
4. *B. Eragrostis*. One specimen from Kalm, and one marked “Morison, Hist. 204, t. 6. f. 52,” are both *Poa Eragrostis*, L. One marked C. B. S. 384, is *Eragrostis Chapellieri*, Kunth.

B. virens, 2nd edit. p. 103, is merely a form of *B. media*. One specimen is marked by Linnæus “*B. anceps*.”

UNIOLA, *l. c.* p. 71.

1. *U. paniculata*, L. ! Pluk. t. 32. f. 6 is a good drawing.
 2. *U. spicata*, L. ! One from Kalm is *Poa Michauxii*, Kunth ; another, from Siberia, Pallas, is *Æluropus brevifolius*, Trin.
- U. bipinnata*, 2nd edit. p. 104, is *Poa (Eragrostis) cynosuroides*, Retz.
- U. mucronata*, *l. c.*, is not in the Herbarium.

DACTYLIS, *l. c.* p. 71.

1. *D. cynosuroides* is *Spartina cynosuroides*, Willd.
 2. *D. glomerata*, L. !
- D. ciliaris*, Mant. 185, from C. B. S., is *Lasiochloa ciliaris*, Kunth.
- D. lagopoides*, Mant. 33, is *Æluropus lavis*, Trin.
- Another, marked, but not by Linn., “*Dactylis paleacea*, 296,” is *Kæleria cristata*, Pers.

CYNOSURUS, *l. c.* p. 72.

1. *C. cristatus*, L. !
2. *C. echinatus*, L. !
3. *C. Lima* is *Wangenheimia disticha*, Mœnch.
4. *C. durus* is *Sclerochloa dura*, P. de B.
5. *C. cæruleus*. One specimen is *Sesleria cærulea*, Arduin ; the other is *S. sphærocephala*, Arduin.

6. *C. Ægyptiacus* is *Dactyloctenium Ægyptiacum*, Willd. There are one erect and one procumbent form of the same from Jamaica (Browne).
7. *C. Indicus* is *Eleusine Indica*, Gært. One specimen, sent from Browne.
8. *C. paniceus* is *Polypogon Monspeliensis*, Desf., omitted in 2nd edition.
9. *C. aureus* is *Lamarckia aurea*, Mœnch.
- C. virgatus*, Am. Acad. v. 393, from Jamaica (Browne), is *Leptochloa virgata*, P. de B.
- C. Coracanus*, Sp. Pl. 2nd ed. p. 106, is *Eleusine Coracana*, Gært.
- C. Uniolæ*, Linn. fil. Supp., is *Brizopyrum unioloïdes*, Nees; and this contains a small scrap of *Cynodon Dactylon*, Pers.

FESTUCA, *Sp. Pl.* 1st edit. p. 73.

1. *F. ovina*, L.! Correct, except one from Kalm, which is *F. tenella*, Willd. Another in the Herbarium, marked *F. varia*, Hall. 1439, is also *ovina*.
2. *F. duriuscula*, L.!
3. *F. rubra*, L. has very hairy spiculæ. Linn. in a MS. note says it is a variety of *duriuscula*. One pinned to it is marked by Linn. *F. dumetorum*, and is certainly only *rubra*.
4. *F. amethystina*. Not in Herb.
5. *F. Myurus*, L.! A very small dwarf state.
6. *F. maritima*. Not in Herb.
7. *F. bromoides*, L.! In my opinion, the same as No. 5.
8. *F. decumbens* is *Triodia decumbens*, P. de B.
9. *F. elatior*, L.! Another sheet of this is marked "*F. palustris*, No. 26."
10. *F. fluitans* is *Glyceria fluitans*, Br.
11. *F. cristata*, also marked by Linn. "*Poa cristata*," is *Kæleria phleoides*, Pers., also marked by Linn., on the back of the sheet, "*Alopecurus Monspeliensis*."
- F. reptatrix*, 2nd edit. Sp. Pl. p. 108, from Egypt, is *Diplachne fusca*, P. de B.
- F. fusca*, l. c. 109, is the same plant.
- F. calycina*, l. c. 110, is *Schismus marginatus*, P. de B. This is also marked "12. *F. barbata*."

F. decumbens, l. c. 110. Not in Herb.

F. serotina, l. c. 111. Not in Herb.

F. dumetorum, l. c. 109. Already mentioned under No. 3.

F. spadicea, L. ! Syst. Nat. 732.

F. phænicoides, Mant. 32. Not in Herb.

There is also a specimen of *F.* [*Vulpia*] *ciliata* not marked by Linn. ; also one of *Sclerochloa arenaria* ; another, marked “*F.* Hall. Hist. 1445,” is *Kæleria cristata* ; another, unnamed, is *Festuca borealis*, Mert. & Koch.

F. spinosa, Linn. fil. Supp. 111, is *Eragrostis spinosa*, Pers.

In this envelope, but why placed here I know not, is part of a plant marked “*Nardus spuria Gangitis*, Lobel.” It is the lower portion of the culm of *Andropogon laniger*, Desf., known in commerce as *Schænanthus*, &c.

BROMUS, *Sp. Pl.* 1st edit. p. 76.

1. *B. secalinus*, L. ! Pinned to it a specimen of *B. mollis*, marked “*B. hordeaceus*, No. 32.”
2. *B. squarrosus*, L. !
3. *B. purgans*, from Upsal Garden, is the same as No. 4.
4. *B. ciliatus*, L. ! From Kalm, and his seeds raised in Upsal Garden. One marked *B. ciliatus* by Smith is *B. rubens*.
5. *B. sterilis*, L. !
6. *B. arvensis*, L. ! marked by Smith “Cav. Ic. 590.”
7. *B. tectorum*, L. !
8. *B. hordeaceus*. Omitted in 2nd edition, and referred to *B. mollis*, which it is.
9. *B. giganteus*, from Arduin, is *Festuca gigantea*, Vill.
10. *B. pinnatus* is *Brachypodium pinnatum*, P. de B.
11. *B. cristatus* is *Triticum cristatum*, Schreb. In the MS. notes of 2nd edition it is transferred to *Triticum*.

B. mollis, L. ! 2nd edit. p. 112. One small specimen is marked “*B. nanus*, Weigel.”

B. Madritensis, L. ! Am. Acad. iv. 265. From Upsal Garden ; another specimen, marked “No. 35 *Bromus erectus*, R. Syn.,” is also this.

B. rubens, L. ! Am. Acad. iv. 265. From Spain.

B. scoparius, L. ! Am. Acad. l. c. The true plant from Spain ; another marked *scoparius* is *B. Japonicus*.

B. racemosus, L.! 2nd edit. Sp. Pl. p. 114. Linnæus has marked one specimen *B. secalinus*.

B. triflorus, l. c. p. 115. Not in Herb.

B. distachyos, Am. Acad. iv. 304, is *Trachynia distachya*, Link. One specimen is marked by Linn. as his *Secale bromoides*; and another, pinned to it, No. 36, from England, is *Brachypodium sylvaticum*.

B. inermis! Mant. 186, is in Herb.; but no specimen is so marked by Linnæus.

B. ramosus. There is much confusion, again, about this plant. The plant described in Mant. 34, sent from the East, and marked "Allioni, 2233, from Scheuchzer," is *Brachypodium ramosum*, R. et Schultes, the term *ramosus* being applicable to the stem. The only plant marked *ramosus* by Linn. is *Bromus asper* of Murray, sent by Schreber.

B. geniculatus, Mant. 33, is *Festuca (Vulpia) geniculata*, Willd.

B. rigens, Mant. 33, is a hairy-glumed state of *B. scoparius*, L.

B. stipoides, Mant. 557, is *F. (Vulpia) geniculata*, Willd.

There is also a specimen of *B. erectus*, Huds., marked "*B. agrestis*, Allioni." A specimen of *Brachypodium sylvaticum* is marked "*Bromus gracilis*, Weigel."

STIPA, *Sp. Pl.* 1st edit. p. 78.

1. *S. pennata*, L.!

2. *S. juncea*, L.! One is correct, and one specimen is *S. sparta*, Trin., with much smaller flowers.

3. *S. avenacea*, L.!" "Virg. Gron. 133." This is also marked "No. 3. *capillata*."

S. capillata, L.!" 2nd edit. p. 116. There is a specimen not named.

S. tenacissima, Am. Acad. iv. 266, is *Macrochloa tenacissima*, Kunth.

S. membranacea, 2nd edit. p. 116, is *Festuca (Vulpia) uniglumis*, Solander.

S. arguens, l. c. p. 117, is *Anthistiria ciliata*, Linn. fil.

S. Aristella; Syst. Nat. iii. 229, is *Aristella bromoides*, Bertol.

S. Spinifex, Mant. 34, is *Spinifex squarrosus*, Linn. fil.

S. spicata, Thunb. 378, is *Heteropogon hirtus*, Pers.

There is also a specimen of *Lasiagrostis Calamagrostis*, Link, without a name.

AVENA, l. c. p. 79.

1. *A. Sibirica*, from Gmelin, is *Stipa Sibirica*, Lam.

2. *A. elatior* is *Arrhenatherum avenaceum*, P. de B.
3. *A. Pennsylvanica*, from Kalm, is *Trisetum palustre* of Trinius and American authors.
4. *A. Læflingiana*, from Spain, is *Trisetum Læflingianum*, P. de B.
5. *A. sativa*, L. ! One specimen is marked by Linn. *A. ponderosa*.
6. *A. fatua*, L. ! One sheet marked 6 is *A. barbata*, Brot.
7. *A. flavescens* is *Trisetum flavescens*, P. de B. Pinned to it a specimen of *A. pratensis*.
8. *A. fragilis* is *Gaudinia fragilis*, P. de B.
9. *A. pratensis*, L. ! Some specimens are also marked "*spicata*," which they are not.
10. *A. spicata*, from Kalm, is *Danthonia spicata*, N. et Sch., also marked "*bromoides*."

A. nuda, Am. Acad. iii. 401, is an unnamed state of *A. sativa*.

A. sterilis, L. ! 2nd edit. Sp. Pl. p. 118, is probably only a form of *A. fatua*. One pinned to it, also marked *A. sterilis*, is *Macrochloa arenaria*, Kunth.

A. sesquitertia, Mant. 33. No specimen in Herb.

A. pubescens, L. ! 2nd edit. Sp. Pl. 1665, is only a form of *A. pratensis*, as Linnæus in a MS. note suggests : he has also marked it "*Avena* near *sesquitertia*."

A. stipiformis, Mant. 34. Not in Herb.

A. patula, Hall. Hist. 1489, from Dick, is a small state of *A. pratensis*.

A. bromoides, Sp. Pl. 1666, is *A. pratensis*, L.

A. hispida, Thunb., is *Tristachya leucothrix*, N. ab E.

There are four species of *Danthonia* from C. B. S. without names, but probably sent by Thunberg. The same envelope contains a specimen of *Andropogon Schænanthus*, a scrap of *Diectomis fastigiata*, and of *Bromus squarrosus*.

LAGURUS, *Sp. Pl.* 1st edit. p. 81.

1. *L. ovatus*, L. !

L. cylindricus, 2nd ed. p. 120, is the large European form of *Imperata arundinacea*, Cyrill.

ARUNDO, *l. c.* p. 81.

1. *A. Bambos* is *Bambusa arundinacea*, Willd. The leaves attached are small, and the stipules spinous.

2. *A. Donax*, L.! Both specimens are marked "Kl.," which, I suppose, indicates Klein. One is real *A. Donax*; the other is *Phragmites communis*, Trin.
3. *A. Phragmites*, from Browne and from Ind. or., are *Phragmites communis*, Trin. A much expanded state is marked "*Phrag. arundinacea*, Allam. Ep. ad Linn. 1770."
4. *A. epigejos*. The first marked by Linn. "*epigejos*" is *Phragmites*. Pinned to it are specimens of *Deyeuxia montana*, Poir., one marked on the back "*A. montana*, Fl. Suec.;" and one is *Calamagrostis lanceolata*, Roth.
5. *A. Calamagrostis* is *Calamagrostis epigejos*, Roth. Awn basal, with hairs longer than the flower. Another marked "*A. Calamagrostis*" is *Lasiagrostis Calamagrostis*, Link.
6. *A. arenaria* is *Ammophila arundinacea*, Host.

ARISTIDA, *Sp. Pl.* 1st ed. p. 82.

1. *A. Adscensionis*, L.! Linn. remarks that this is one out of four plants which constitute the flora of the Island of Ascension, the others being *Sherardia fruticosa*, *Euphorbia origanoides*, and *Portulaca*.
- A. Americana*, L.! Am. Acad. v. 393. From Jamaica, Browne. This is called *A. dispersa* by Trin.; but Linnæus's name ought to take precedence. Kunth has misplaced the Linnean synonym in *Eutriana juncifolia*.
- A. plumosa*, L.! 2nd edit. *Sp. Pl.* p. 1666, from Armenia, is *Aris. (Stipagrostis) plumosa*.
- A. arundinacea*, Mant. p. 186, from Koenig, is *Arundo Madagascariensis*, Kunth.

There is a specimen of *Aristida Hystrix*, from Thunb., and another, marked No. 47, var. β , is *A. vestita*, Thunb.

LOLIUM, *Sp. Pl.* 1st ed. p. 83.

1. *L. perenne*, L.!
 2. *L. temulentum*, L.!
- L. tenue*, 2nd ed. *Sp. Pl.* 122, is merely a form of *L. perenne*.
- L. distachyon*, Mant. p. 186, from Koenig, is *Digitaria ciliaris*, Pers.

ELYMUS, *Sp. Pl.* 1st ed. p. 83.

Linnæus has not attached his usual mark to the five following as being in his Herbarium; but they are all present:—

1. *E. arenarius*, L.!
2. *E. Sibiricus*, L.!
3. *E. Canadensis*, L.!

4. *E. Virginicus*, L.!

5. *E. Caput Medusæ*, L.!

E. Philadelphicus, Am. Acad. iv. 266, from Canada, is the same as No 3 (*E. Canadensis*).

E. Hystrix, L.! Sp. Pl. 2nd ed. p. 124. From Gronovius.

E. caninus, Fl. Suec., 2nd ed. Sp. Pl. p. 124. Two specimens marked "B and 37," from England, are *Triticum caninum*, Schrad. One marked "Gmelin 23" is *Trit. repens*; another marked "Gm. 25" is *Elymus Sibiricus*.

E. Europæus, L.! Mant. 35.

SECALE, *Sp. Pl.* 1st ed. p. 84.

1. *S. cereale*, L.!

2. *S. villosum*. Not in Herb.

3. *S. orientale*. Not in Herb.

4. *S. creticum*. One was originally so marked by Linn., but was scratched through. It is *Triticum villosum*, P. de B.

HORDEUM, *Sp. Pl.* 1st ed. p. 84.

1. *H. vulgare*, L.!

2. *H. hexastichon*. Not in Herb.

3. *H. distichon*. Not in Herb.

4. *H. Zeocriton*, L.! Awn of the central spicula 4-5 inches.

5. *H. murinum*, L.! Intermediate glumes sometimes fringed.

6. *H. jubatum*, L.! From Kalm.

H. bulbosum, Am. Acad. iv. 304. Has a very remarkable bulbous stem; but I believe it to be only a variety of *H. murinum*.

H. nodosum, 2nd edit. Sp. Pl. p. 126, is certainly *H. pratense*, Huds., of which there are also two other specimens without any name, and the species does not seem to have been taken up by Linnæus.

A plant marked 101 is *Secale cereale*, L.

TRITICUM, *Sp. Pl.* 1st ed. p. 85.

1. *T. æstivum*. Not in Herb.

2. *T. hybernum*. Not in Herb.

3. *T. turgidum*, L.! is ordinarily cultivated wheat, included in *T. vulgare*, Vill.

4. *T. Spelta*, L. ! The specimen of this is marked 4, and is *Spelta*, but it is also marked by Linn. "*T. hybernum*."

5. *T. monococcum*, L. !

6. *T. repens*, L. !

7. *T. caninum*, L. ! A small specimen is present, but not marked. In the 2nd edition the plant is removed to *Elymus*.

T. Polonicum, L. ! 2nd edition, p. 127.

T. tenellum, *l.c.* 127, is *Brachypodium Poa*, R. et Sch., with three nerves to the glumes.

T. junceum, L. ! Am. Acad. iv. 266.

T. maritimum, 2nd edit. p. 128, is *Sclerochloa dichotoma*, Link. Another marked "*Poa maritima*" by Linn., "*T. loliacum*" by Sm., and "*Festuca maritima*, No. 69," is *Brachypodium Poa*.

T. unilaterale, Mant. 35. This is also marked "*Nardurus 6*" by Linn. and by Smith "*T. subulatum*" and "*T. Hispanicum*." I believe them all to be forms of *T. tenellum* mentioned above.

T. prostratum, Linn. fil. Supp. 114, from Pallas, is also in the Herbarium.

ORYZA, *Sp. Pl.* 1st ed. p. 333.

1. *O. sativa*, L. !

ZEA, *Sp. Pl.* 1st ed. p. 971.

1. *Zea Mays*, L. ! One male specimen and one female of the peculiar form called *Macleatum*; glumes much elongated.

COIX, *Sp. Pl.* 1st ed. p. 972.

1. *C. Lachryma Jobi*, L. !

TRIPSACUM. Not in 1st edit.; in 2nd edit., p. 1378.

T. dactyloides, L. ! From the Upsal Garden.

OLYRA. Not in 1st edit.; in 2nd edit., p. 1379, from Am. Acad. v. 408.

O. latifolia, Linn.

ZIZANIA, *Sp. Pl.* 1st edit. p. 991.

1. *Z. aquatica*, L. ! The plant so named is the small state which I believe Linnæus, in his Mant. p. 295, intended to indicate by *palustris*,

of which form there is also a specimen from Upsal Garden, marked "*palustris*" by Sm. *Z. aquatica* would then be Sloane's plant 110, t. 67; and the large species what is called "*Tuscanina*" in North America, of which there is a good specimen in the Herbarium marked, but not by Linn., *Z. effusa*.

2. *Z. palustris* is taken up from Rheede; but there is no specimen in the Herbarium.

SPINIFEX, *Sp. Pl.* Not in 1st or 2nd edit.: first described in Mantissa, p. 300.

S. squamosus, L.! male and female specimens.

PHARUS. Not in 1st edit.; 2nd edit., p. 1408.

P. latifolius, L.! Am. Acad. v. 409. From Jamaica.

ANDROPOGON, *Sp. Pl.* 1st edit. p. 1045.

1. *A. contortum*, described from India. Not in Herb.
2. *A. divaricatum*, L.! from Virginia, Gron. 135, is *Androp. ternatus*, Nees, which name must give precedence to Linnæus's.
3. *A. nutans*, L.! From Jamaica, and also Virginia, Kalm, marked "*Lagurus*, Clayton, 600."
4. *A. alopecuroides*, from North America, is *Erianthus saccharoides*, Mich.
5. *A. distachyon* is *Apocopis Wightii*, Nees ab Esenb. Smith has written "Ask Thunberg if this be Burser's plant?" I suppose this has misled others, and hence a very different plant from Linnæus's original specimen is now called *Androp. distachyus*.
6. *A. Schænanthus*, L.! From India and Arabia. This is the plant generally called "*A. Martini*," Roxb., "*A. pachnodes*," Trin., and many other names. It is quite distinct from Wallich's *A. Schænanthus*. Linnæus's specimen is remarkably well figured by Ventenat, Cels. t. 89.
7. *A. Virginicum*, L.! From America.
8. *A. bicorne*, L.! From Brazil and Jamaica.
9. *A. hirtum*, L.! From Sicily, Smyrna, and Lusitania.
10. *A. Nardus*, L.! Described in Fl. Zey. 45, as *Lagurus*, and the plant there described is to be found in Hermann's Herb. vol. ii. 66.
11. *A. Ischæmum* is not the plant generally considered *A. Ischæmum*, but is *Andropogon provincialis*, Lam., a plant that I have rarely seen.

12. *A. fasciculatum*. Contains two species. One is *Eleusine Indica*, Gærtn., and the other is *Pollinia ciliata*, Trin. The reference to Sloane, t. 69, p. 2, is incorrect, as that is *Paspalum fasciculatum*.
- A. caricosum*, L.! 2nd edit. Sp. Pl. p. 1480, is *Androp. serratus*, Retz, which name must give place to Linnæus's.
- A. Gryllus*, Am. Acad. iv. 332, from South Europe, is *Chrysopogon Gryllus*, Trin.
- A. insulare*, l. c. v. 412, is *Panicum leucophæum*, H. B. K.
- A. Ravennæ*, 2nd edit. p. 1481, is *Erianthus Ravennæ*, P. de B.
- A. muticum*, l. c. 1482, described from C. B. S., is not in Herb.
- A. polydactylon*, Am. Acad. v. 412, from Jamaica, is *Chloris polydactyla*, Sw.
- A. quadrivalvis*, Mant. 303, printed in the margin, by mistake, "nutans," is *Anthistiria ciliata*, Retz.
- A. cymbarium*, L. ! Mant. 303, is the beautiful species of *Cymbopogon* which Sprengel calls *C. elegans*. Sent by Koenig from Ind. or.
- A. prostratum*, Mant. 304, is *Anthistiria prostrata*, Willd.
- A. barbatum*, Mant. 302, described from India, is *Chloris barbata*, Sw.
- A. scabrum*, Linn. Herb. ! from Koenig, is *Chamæraphis hordeucea*, R. Br.
- A plant from Feuillée, is *Androp. Xanthoblepharis*, Trin. Icon. ; and there is also another of *Schisachyrium brevifolium* from the same person.

HOLCUS, *Sp. Pl.* 1st edit. p. 1047.

1. *H. Sorghum* is *Sorghum vulgare*, Pers.
2. *H. saccharatus* is not in Herb.
3. *H. halepensis*, from Upsal Garden, is *Sorghum halepense*, Pers., awned and unawned.
4. *H. lanatus*, L. !
5. *H. odoratus*. One specimen is *Hierochloë borealis*, R. et Sch. ; the other is *Hier. australis*.
6. *H. laxus*, from Virginia, is *Uniola gracilis*, Michx.
7. *H. striatus*, Gron. Virg. 135, is *Panicum gibbum*, Elliot.
- H. spicatus*, Sp. Pl. ed. 2. p. 1483, is *Penicillaria spicata*, Willd. This is also marked "*Alopecurus Indicus*" by Sm.
- H. mollis*, L. ! 2nd edit. p. 1485.

H. latifolius, l. c. 1486, from Asia, Osbeck, is *Centotheca lappacea*, Desv. This is also marked "*Cenchrus lappaceus* and *Bambu Ramp.*"

H. bicolor, Mant. 301, from Persia, is a form of *Sorghum vulgare*. Pers.

H. pertusus, Mant. 301, is *Andropogon pertusus*, Willd.

H. serratus, Linn. Herb., is *Panicum serratum*, R. Br.

APLUDA, *Sp. Pl.* 1st edit. p. 82.

There is much confusion about this genus. The species which appears in 1st edition is first described in 2nd edition *Gen. Pl.* (1742) as No. 1018, *Ischæmum*, from Scheuchz., and this is the plant described in 5th edition of *Gen. Pl.* (1754). The plant described in the 6th edition is *Zeugites* in the 8th edition, Schreber's (1789): it is the first *Apluda*; and hence I suppose P. de B. has called ordinary *Apluda*, *Calamina*.

1. *A. mutica*, L.!

A. aristata, L.! *Am. Acad.* iv. 303. This is also to be found in *Herb. Pluk.* i. 188. On one page there is a plant of *Anthistiria prostrata*, Willd.

A. Zeugites, *Am. Acad.* (1759) v. 412, figured by Browne as *Zeugites* (in 1755), is *Zeugites Americana*, Willd.

A. digitata, Linn. *fl. Supp.* 434, is *Polytoca bracteata*. Bennett in *Pl. Jav. rar.*

MANISURIS. Not in 1st or 2nd edit. *Sp. Pl.* Just appears in *Mantissa*, 300.

M. Myurus, L.! Marked by Koenig "*Ægilops sanguinea*," and by Linnæus as "*Ischæmum Myurus*." Is sometimes called *Peltophorus Myurus*, Nees.

ISCHÆMUM, *Sp. Pl.* 1st edit. p. 1049.

1. *I. muticum*, L.!

2. *I. aristatum*, L.! is what is generally called *I. barbatum*. One specimen is *Spodiopogon obliquivalvis*, Nees.

There is one spicula of *I. rugosum*, marked "*Cicadaria*," from Koenig; and by Smith, "*Ischæmum rugosum*, *Salisbury Ic. t. 1.*"

Ischæmum murinum from Forst., not in Linnæus's handwriting, is *Spodiopogon aureus*, Hook. et Arn. in *Bot. of Beechey's Voyage*.

There is also a single specimen of *Erianthus aureus*, P. de B., without name or locality; and a plant marked "*Isch. aculeatum*," which is *Ceytosis aculeata*, Willd.

CENCHRUS, 1st edit. *Sp. Pl.* p. 1049.

1. *C. racemosus* is *Lappago racemosa*, Willd.
2. *C. capitatus* is *Echinaria capitata*, Desf.
3. *C. echinatus*, L. ! with rather a long spike.
4. *C. tribuloides*, L. ! Sent by Kalm from Virginia.
5. *C. frutescens*. Not in Herb.

C. lappaceus, 2nd edit. p. 1488, is not in Herb., and the word is erased by Linnæus in a MS. note.

C. muricatus, Mant. 302. from Koenig, is *Trachys mucronata*, Pers. This is also named "*C. tripsaceus*" and "*Tripsacum distachyon*."

C. ciliaris, Mant. 302. One from Upsal Garden, and one from C. B. S. ; are both *Pennisetum cenchroides*, Richd.

C. granularis, Mant. 575, is *Manisuris granularis*, Sw.

ÆGILOPS, *Sp. Pl.* 1st edit. p. 1050.

1. *Æ. ovata*, L. !
2. *Æ. caudata*, L. !
3. *Æ. squarrosa*. Not in Herb.
4. *Æ. triuncialis*, L. !
5. *Æ. incurvata* is *Lepturus incurvatus*, Trin.

Æ. exaltata, Mant. 575, from Koenig, is *Ophiurus corymbosus*, Gærtu.

ROTTBELLIA is a genus of Linn. fil., first published in 'Nova Graminum Genera' (1779). The Herbarium contains

R. incurvata, which is *Lepturus incurvatus* ;

R. compressa, Linn. fil. Suppl. 114, which is *Hæmarthria compressa*, R. Br. ;

R. dimidiata, Linn. fil. Suppl. 114, which is *Stenotaphrum Americanum*, Schrank ;

R. exaltata, Linn. fil. ! l. c. 114. ; and

R. corymbosa, Linn. fil. l. c. 114, which is *Ophiurus corymbosus*, Gærtu.

Notes on *Caryophylleæ*, *Portulacææ*, and some allied Orders.

By GEORGE BENTHAM, Esq., Pres. L.S.

[Read June 6, 1861.]

THE series of orders in which natural affinities are the most discovered by the Candollean arrangement is undoubtedly that of

the Curvembryonous group, of which each one appears to be connected with the others by gradations so close that positive limits have very seldom been assigned to any of them, and yet they are necessarily dispersed in the three great classes of Thalamifloræ, Calycifloræ, and Monochlamydæ. Thus we find in the 'Prodrômus' that the numerous genera constituting the group are distributed among ten orders:—Caryophylleæ, referred to Thalamifloræ; Paronychiaceæ, Portulaceæ, and Ficoideæ, to Calycifloræ; and Phytolaccaceæ, Salsolaceæ (Chenopodiæ), Basellaceæ, Amarantaceæ, Polygonaceæ and Nyctagineæ, to Monochlamydæ. In this arrangement De Candolle appears to have been sometimes guided by the characters shown in what had been considered as the *typical* genus of each order. But the so-called typical genus of an order, as I believe I have already had occasion to point out to the Society, has not been always the one exemplifying in the most striking degree the characters prevailing in the majority of its co-ordinates, but, on the contrary, has often been remarkably exceptional, having been selected to give its name to the order from being the earliest or the most familiarly known to European botanists. Thus in Portulaceæ, for instance, the supposed typical genus *Portulaca*, having a semi-inferior ovary, determined the position of the order among Calycifloræ. It is, however, in that respect a remarkable exception in the order, all the rest of which (as it is usually limited) is essentially hypogynous. Some Caryophylleous genera are also more perigynous than several of those included by De Candolle in the supposed perigynous order Paronychiaceæ.

To remedy these and similar incongruities, several transpositions have been suggested by those who adhere generally to the Candollean classes. Thus, Asa Gray reduces Paronychiaceæ to a sub-order of Caryophylleæ, and removes also Portulaceæ next to them among Thalamifloræ. Harvey and Sonder bring Phytolaccaceæ also up to Thalamifloræ, but leave Portulaceæ and Ficoideæ in Calycifloræ. Lindley rejecting the distinction between Apetalæ and Polypetalæ, has two hypogynous alliances—*Silinales*, consisting of Caryophyllaceæ, Illecebraceæ, Portulaceæ and Polygonaceæ, and *Chenopodales*, consisting of Nyctaginaceæ, Phytolaccaceæ, Amarantaceæ and Chenopodiaceæ; and one perigynous alliance, *Ficoidales*, composed of Basellaceæ, Mesembryaceæ, Tetragoniaceæ and Scleranthaceæ. Endlicher, on the other hand, rejecting the character derived from staminal insertion, but maintaining that founded on the presence or absence of petals, places Mesembryaceæ, Por-

tulaceæ, Caryophyllaceæ and Phytolaccaceæ in one cohort among his Dialypetalæ, and Chenopodiaceæ, Amarantaceæ, Polygonæ and Nyctaginaceæ in another cohort far away among Apetalæ. All, however, are ready to suggest that in a really natural system all the above orders ought to be brought together, which cannot be done without entirely rejecting the above-mentioned great Candollean classes; yet no substitute has been proposed for these classes, except a vain endeavour so to modify the linear series as to bring allied orders into close approximation. Thus Grisebach, one of the most able advocates for this arrangement (which, with any one for whose views we had less respect, we should be tempted to call a disarrangement), brings indeed all our Curvembryonous orders together, but places them between Euphorbiaceæ and Malvaceæ, which in our view have quite as much right to be placed in close proximity as Caryophylleæ and Chenopodieæ*.

In considering how to deal with these various proposals, we must observe that none of the classes, groups, or alliances so formed are limited by any character that does not undergo many exceptions among the genera placed under them; nor are we able to devise any other that shall be thus strictly and absolutely defined. Even the curvature of the embryo round a farinaceous albumen, the chief character of the whole group, can scarcely be traced in *Dianthus*, in some *Polycarpææ*, in *Anacampteros* and its allies, in some *Polygonææ*, &c.; and the position of the leaves, the presence or absence of stipules and petals, the number and insertion of the stamens, the relative position of sepals, petals, stamens and carpels, the degree of combination or reduction of the carpels and ovules, are characters so variously combined or dissevered, as always to leave small anomalous genera invalidating or uniting any groups we can form. Our object has therefore been to seek out such limitations as may bring together genera having the greatest general resemblance, and united by such tangible characters as should have the fewest exceptions.

Our first great group is that of the CARYOPHYLLEÆ, the normal characters of which (besides those common to all the above orders) are opposite leaves; sepals, petals, and one or usually two series of stamens, all isomerous; a free one-celled ovary with several ovules in the centre, and formed by the combination of two or more car-

* When in this and other similar papers I make use of the plural *we*, with reference to any general views on the principles of distribution and limitation of genera, I refer to those of Dr. Hooker and myself as adopted for the 'Genera Plantarum' we are preparing.

pels; and a dehiscent or several-seeded fruit. The opposition of the leaves has no exception; the sepals are never reduced, nor the petals increased in number, although the latter are often very much reduced in size, and in a few species totally deficient; the stamens of either series are never increased in number, but occasionally irregularly reduced, or one or the other series deficient; the ovary, if ever divided into cells, is only so at the very base or at a very early stage; the carpels are always closely combined, and in some genera the styles also; both are often reduced in number below that of the other parts of the flower, but never increased, and never reduced to one simple one; and there is only one species where the ovules are reduced to a single one. In the great majority of species the petals and stamens are hypogynous, and if, in a few others, the disk which bears them is perigynous, it is only slightly so; and we therefore concur with other botanists in placing the order among Thalamifloræ. We estimate the total number of good species of Caryophylleæ at about 800, and we distribute them into three tribes: 1. *SILENEÆ*, with a gamosepalous calyx and free styles; in these the stamens are always hypogynous, and there are no stipules; 2. *ALSINEÆ*, with free sepals and free styles; in them the stamens are hypogynous or slightly perigynous, and scarios stipules are present only in about half-a-dozen species (*Spergula* and *Spergularia*); and 3. *POLYCARPÆÆ*, with free sepals and combined styles. The stamens are, as in *Alsineæ*, hypogynous or slightly perigynous, and the stipules are most frequently, or perhaps always, present.

Our next order is that of the *PORTULACEÆ*, which, with the ovary of Caryophylleæ, is at once distinguished by the remarkable anisomery of the parts of the flower. The sepals are usually 2 only, with petals varying from 3 to 7 or 8; in one species only (*Lewisia*) the sepals are 5 or 6, with 8 to 10 petals. In no case are the petals deficient. The stamens are most frequently more numerous than the petals, and where equal to them in number, or fewer (sometimes only one), they are always opposite to them and adhering to their base. It was this remarkable divergence from the ordinary arrangement of the stamina in the group of orders we are considering, that induced Fenzl to extend the *Portulacææ* so as to include all genera where a tendency to a similar arrangement may have been traced or supposed. But whilst we do full justice to the accuracy of Dr. Fenzl's observations on the whole of the curvembryonous orders which he has investigated with so much detail, we cannot concur in the general views he has taken of their

delimitation, which, indeed, have not met with general adoption. The disturbance of the ordinary alternation in the different whorls composing the flower is curious in several Caryophylleæ, without our being able to detect any cause or to trace any connexion with other characters: thus the styles are opposite the sepals in *Cerastium*, alternate with them in *Sagina*, and when exceptionally pentagynous, as in *S. aquatica*, in *Stellaria*. The stamens, when reduced to 5, are usually opposite the sepals, but alternate with them in *Colobanthus*, without however being epipetalous or accompanied by any other of the characters of Portulaceæ; and, again, in *Schiedea*, so nearly allied in most respects to *Stellaria*, and having both series of stamens present in their usual position, the petals are opposite the sepals, which does not occur in any other genus of the Curvembryonous group. It has been endeavoured to explain this circumstance by calling the petals staminodia or sterile filaments; but that does not remove the difficulty; for when staminodia do exist in any allied order, they are not, any more than petals, placed as in *Schiedea*.

The Portulaceæ, as we should continue to limit them, have been generally recognized as a natural group. They are more or less succulent. The leaves are alternate or occasionally opposite, but never perhaps so strictly so as in Caryophylleæ; the petals either very fugacious or shrinking very soon into a withered mass, which makes it very difficult in some of the minute-flowered species to ascertain their number or shape from dried specimens. All genera, except *Portulaca* itself, are essentially hypogynous; and in *Portulaca*, where the ovary is half-inferior, the ring bearing the petals and stamens is as closely connected with the ovary as with the calyx; so that if, as has been suggested, the adherent base of the flower be considered as an enlarged concave torus or summit of the pedicel, the insertion of the petals in *Portulaca* may be said to be less truly perigynous than in those Alsineæ where they proceed from a disk lining the base of the calyx and free from the ovary. We therefore have no hesitation in following A. Gray and others, who rank Portulaceæ among Thalamifloræ. The ovary in *Portulacaria* is uniovulate, and becomes an indehiscent 3-winged nest; and in *Silvæa* the fruit is a 1-seeded utricle; but in both genera the flowers are too decidedly Portulaceous to remove them from the family.

The Tetragonieæ and Sesuvieæ, united by Fenzl with Portulaceæ, differ both from them and from Caryophylleæ in their ovary divided into cells, and in their very perigynous stamens.

We would propose to restore them to FICOIDEÆ, where they were placed by De Candolle and others, and from which they chiefly differ in the absence of petals. As they belong most decidedly to Calycifloræ, which we have not as yet worked up in detail, I shall defer for the present any further observations on the genera they consist of.

The MOLLUGINEÆ, also included by Fenzl among Portulacæ, have been referred by some to Paronychiacæ on account of their stipules, by others to Caryophylleæ for their capsular fruit. They form a small group, however, which cannot well be attached to either of the allied larger orders without in some measure invalidating their characters. From Caryophylleæ they differ in their alternate stem-leaves (often apparently verticillate, but never really so, nor yet opposite, although the bracts may be so in a few cases), and in their septate ovary and capsule; from Portulacæ in their isomerous calyx, septate ovary, usual want of petals, and habit; from Ficoideæ in habit and in their stamens usually hypogynous or nearly so; from Phytolaccacæ, Paronychiacæ, and other Monochlamydeous orders in the several-seeded cells of their ovary and fruit. They are all apetalous, except *Macarthuria*, *Telephium*, and occasionally *Glinus*, and do not well come in either with Thalamifloræ or Calycifloræ. We think they might be best placed amongst Monochlamydæ next to Phytolaccacæ, or even incorporated in that order as a tribe, bearing in some measure a relation to the true Phytolaccacæ similar to that which Celosieæ do to the remaining Amarantacæ.

The PARONYCHIACÆ form the link which unites Caryophylleæ with Amarantacæ. They were formerly distinguished from Caryophylleæ by the supposed constantly perigynous insertion of the stamens; but this character proving in many instances fallacious, it has been proposed to take the presence of stipules as the ordinal distinction. That, again, separated *Spergula* and *Spergularia* from the closely allied Alsineæ; and Fenzl, A. Gray, and others unite the whole with Caryophylleæ. It appears to me, however, that if we limit Paronychiacæ to the genera with a uniovulate (although compound) ovary and utricular fruit, we have a distinct group, more nearly allied to Amarantacæ than to Caryophylleæ, and which, as all except *Corrigiola* are decidedly apetalous, would take its place among Monochlamydæ.

With regard to PHYTOLACCACÆ, characterized by the ovary consisting of one or usually several annular uniovulate carpels, and to CHENOPODIACÆ and AMARANTACÆ, with their vague but

universally recognized ordinal distinctions; we leave them for the present as elaborately worked up in the 'Prodromus,' entering only our provisional protest against the useless change in name from Chenopodiaceæ to Salsolaceæ, against the separation of Basellaceæ as an order, against the importance attached to the erect or horizontal seeds, and against much superfluous splitting both of genera and of species upon inconstant characters.

The four orders, either retained among Thalamifloræ or now first transferred to Monochlamydæ, call however for some observations as to the limits of genera which I shall now severally enumerate.

I. CARYOPHYLLÆ.

The limits of most of the large genera of this order have always been very artificial, and were made to rest by Linnæus chiefly on the number of parts of the flower. As these have been shown to be in some cases very variable, and often quite unconnected with habit or other characters, A. Braun, Fenzl, and others have resorted to the embryo, the venation of the calyx, the dehiscence of the capsule, &c.; and the latter character has been especially relied upon by Fenzl, who has alone investigated specifically the whole order, and worked out a large portion of it with the greatest accuracy of detail. He has not, indeed, been always successful in the new combinations he has formed to replace the old Linnean genera; his distinction between *Arenaria* and *Alsine*, for instance, is not a natural one; but, on the other hand, he has much improved the circumscription of some genera, such as *Gypsophila*, *Cerastium*, &c., and contributed very largely to our accurate knowledge of the various forms assumed by the numerous species, races, and varieties of the order. In determining the limits to be assigned to our genera, we have always found we could place implicit reliance on the characters assigned by him to the species he examined, as well as on those given by A. Braun, J. Gay, and M. Willkomm, who have specially studied portions of the order.

Of the three above-mentioned tribes of Caryophyllæ, the first, SILENEÆ, has been universally recognized as distinctly marked out by the gamosepalous calyx, and has even been raised by many modern botanists to the rank of an independent order. We continue it as a tribe only, and we still think that the large genera of the older botanists, with some slight modifications founded on the capsule, the embryo, or on the venation of the calyx, are as

natural as any that have been subsequently proposed. We purpose adopting the following eleven.

* *Semina peltata, hilo faciali. Embryo rectus.*

1. *Velezia*, Linn. 2. *Dianthus*, Linn. 3. *Tunica*, Scop.

** *Hilum marginale. Embryo periphericus.*

4. *Acanthophyllum*, C. A. Mey. 5. *Drypis*, Linn. 6. *Gypsophila*, Linn.
7. *Saponaria*, Linn. 8. *Silene*, Linn. 9. *Cucubalus*, Linn. (ex parte).
10. *Lychnis*, Linn. 11. *Wibelinia*, Hochst.

Dianthus is the most natural and best-defined genus of the whole order. The calyx is peculiar, never angular, but marked by numerous equal parallel ribs—7, 9, or 11 to each sepal, or 35, 45, or 55 in the whole, and is always surrounded at the base by one or more pairs of bracts. Ten stamens, two styles, a capsule opening at the top by 4 teeth or short valves, and seeds much flattened, attached by their inner face, with a straight embryo, complete the distinctive characters, to which we believe there are no exceptions. The species are numerous, but have been enormously multiplied in books, being particularly liable to variation in their bracts, in their showy petals, in the density of the inflorescence, &c. They are moreover said to hybridize in a wild state with the greatest facility; but this is a point which requires much further unprejudiced observation.

Tunica is a group of about 10 species which have been variously distributed in *Dianthus* and *Gypsophila*, or separated into one, two, or three genera. They have the seeds, and in most cases the bracts, of *Dianthus*; but the calyx has either only 5 nerves, as in *Gypsophila*, or at most 2 lateral ones to each sepal, or 15 in the whole. Most of the species, on account of their short calyx and small bracts, were included by Linnæus in *Gypsophila*; one species, however (now often broken up into three), with a long calyx completely enveloped in scarious bracts, was included by him in *Dianthus* (*D. prolifer*, L.), and constitutes the genus *Kohlrauschia* of Kunth. As a solitary species we think it more convenient to retain it in *Tunica*, as there are no very positive characters to separate it. Again, in Fenzl's section *Pseudotunica*, raised by Reichenbach to the rank of a genus under the name of *Fiedlera*, there are no outer bracts, but all the other characters are those of the true *Tunicas*.

Velezia, very near *Tunica* in technical characters, may nevertheless be maintained as an old-established genus, to which the very slender calyx and rigid habit give a peculiar aspect. The

Linnean character of 5 instead of 10 stamens is said not to be quite constant; but I have always found 5 only in the few specimens I have examined.

Acanthophyllum and *Drypis*, with a general affinity to *Saponaria*, are closely connected with each other in their prickly foliage, bracts and calyx-teeth, in their ovary and fruit. The ovules are few; and of these few, seldom more than one attains maturity. The capsule has been described as circumsciss, but in most cases that dehiscence has appeared to me to have arisen from the manner in which the specimens had been dried. In many *Sileneæ* the upper portion of the capsule assumes a more cartilaginous and stiffer consistence than the lower part; in these two genera it is particularly thick, and opens in valves only very late or not at all, whilst the lower portion, especially if gathered before it is quite ripe, remains thin and herbaceous, so as to break from it with very little force, but I have never seen the upper portion fall off naturally. The characters by which the two genera are distinguished are more artificial. *Acanthophyllum*, containing about a dozen species, has a 5-angled or 5-ribbed calyx, either without any lateral nerves, or one faint one to each sepal, on each side of the midrib; the stamens are usually 10, and the styles 2. In *Drypis*, still limited to the old Linnean species, the calyx has many ribs, with those of adjoining sepals usually free from each other as in *Diantheæ*, not united as in *Silene* and *Lychnis*; the stamens are usually 5, and the styles 3, although I have not unfrequently observed 2 or 5 styles. *Jordania* of Boissier appears to have the general characters of *Acanthophyllum*, without sufficient difference in habit to maintain it as a distinct genus on account of the capsule more readily splitting into 4 valves.

Gypsophila and *Saponaria*, again, are too closely blended with each other to suffer any positive line of distinction to be drawn between them, a few of the smaller-flowered species being almost equally referable to the one or to the other; yet, as old-established and rather numerous groups with a great majority of well-characterized species, they may still be maintained as separate genera. With the seeds, the 10 stamens, and other general characters of *Silene* and *Lychnis*, they are readily known by the calyx, in which the lateral nerves of adjoining sepals, if present, never amalgamate, and by the styles, which are almost if not quite always two only. They differ from each other chiefly in the calyx, which in *Gypsophila* is usually turbinate or campanulate, not contracted at the top, with 5 usually broad nerves, and is more or less membranous

and veinless between them, whilst in *Saponaria* it is tubular or pyramidal or slightly contracted at the top, and, in most cases, even the midrib of each sepal is scarcely conspicuous. In *Gypsophila*, moreover, the capsule opens much more deeply into 4 valves than in *Saponaria*, which has usually only 4 short teeth.

Among the small genera proposed by various authors which we do not consider sufficiently distinct to adopt, *Banffya*, Baumg., and *Dichoglottis*, Fisch. and Mey., are chiefly distinguished by inflorescence; *Heterochroa*, Bunge (*Acosmia*, Benth. in Wall. Cat.), by the more deeply cleft calyx; and *Ankyropetalum*, Fenzl, by the rigid habit and small narrow calyx, which bring it very near to the small-flowered *Saponarias*. *Vaccaria*, Medik., a single widespread cornfield weed, appears to have been better placed by Linnæus in *Saponaria*, than by more modern botanists in *Gypsophila*.

The two large genera *Silene* and *Lychnis* are distinguished from all the preceding ones, except the single species of *Drypis*, by the styles, which are universally (except perhaps in very rare anomalous flowers) more than two, and by the calyx, which, in all but the very few conical *Silenes*, has ten more or less prominent nerves, the two lateral ones of adjoining sepals being constantly blended into one. But the limits between the two genera are less natural and less accurately defined. The Linnean character of 3 styles in *Silene*, and 5 or rarely 4 in *Lychnis*, although not quite constant, is perhaps even now the best that has been proposed, and the very few species where these numbers are slightly variable must be referred to that genus with which the great majority of their flowers agree.

With regard to their subdivision, many natural groups have been formed, which, especially in the case of *Lychnis*, have been frequently raised to the rank of genera. But the most marked are generally single species; and others, if tolerably defined in one genus, have their corresponding forms in the other, passing gradually into different groups. We therefore cannot at present see any course more in conformity to our general principle than to qualify the greater number of them as more or less artificial sections only of two artificial but large genera. I shall proceed to enumerate the most important.

Cucubalus, intended by Linnæus to include a number of *Silenes* with very inflated calyces, but since restricted to the *S. baccifer*, in which the fruit, although not exactly a berry, has the appearance of one, and does not open in valves, may still be conveniently retained as a genus; for that very decided and exceptional character

is accompanied by considerable differences in the general aspect as well of the flower as of the whole plant.

Heliosperma, Reichb., proposed for a few small white-flowered *Silenes* with very muricate seeds, and *Elisanthe*, Fenzl, adopted by Willkomm for the species with laciniate petals, usually red, though both well marked in a very few cases, are too closely connected through others with the great mass of the genus to form more than sections, and even as such are not so good as *Coniomorpha*, for instance, and *Behenanthe*.

Melandrium, Roehl., has about a dozen species of *Lychnis*, chiefly northern or alpine, with inflated calyxes, and the teeth or valves of the capsule splitting into two so as to become double in number to the styles. But the calyx in some species passes gradually into that of *Lychnis* proper, and the splitting of the capsule-teeth in others is exceedingly slight, and we cannot attach much importance to it in this any more than in other Caryophylleous genera.

Viscaria, Roehl., was originally proposed for a few species in which the ovary is shortly divided at the base into 5 cells—a slight rudimentary indication of the typical formation of the gynæcium, of little more importance here than in the few *Silenes* and *Dianthus*es in which it occurs. Two of the four *Viscarias* have been again separated under the name of *Eudianthe*, as having the capsular teeth split. These formed part of *Agrostemma*, Linn., characterized by the long narrow calyx-teeth. The latter name has now been restricted to a single species only differing from *Lychnis* proper by those calyx-teeth and by the stiffness of the scales at the base of the petals; and another *Agrostemma* of Linnæus has been erected into the genus *Githago*, as having the styles alternating with, not opposite the sepals—a circumstance very difficult to ascertain with certainty in the gamosepalous genera, especially in the dried state, and which, if correct, may be due to a slight torsion of the torus.

Petrocoptis, A. Braun, comprising two Pyrenæan species, has a more definite character in the expansion of the funiculus into a small strophiola; but the habit is not very marked, and there is no other character. The æstivation of the petals is indeed said not to be contorted as in other Caryophylleæ, but it certainly is so occasionally, and a few other species of *Lychnis* have been observed where the contorted arrangement is sometimes broken. I have also myself seen it so not unfrequently in *Stellaria holostea*, and it probably occurs in other instances.

Uebelinia, Hochst., a single Abyssinian species, may, however, have sufficient claims to be admitted as a genus. Besides the reduction of the stamens to 5, the shape of the calyx, the habit, and inflorescence are very different from those of *Lychnis*, reminding one of *Gypsophila cerastioides*. The calyx has 10 ribs, and the styles are 5 as in *Lychnis*.

The numerous species of the tribe ALSINÆ have always been found very difficult to divide into natural genera with definite characters. For those without stipules more than thirty have been proposed, of which, however, we think it most convenient to adopt the following eleven only: 1. *Holosteum*, Linn.; 2. *Cerastium*, Linn.; 3. *Stellaria*, Linn.; 4. *Brachystemma*, Don; 5. *Arenaria*, Linn.; 6. *Buffonia*, Linn.; 7. *Sagina*, Linn.; 8. *Colobanthus*, Bartl.; 9. *Thylacospermum*, Fenzl; 10. *Schiedea*, Cham. et Schlecht.; and 11. *Queria*, Linn.; and to these we add the two stipulate genera—12. *Spergula*, Linn., and 13. *Spergularia*, Pers. Of these genera the four principal ones were supposed to have been well defined by the earlier botanists—*Cerastium* by 5 styles and bifid petals, *Stellaria* by 3 styles and bifid petals, *Arenaria* by 3 styles and entire petals, *Sagina* by 4 styles and entire petals. But in each case species have been since observed where these characters have not proved constant, or where their strict adoption has occasioned severances too purely artificial to be maintained, and others have been successively called in aid.

In *Cerastium*, the form of the capsule (its elongated apex always shortly and regularly divided into twice as many teeth as styles) appears not only the best corroborative character, but even to take precedence over those derived from the divided petals and number of styles, as being more in conformity with general habit. We would thus, with Fenzl, bring into *Cerastium* the *Stellaria cerastioides*, Linn., and *S. viscida*, Bieb., although they have the 3 styles of *Stellaria*, as well as the small genus *Mœnchia*, in which the petals are entire or notched only and the flowers isomerous throughout as in *Sagina*, although the styles are opposite the sepals as in *Cerastium*. The two species referred to *Mœnchia*, the one with 4-merous, the other with 5-merous flowers, were therefore formerly placed, the first in *Sagina*, the other in *Cerastium*, but it is now generally believed that they are mere varieties of one species. Again, the *Arenaria purpurascens*, Ram., a Pyrenæan plant with much of the habit of *Cerastium trigynum* (*Stellaria cerastioides*), but with the petals and styles of *Arenaria*, and pro-

posed as a distinct genus under the name of *Dufourea*, might, on account of the capsule, be better referred to *Cerastium*, where Fenzl once placed it.

Holosteum is a small genus, most elaborately described by J. Gay, and reducible, as he proposes, to two or even to a single species. It has the capsule of *Cerastium*, but may be maintained as distinct on account of the habit and inflorescence and the peculiar seed. This is flattened from front to back as in *Dianthus* and its allies, but the radicle, instead of being short and straight as in those genera, is turned down in a projection of the inner face by which the seed is attached, thus combining the two forms of embryo which prevail in Caryophyllæ.

Stellaria is a large and widely spread genus, tolerably natural, and, as to the large majority of species, well marked by the three styles, bifid petals, and the capsule divided to about the middle into as many entire or bifid valves. But there are a few anomalous species, mostly isolated or nearly so, which have been separated into distinct genera upon real or fancied discrepancies, which however we think ought, from the general concordance of characters, to be retained in *Stellaria*. These are—

1. *Larbrea*, A. de St. Hil., founded on *S. uliginosa*, which has the petals and stamens more distinctly perigynous than in most other species, though still very slightly so; but this is a question of degree only, as a more or less distinct perigyny may be observed in several other species where the petals are much reduced.

2. *Malachium*, Fries, has been generally adopted for the *S. aquatica*, placed by Linnæus in *Cerastium* as having 5 styles. It differs, however, from that genus in the styles being alternate with, not opposite to, the sepals. The habit, petals, &c., are those of *Stellaria nemorum*; the capsule only differs in the valves being rather less deeply bifid; and the number of styles is, in Indian specimens, not unfrequently reduced to three as in other *Stellarias*.

3. *Krascheninikowia*, Turcz., was adopted by Fenzl as distinguished by the petals emarginate only or shortly bifid, although the original Siberian *K. rupestris* is apparently identical with the Carpathian *Stellaria bulbifera*, and very nearly allied to some other eastern or South-European species. The genus has, however, since been remodelled by Maximowicz and made to rest on dimorphous flowers, the apparently perfect ones in the East-Asiatic specimens being usually sterile, whilst the seeds are produced by small, almost apetalous oligandrous flowers near the base of the stem. But this, although, as far as I am aware, the first

case of dimorphism observed in the flowers of Caryophyllæ, has now been ascertained to exist in so many different Polypetalous orders, and to be so frequently not even of specific value, that we cannot admit it as a generic character when unaccompanied by any other.

4. *Leucostemma*, Benth., was a genus I originally proposed for two Himalayan species with tetramerous flowers, at a time when the number of parts was still considered as of absolute value in the generic distinction of Caryophyllæ; but Fenzl has since very properly reduced them to *Stellaria*, of which they have all the other characters.

5. *Adenonema*, Bunge, containing a few high alpine Asiatic and South-American species, differs from *Stellaria* as *Cherleria* from *Arenaria*, by its short densely tufted stems, the excessively reduced petals, and more developed glands of the disk; and the same arguments which have induced many botanists to reduce *Cherleria* to *Arenaria* (or *Alsine*) would equally apply to the reunion of *Adenonema* with *Stellaria*, especially as the passage from the one to the other is gradual.

6. *Schizotechium*, Fenzl, although only proposed as a section of *Stellaria*, might have perhaps rather more claims than any of the preceding to be adopted as a genus. It consists of two Himalayan species with a scandent habit and diffuse panicles, almost as in *Brachystemma*, and only 3 ovules, of which but one ripens. The ovary might thus be supposed to be reduced to uniovulate carpels, and to be brought technically nearer to that of Phytolaccæ; but there is no central axis, and a slight comparison of actual specimens will at once give the idea that it is an exceptional and irregular reduction in the ovules of a closely compound ovary, and not a normal conformity of the ovules with as many distinct or well-marked carpels. The foliage, inflorescence, and flowers are in all other respects those of *Stellaria*, in which genus we continue to retain *Schizotechium* as a section.

Brachystemma, Don, to which we have just alluded as resembling *Schizotechium* in habit, is a single Himalayan species with the entire petals of *Arenaria*. The stamens, of which 5 only bear anthers, the 2 styles, 4 ovules, and usually one-seeded capsule, may also be found occasionally in that genus; but all these features being united and accompanied by a different habit, a large scarious calyx with minute petals may warrant us in retaining it as a distinct genus.

We now come to the great genus *Arenaria*, whose limits are

the most puzzling to define among the whole range of Caryophyllæ. Originally characterized by 5 sepals, 5 entire petals, 10 or rarely 5 stamens, and 3 styles, it was subsequently found that these numbers were liable to variation, that in some species the petals were excessively reduced or disappeared altogether, in others the styles were frequently reduced to 2, and that characters derived from number could no longer exclude the Linnean genera *Cherleria*, *Minuartia*, *Mœhringia*, &c., whilst on the other hand the capsule appeared to afford means of dividing the whole group in a more definite manner. Accordingly the greater number of species have been distributed into three principal genera, *Arenaria*, *Mœhringia*, and *Alsine*; and at least ten others have been proposed, chiefly for individual species in which some striking peculiarity has been observed. But a further consideration of the results has convinced us that the three large groups are far too unnatural to be considered as more than artificial sections; and that the prominent characters of the monotypic genera differ but in degree from those exemplified in other species. *Spergularia* alone forms an exception, and is generally admitted; for although the presence of stipules is its only positive character, its affinity is evidently much more with *Spergula* than with *Arenaria*.

Arenaria itself is limited by Fenzl and others to those species in which the capsular valves are more or less deeply divided so as to become double the number of the styles, and the seeds are without any strophiola; *Mœhringia* has a similar capsule, but the seeds are smooth and shining, with the funicle expanded into a strophiola; and *Alsine* has the capsular valves entire, of the same number as the styles. These characters are tolerably definite, and not liable to much variation in the same species, and therefore excellent for sectional distinction. But when it is considered that *A. Ledebouriana*, *A. Roylei*, and their allies are in *Arenaria*, whilst *A. laricifolia*, *A. pinifolia*, &c., are in *Alsine*,—that *A. pubescens*, *A. hispida*, and *A. diffusa*, Ell. (*A. nemorosa*, H. B. et K.), go together in *Arenaria*, whilst *A. trinervis*, *A. bavarica*, and *A. lateriflora* are in *Mœhringia*,—that *A. polygonoides* is in *Mœhringia* and *A. procumbens* in *Alsine* (or in *Rhodalsine* of Gay),—that *A. modesta*, *A. conimbricensis*, &c., are retained in *Arenaria*, whilst all their nearest allies belong to *Alsine*, and that the alpine cæspitose species are also distributed between the two, these sections can scarcely be considered as better genera than the old Linnean one.

The characters upon which the smaller, mostly monotypic genera *Cherleria*, *Siebera*, *Minuartia*, *Dolophragma*, *Triplateia*, *Gouf-*

feia, *Lepyrodiclis*, *Odontostemma*, *Honckeneya*, and *Merckia* have been founded are chiefly,—unisexuality, absence of petals, a great development of the glands of the disk, the division of the ovary into 3 cells, the complete separation of the capsular valves to the base, or a reduction in the number of stamens, styles, or ovules.

Unisexuality, or rather polygamy, has been much relied on for the genus *Honckeneya*, made for the *A. peploides*. But although in Europe and Asia the plant is certainly most frequently unisexual, yet in America it is generally, and according to A. Gray universally, hermaphrodite, without there being any other distinction between the two races.

The absence of petals induced Linnæus to separate *Cherleria* and *Minuartia*; but this absence has been since shown not to be constant, and other species closely allied to the one or to the other in habit have very minute petals, which again, through other species, pass into those of more conspicuous size; and accordingly Fenzl and others have already united these two genera with *Alsine*.

The glands of the disk are more or less developed in many *Arenarias*, but are only taken as generic characters as being specially prominent in *Cherleria* and in *Honckeneya*, two species which have nothing else to connect them but what is common to the whole genus *Arenaria*.

The division of the ovary into three cells is relied upon for *Dolophragma*, *Honckeneya*, and *Merckia*; and if it were constant and persistent, and only to be seen in the two latter, it might be made use of to separate them, as they have also in common a larger, almost succulent globular capsule, and some affinity in habit. But the dissepiments are only to be found at a very early stage; they are always very thin and slender, and have generally disappeared by the time the flower has expanded, and I at least have never found any remains of them when the capsule is ripe. This division into cells can therefore only be regarded as rudimentary; it may be traced here and there throughout Caryophyllæ, and, as in other cases of undeveloped rudimentary organs, no further systematic value can be attributed to it than as an indication of the normal type, of which the Caryophyllaceous ovary is a modification.

The valves of the capsule separate to the base and spread out horizontally in *Triplateia*. But the depth to which the capsule splits is very variable in the whole genus; and, in the single *Triplateia* known, there is nothing marked in habit to distinguish it from some *Mœhringias*, whilst any other exceptional characters

which it possesses are also to be found in species which have not the same capsule or habit.

The stamens are reduced to 5 in *Triplateia*, in a few *Alsines*, and occasionally in other species which have little else in common with them.

The styles and, consequently, the carpels are reduced to 2, and the ovules to 4, with a depressed globular capsule, in *Gouffeia*, *Lepyrodiclis*, and *Odontostemma*, and this brings these four species (*Lepyrodiclis* having two) technically as near to *Buffonia* as to *Arenaria*; but their habit is so dissimilar from each other (except that of *Odontostemma* to one species of *Lepyrodiclis*), and that of two of them so near to that of two corresponding species of *Arenaria* proper, that they can only form a very artificial group, which we prefer to consider as a section of *Arenaria*, where a similar but less constant reduction of carpels or of ovules occurs in other very dissimilar species.

It might be said that where two or three of these exceptional characters are combined, such as the split capsule and reduced ovules and stamens in *Triplateia*, or unisexuality, large glands, and rudimentary dissepiments in *Honckeneya*, they might warrant generic separation; and so it would be if any such plant had these characters exclusively, or if they were similarly combined in several species having some general features in common; but as neither is the case in any of the above instances, we can only consider the plants so isolated as exceptional species, not as separate groups.

To the numerous small genera above enumerated as separated from *Arenaria* on insufficient grounds, we may add the following nine proposed or adopted by Reichenbach on still more trifling characters: *Sabulina*, *Tryphane*, *Facchinia*, *Alsinanthe*, *Neumayera*, *Wierzbeckia*, *Plinthine*, *Pettera*, and *Eremogone*.

With regard to *Buffonia*, it is with much hesitation that we have retained it as a small distinct genus; for the distinctive characters are very slight; and although the four (5 or 6?) species which compose it have much resemblance in habit, they also come very near to some of the small-flowered fine-leaved *Arenarias*.

Sagina was formerly a purely artificial genus, comprising all the tetramerous *Alsineæ*; but as some of these have been shown to be mere varieties of pentamerous species placed in *Cerastium* or in *Spergula*, the genus has been remodelled by Fenzl, so as to exclude *S. erecta* and to include those *Spergulas* of Linnæus which have no stipules. It has thus become much more natural, and although still very nearly allied to some of the smaller *Arenarias*, it is well

characterized by the styles, whether 4 or 5, always isomerous with the sepals, and alternating with, not opposite to them as in *Cerastium*, and as in the old *Sagina* (or *Mœnchia*) *erecta*, now transferred to *Cerastium*, of which it has also the capsule. The pentamerous *Saginas* have been proposed by some German authors as a distinct genus under the name of *Spergella*; but the character is purely artificial, and not always constant in the same species.

The four remaining small genera of exstipulate *Alsineæ* have each some remarkable peculiarity of structure which has occasionally suggested their respective removal to some other order, but their general affinities are clearly with *Alsineæ*, and I have already alluded to the insufficiency of these peculiarities for their removal. Thus, *Colobanthus* has no petals, and the stamens, of the same number as the sepals, are alternate with, not opposite to them; but the remaining characters and habit are those of *Sagina*: *Thylacospermum* only differs from the low tufted alpine Cherlerioid *Arenarias* by the calyx forming an obconical tube at the base, round the margin of which are inserted the stamens, which are thus, exceptionally, very perigynous: *Schiedea*, with the habit and most of the characters of some *Stellarias*, is distinguished by the remarkable position of the petals (or staminodia?) opposite the petals, already alluded to: and *Querria*, very near some of the smaller annual *Arenarias*, has only one ovule and no petals, and thus passes into *Paronychiaceæ*; but as the fruit is a three-valved capsule and not a utriculus, I have preferred retaining it among *Alsineæ*.

The stipulate *Alsineæ* comprise two genera of three or four species each—*Spergula*, Linn., and *Spergularia*, Pers. (*Lepigone*, Fries)—differing by their stipules only, the first from *Sagina*, the second from *Arenaria*. This character, admitted as ordinal by some botanists who transfer these genera to *Paronychiaceæ*, is rejected by others even as generic, as being derived from vegetative organs alone. Estimating its value from its practical relation to habit, we are induced in this instance to consider it as generic, placing *Spergula* and *Spergularia* in the tribe of *Alsineæ*, of which they have the free styles, rather than with the other stipulate *Caryophyllæ* which form our tribe of *Polycarpeæ*.

Balardia, Cambess., is a South-American *Spergularia* with reduced petals and stamens, and has been correctly referred to that genus by Fenzl and others.

The *Caryophyllæ* of our third tribe, *POLYCARPEÆ*, with free sepals and the styles more or less united, are almost all stipulate.

They comprise the eleven following genera :—1. *Drymaria*, Willd. ; 2. *Polycarpon*, Linn. ; 3. *Ortegia*, Linn. ; 4. *Læflingia*, Linn. ; 5. *Cerdia*, Moç. et Sess. ; 6. *Pycnophyllum*, Remy ; 7. *Lyallia*, Hook. fil. ; 8. *Microphytes*, Philippi ; 9. *Stipulicida*, Rich. ; 10. *Polycarpæa*, Lam. ; and 11. *Sphærocoma*, Anders. Very few of these require any special observations.

Arversia, Cambess., or *Hapalosia*, W. et Arn., ought in our opinion to be reduced to *Polycarpon*. The embryo is indeed straighter in *Arversia* (*Hapalosia*) *Læflingii* than is usual in *Polycarpon*, but it is very variable in the undoubted species of the latter genus, and I have in vain searched for the spiral twist in the valves of the capsule supposed to characterize the typical *P. tetraphyllum*.

Stichophyllum, Philippi, figured in his 'Flora of Atacames,' proves, on examination of his specimens, to be identical with one species of *Pycnophyllum*, Remy. The same plant in Meyen's collection received from Presl the manuscript name of *Xeria Meyeniana*, and is, according to Walpers, the *Arenaria bryoides*, Willd.

Lyallia, Hook. fil., is but very imperfectly known, and is only placed here from its close resemblance in habit to *Pycnophyllum*.

Cerdia, Moç. et Sess., is only known from DeCandolle's characters taken from Moçino and Sesse's drawing.

Polycarpæa, Lam. (proposed by Webb to be spelt *Polycarpia*, but perhaps without sufficient grounds for disturbing the established orthography), is now a large genus divisible into several groups, some of them distinguished by habit without characters, and others which have more definite characters have so precisely the aspect of the typical *Polycarpæas* that we cannot adopt them as separate genera. I allude especially to the two supposed Australian genera, *Aylmeria*, Mart., and *Planchonia*, J. Gay. The former closely resembles the common *P. corymbosa*, but the flowers are rather larger and more scarious, and there are 5 minute staminodia alternating with the stamens at the base of the petals. In *Planchonia*, of which we have five or six species, the flowers are often still larger and more scarious ; there are no staminodia ; but the petals and stamens are united, sometimes above the middle into a long tube, sometimes at the base only into a shorter cup. Yet striking as the character is in some species, it is one of degree only, and a slight union may be observed in some other non-Australian species.

Sphærocoma, T. Anders., like *Queria*, is intermediate between Caryophylleæ and Paronychiaceæ. The fruit is an indehiscent utriculus as in the latter order ; but the presence of petals, and

the two ovules with the funicles united in a central columella, show more affinity with Caryophyllæ.

II. PORTULACÆ.

This Order, once more reduced by most botanists to its above-mentioned original and natural limits, consists at present of about 125 species distributed into the following 14 genera:—1. *Portulaca*, Linn.; 2. *Portulacaria*, Jacq.; 3. *Grahamia*, Gill.; 4. *Talinopsis*, A. Gray; 5. *Anacampseros*, Linn.; 6. *Talinum*, Adans.; 7. *Calandrinia*, H. B. et K.; 8. *Claytonia*, Linn.; 9. *Spraguea*, Torr.; 10. *Monocosmia*, Fenzl; 11. *Montia*, Linn.; 12. *Silvæa*, Philippi; 13. *Calyptridium*, Nutt.; and 14. *Lewisia*, Pursh.

Of the above genera, *Portulaca*, comprising a considerable number of species, and *Portulacaria* and *Lewisia*, each of a single species, are too well marked by the exceptional characters already alluded to (p. 58) to admit of any doubt. *Grahamia* from Chili and *Talinopsis* from New Mexico, both monotypic, and *Anacampseros* from South Africa, consisting of about eight species, are closely connected by their nearly straight or slightly curved (not annular) embryo with very little albumen, and by some general resemblances in their flowers; yet, as slight differences in the calyx and bracts accompany considerable diversity in habit and a wide geographical separation, they may be maintained as distinct genera, unless the discovery of intermediate species should hereafter connect them more closely.

Talinum, *Calandrinia*, and *Claytonia* are also very closely allied to each other, being only separated by the sepals, deciduous in *Talinum*, persistent in the two others, or by the stamens, constantly 5 (one opposite each petal) in *Claytonia*, anisomerous with the petals and usually more numerous in *Talinum* and *Calandrinia*. These characters are moreover not quite constant; yet, as each group comprises a considerable number of species bearing other general resemblances to each other, we feel that it would not be safe to recommend their union into one genus without a more detailed examination of every species than can be undertaken on the present occasion.

Spraguea, a single Californian species, is nearly allied to *Claytonia*; but the remarkable calyx gives it so peculiar an aspect, that we do not venture to reduce it.

Montia, also monotypic, is, however, very distinctly characterized by its stamens (usually 3) inserted in the tube of a gamopetalous corolla.

The three remaining genera—*Silvæa*, said to consist of four species (of which I have only seen and examined one), and *Monocosmia* and *Calyptridium*, both monotypic—agree in their very small monandrous flowers; but evident differences in their inflorescence and sepals, and alleged ones in their corollas, which, on account of their extreme tenuity and rapid fading, I am unable to verify with certainty in dried specimens, have induced me to maintain them as distinct.

Baitaria, Ruiz et Pav., is one of the dwarf alpine species of *Calandrinia*, of which the bracts have been described as outer sepals. *Diazia*, Philippi, described and figured from a single very imperfect specimen, is probably also a species of *Calandrinia* with the stamens very much reduced in number. At any rate, should it hereafter prove distinct, the name must be altered, as too closely resembling *Diasia*, an Irideous genus.

Fouquieria, H. B. et K. (including *Bronnia*, H. B. et K.), connected by some authors with Portulacæ, by others with Polemoniaceæ, is perhaps more nearly related to some of the Calyciflorous groups connected with Saxifragaceæ, which we reserve for future consideration.

III. MOLLUGINEÆ.

This small group, whether considered as a tribe of Phytolaccaceæ or as an allied order, ought, in our opinion, to be limited to the following seven genera:—1. *Macarthuria*, Endl.; 2. *Telephium*, Linn.; 3. *Orygia*, Forsk. (*Axonotechium*, Fenzl); 4. ? *Glinus*, Linn.; 5. *Mollugo*, Linn.; 6. *Pharnaceum*, Linn. (*Ginginsia*, DC.; *Hyperteles*, E. Mey.); 7. *Cœlanthium*, E. Mey. In the four first genera petals are occasionally, or, in two or three species, always present; the three others, forming the great proportion of the tribe or order, are always apetalous. The total number of species is, however, not above 40.

Macarthuria was originally referred to the vicinity of Buettneriaceæ, but upon what grounds it is very difficult to imagine; the very imbricate sepals, the insertion of the stamens, the habit, &c., being so totally at variance with all the Malvoid orders. Harvey first pointed out (Kew Journ. Bot. vii. 55) its affinity with Phytolaccaceæ, and F. Müller has, I believe (although I am unable now to find a reference to his note), referred it to Mollugineæ. One species has always petals, another is quite apetalous; the ovary, styles, capsule, and seeds are quite those of Mollugineæ. The stamens appear to be always 8 in an otherwise pentamerous

lower; but this want of symmetry between the number of stamens and that of the petals or sepals is very common in the whole group.

Telephium is exceptional among Mollugineæ, in that the ovary is divided into cells at the base only, but the dissepiments, short as they are, are firm and persistent; the sepals, petals, and stamens are isomerous, and the stamens are opposite the sepals, as in several Caryophyllæ; but the alternate leaves, the inflorescence, the consistence of the sepals, and other characters are those of Mollugineæ, and a very cursory comparison with *Orygia* shows a very intimate connexion of the two genera.

Orygia (a single species, dispersed over the hot dry regions of Africa and Asia) has indefinite stamens surrounded by narrow-linear petals, very variable in number or occasionally entirely wanting, and which are by some termed staminodia or barren stamens. In this respect the genus approaches *Glinus*, whilst the foliage, habit, and inflorescence are very nearly those of *Telephium*, under which genus it has sometimes been classed.

Glinus forms so gradually the passage from *Orygia* to *Mollugo*, that it is hard to assign to it precise limits; the common species has usually indefinite stamens (between 10 and 20) as in *Orygia*, but clustered axillary flowers as in several *Mollugos*, whilst the woolly indumentum and the large calyxes give it a very different aspect from the latter genus. A second species (or, according to some, a small-flowered variety only) has the reduced stamens of *Mollugo*, but the aspect of *Glinus*; and the *Mollugo spergula* of Linnæus, with the small glabrous flowers and few stamens of *Mollugo*, is considered by Fenzl as a third species of *Glinus*, of which it has the strophiolate seeds. The inflorescence is rather that of *M. verticillata* (which has no strophiola to the seeds) than of *Glinus*. This gradual connexion might suggest the propriety of considering *Glinus* altogether as a section only of *Mollugo*, which, after all, would only contain about a dozen species.

Pharnaceum is a Cape genus of about eighteen species, distinguished from *Mollugo* chiefly by fimbriate stipules and a peculiar habit. Several of the species have also a cupular hypogynous disk within the stamens, but this is not constant even in all the species considered as true *Pharnacea*. A small section, *Hyperteles*, E. Mey., retained by Harvey and Sonder as a distinct genus, has no disk and indefinite stamens; an increase, however, in the number of stamens beyond 5 occurs in some species considered as true *Pharnacea*, and the habit of the two sections is the same.

Cælanthium, limited to two Cape species, differs from *Pharnaceum* as *Thylacospermum* from *Arenaria*, by the union of the sepals at the base into a campanulate tube, round the edge of which are inserted the stamens, being thus much more decidedly perigynous than in the rest of the group.

The genera *Psammotrophe*, Eckl. & Zeyh., and *Polpoda*, Presl, with uniovulate cells to the ovary, enumerated by Fenzl among Mollugineæ, appear to have nothing to distinguish them from true Phytolaccaceæ. *Adenogramma*, Presl, is also a Phytolaccaceous plant allied to *Giesekia*, where the ovary and fruit are reduced to a single one-seeded carpel, not compounded of 2 or 3 carpels although one-seeded as in Paronychiaceæ. *Acrossanthes*, on the other hand, both in habit and character, belongs to the apetalous Ficoideæ.

IV. PARONYCHIACEÆ.

Without having sufficiently examined all the genera of this Order to ascertain their limits with respect to each other, or the order of their arrangement, we have, however, verified the ordinal characters in all the following (except *Cardionema*):—

1. *Corrigiola*, Linn. (an exceptional genus in its prominent petals and alternate leaves); 2. *Herniaria*, Linn.; 3. *Illecebrum*, Linn.; 4. *Cardionema*, DC.; 5. *Pentacæna*, Bartl.; 6. *Paronychia*, Juss. (including *Siphonychia*, Torr. et Gray, and *Anychia*, Rich., and perhaps altogether, with *Cardionema* and *Pentacæna*, artificial sections of *Illecebrum*); 7. *Habrosia*, Fenzl; 8. *Sclerocephalus*, Boiss.; 9. *Gymnocarpos*, Forsk.; 10. *Pteranthus*, Forsk.; 11. *Cometes*, Burm.; 12. *Dicheranthus*, Webb; 13. *Pollichia*, Soland.; 14. *Guilleminea*, H. B. et K.; 15. *Mniarum*, Forst.; 16. *Scleranthus*, Linn.; and 17. *Lastarria*, A. Gay.

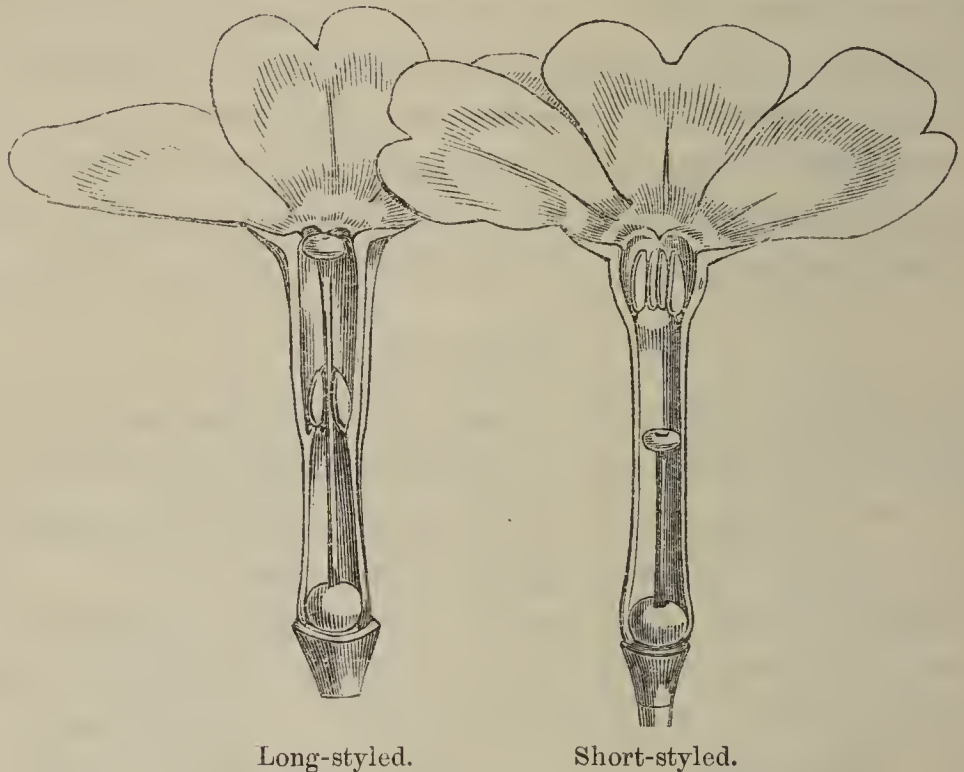
On the Two Forms, or Dimorphic Condition, in the Species of *Primula*, and on their remarkable Sexual Relations. By CHARLES DARWIN, M.A., F.R.S., F.L.S., &c.

[Read Nov. 21, 1861.]

IF a large number of Primroses or Cowslips (*P. vulgaris* and *veris*) be gathered, they will be found to consist, in about equal numbers, of two forms, obviously differing in the length of their pistils and stamens. Florists who cultivate the Polyanthus and Auricula are well aware of this difference, and call those which display the globular stigma at the mouth of the corolla “pin-headed” or “pin-eyed,” and those which display the stamens “thumb-eyed.” I

will designate the two forms as long-styled and short-styled. Those botanists with whom I have spoken on the subject have looked at the case as one of mere variability, which is far from the truth.

In the Cowslip, in the long-styled form, the stigma projects just above the tube of the corolla, and is externally visible; it stands high above the anthers, which are situated halfway down the tube,



and cannot be easily seen. In the short-styled form the anthers are attached at the mouth of the tube, and therefore stand high above the stigma; for the pistil is short, not rising above halfway up the tubular corolla. The corolla itself is of a different shape in the two forms, the throat or expanded portion above the attachment of the anthers being much longer in the long-styled than in the short-styled form. Village children notice this difference, as they can best make necklaces by threading and slipping the corollas of the long-styled flowers into each other. But there are much more important differences. The stigma in the long-styled plants is globular, in the short-styled it is depressed on the summit, so that the longitudinal axis of the former is sometimes nearly double that of the latter. The shape, however, is in some degree variable; but one difference is persistent, namely, that the stigma of the long-styled is much rougher: in some specimens carefully compared, the papillæ which render the stigmas rough were in the long-styled form from twice to thrice as long as in the short-styled. There is another and more remarkable difference, namely, in the size of the pollen-grains. I measured with the micrometer many

specimens, dry and wet, taken from plants growing in different situations, and always found a palpable difference. The measurement is best made with grains distended with water, in which case, the usual size of the grains from short-styled flowers is seen to be $\frac{10-11}{7000}$ of an inch in diameter, and those from the long-styled about $\frac{7}{7000}$ of an inch, which is in the proportion of three to two; so that the pollen-grains from the short stamens are plainly smaller than those from the long stamens which accompany the short pistil. When examined dry, the smaller grains from the long-styled plants are seen under a low power to be more transparent than the larger grains, and apparently in a greater degree than can be accounted for by their less diameter. There is also a difference in shape, the grains from the short-styled plants being nearly spherical, those from the long-styled being oblong with the angles rounded; this difference in shape disappears when the grains are distended with water. Lastly, as we shall presently see, the short-styled plants produce more seed than the long-styled.

To sum up the differences:—The long-styled plants have a much longer pistil, with a globular and much rougher stigma, standing high above the anthers. The stamens are short; the grains of pollen smaller and oblong in shape. The upper half of the tube of the corolla is more expanded. The number of seeds produced is smaller.

The short-styled plants have a short pistil, half the length of the tube of the corolla, with a smooth depressed stigma standing beneath the anthers. The stamens are long; the grains of pollen are spherical and larger. The tube of the corolla is of the same diameter till close to its upper end. The number of seeds produced is larger.

I have examined a large number of flowers; and though the shape of the stigma and the length of the pistil vary, especially in the short-styled form, I have never seen any transitional grades between the two forms. There is never the slightest doubt under which form to class a plant. I have never seen the two forms on the same plant. I marked many Cowslips and Primroses, and found, the following year, that all retained the same character, as did some in my garden which flowered out of their proper season in the autumn. Mr. W. Wooler, of Darlington, however, informs us that he has seen the early blossoms on Polyanthus which were not long-styled, but which later in the season produced flowers of this form. Possibly the pistils may not in these cases have become fully developed during the early spring. An excellent

proof of the permanence of the two forms is seen in nursery gardens, where choice varieties of the Polyanthus are propagated by division; and I found whole beds of several varieties, each consisting exclusively of the one or the other form. The two forms exist in the wild state in about equal numbers: I collected from several different stations, taking every plant which grew on each spot, 522 umbels; 241 were long-styled, and 281 short-styled. No difference in tint or size could be perceived in the two great masses of flowers.

I examined many cultivated Cowslips (*P. veris*) or Polyanthuses, and Oxlips; and the two forms always presented the same differences, including the same relative difference in the size of the pollen-grains.

Primula Auricula presents the two forms; but amongst the improved fancy kinds the long-styled are rare, as these are less valued by florists, and seldomer distributed. There is a much greater relative inequality in the length of the pistils and stamens than in the Cowslip, the pistil in the long-styled form being nearly four times as long as in the short-styled, in which it is barely longer than the ovarium; the stigma is nearly of the same shape in both forms, but it is rougher in the long-styled, though the difference is not so great as in the two forms of the Cowslip. In the long-styled plants the stamens are very short, rising but little above the ovarium. The pollen-grains of these short stamens from the long-styled plants, when distended with water, were barely $\frac{5}{6000}$ of an inch in diameter, whereas those from the long stamens of the short-styled plants were barely $\frac{7}{6000}$, showing a relative difference of five to seven. The smaller grains of the long-styled plants were much more transparent, and before distention with water more triangular in outline than those of the other form. In one anomalous specimen with a long pistil, the stamens almost surrounded the stigma, so that they occupied the position proper to the stamens of the short-styled form; but the small size of the pollen-grains showed that these stamens had been abnormally developed in length, and that the anthers ought to have stood at the base of the corolla.

In the two forms of *Primula Sinensis*, the pistil is about twice as long in the one as in the other. The stigma of the long-styled varies much in shape, but is considerably more elongated and rougher than that of the short-styled, the latter being nearly smooth and spherical, but depressed on the summit. The shape of the throat of the corolla in the two forms differs as in the Cow-

slip, as does the length of the stamens. But it is remarkable that the pollen-grains of both forms, wet and dry, presented no difference in diameter; they vary somewhat in size, as do the pollen-grains of all the species, but in both forms the average diameter was rather above $\frac{10}{6000}$ of an inch. There is one remarkable difference in the two forms of this species, namely (as we shall presently more fully see), that the short-styled plants, if insects be excluded and there be no artificial fertilization, are quite sterile, whereas the long-styled produce a moderate quantity of seed. But when both forms are properly fertilized, the short-styled flowers (as with Cowslips) yield more seed than the long-styled. In a lot of seedlings which I raised, there were thirteen long-styled and seven short-styled plants.

Of *Primula ciliata* a long-styled specimen, and of *P. ciliata*, var. *purpurata*, a short-styled specimen, were sent me from Kew by Prof. Oliver. This case, however, is hardly worth giving, as the variety *purpurata* is said* to be a hybrid between this species and *P. auricula*; and the height of the stamens in the one form does not correspond with the height of the stigma in the other, as they would have done had they been the same species. There was, however, the usual difference in the roughness of the stigmas in the two forms, and the pollen-grains, distended in water, measured $\frac{6}{6000}$ and $\frac{4-5}{6000}$ of an inch in diameter. Single trusses were sent me of *P. denticulata* and *P. Piedmontana* which were long-styled, and of *P. marginata* and *nivalis* which were short-styled; and the general character of the organs leaves hardly any doubt on my mind that these species are dimorphic. In a single flower of *P. Sibirica*, however, which was sent me from Kew, the stigma reached up to the base of the anthers; so that this species is not dimorphic, or not dimorphic as far as the length of the pistil and stamens are concerned, unless indeed this single specimen was anomalous, like that mentioned of *P. auricula*.

We thus see that the existence of two forms is very general, if not universal, in the genus *Primula*. The simple fact of the pollen-grains differing in size and outline, and the stigma, in shape and roughness, in two sets of individuals of the same species, is curious. But what, it may be asked, is the meaning of these several differences? The question seems worthy of careful investigation, for, as far as I know, the use or meaning of dimorphism in plants has never been explained; hence, I will give my obser-

* Sweet's 'Flower Garden,' vol. v. tab. 123.

vations in detail, though I am far from supposing that all cases of dimorphism are alike. The first idea which naturally occurred was, that the species were tending towards a dioicous condition; that the long-styled plants, with their rougher stigmas, were more feminine in nature, and would produce more seed; that the short-styled plants, with their long stamens and larger pollen-grains, were more masculine in nature. Accordingly, in 1860, I marked some Cowslips of both forms growing in my garden, and others growing in an open field, and others in a shady wood, and gathered and weighed the seed. In each of these little lots the short-styled plants yielded, contrary to my expectation, most seed. Taking the lots together, the following is the result:—

	No. of Plants.	No. of Umbels produced.	No. of Capsules produced.	Weight of seed in grains.
Short-styled Cowslips	9	33	199	83
Long-styled Cowslips	13	51	261	91

If we reduce these elements for comparison to similar terms, we have—

	No. of Plants.	Weight of seed in grains.	No. of Umbels.	Weight of seed.	No. of Capsules.	Weight of seed in grains.
Short-styled Cowslips	10	92	100	251	100	41
Long-styled Cowslips	10	70	100	178	100	34

So that, by all the standards of comparison, the short-styled are the most fertile; if we take the number of umbels (which is the fairest standard, for large and small plants are thus equalized), the short-styled plants produce more seed than the long-styled, in the proportion of four to three.

In 1861 I tried the result in a fuller and fairer manner. I transplanted in the previous autumn a number of wild plants into a large bed in my garden, treating them all alike; the result was—

	No. of Plants.	No. of Umbels.	Weight of seed in grains.
Short-styled Cowslips ...	47	173	745
Long-styled Cowslips ...	58	208	692

These figures, reduced as before, give the following proportions :—

	Number of Plants.	Weight of seed in grains.	Number of Umbels.	Weight of seed in grains.
Short-styled Cowslips ...	100	1585	100	430
Long-styled Cowslips ...	100	1093	100	332

The season was much better this year than the last, and the plants grew in good soil, instead of in a shady wood or struggling with other plants in the open field; consequently the actual produce of seed was considerably greater. Nevertheless we have the same relative result; for the short-styled plants produced more seed than the long-styled in the proportion of three to two; but if we take the fairest standard of comparison, namely, the number of umbels, the excess is, as in the former case, as four to three.

I marked also some Primroses, all growing together under the same conditions; and we here see the product :—

	No. of Plants.	Total No. of Capsules.	Good Capsules.	Weight of seed in grains.	Or by Calculation :	Good Capsules.	Weight of seed.
Short-styled Primroses	8	49	40	16		100	40
Long-styled Primroses	9	68	50	10	100	20	

The number of Primrose plants tried was hardly sufficient, and the season was bad; but we here again see (excluding the capsules which contained no seed) the same result in a still more marked manner, for the short-styled plants were twice as productive of seed as the long-styled plants.

I had, of course, no means of ascertaining the relative fertility of the two forms of the Chinese Primrose in a natural condition, and the result of artificial fertilization can hardly be trusted; but sixteen capsules from long-styled flowers, properly fertilized, produce 9·3 grains' weight of seed, whereas eight capsules of short-styled flowers produced 6·1 grains; so that if the same number, namely, 16 of the latter, had been fertilized, the weight of seed would have been 12·2, which would have been nearly in the proportion of four to three, as in Cowslips.

Looking to the trials made during two successive years on the large number of Cowslips, and on these facts with regard to common Primroses and Chinese Primroses, we may safely conclude that the short-styled forms in these species are more productive

than the long-styled forms; consequently the anticipation that the plants having largely developed pistils with rougher stigmas, and having shorter stamens with smaller pollen-grains, would prove to be more feminine in their nature is exactly the reverse of the truth. If the species of *Primula* are tending to become dioicous, which possibly may be the case, the future hypothetical females would have short pistils, and the males would have short stamens; but this tendency is accompanied, as we shall presently see, by other conditions of the generative system of a much more singular nature. Anyhow, the possibility of a plant thus becoming dioicous by slow degrees is worthy of notice, as the fact would so easily escape observation.

In 1860 I found that a few umbels of both long-styled and short-styled Cowslips, which were covered by a net, did not produce seed, though other umbels on the same plants, artificially fertilized, produced an abundance of seed; and this fact shows that the mere covering in itself was not injurious. Accordingly, in 1861 I covered up under a similar net several plants just before they opened their flowers; these turned out as follows:—

	No. of Plants.	No. of Umbels produced,	Product of Seed.
Short-styled	6	24	1·3 grains, or 50 seeds.
Long-styled	18	74	Not one seed.

Judging from the exposed plants which grew all round in the same bed, and had been treated in every way exactly the same, except that they were exposed to the visits of insects, the six short-styled plants ought to have produced 92 grains' weight of seed instead of only 1·3; and the eighteen long-styled plants, which produced not one seed, ought to have produced above 200 grains' weight. The production of the 1·3 grain of seed in the smaller lot was probably due to the action of Thrips or some minute insect. This evidence is sufficient, but I may add that ten pots of Polyanthuses and Cowslips of both forms, protected from insects in my greenhouse, did not set one pod, though artificially fertilized flowers in other pots produced an abundance. So we see that the visits of insects are absolutely necessary to the fertilization of Cowslips. As the exposed plants produced an abundance of seed, the tendency to a dioicous condition, previously remarked on, might have been safely carried on, as we see that there is an effect-

ive agency already at work which would have carried pollen from one sex to the other.

What insects habitually visit Cowslips, as is absolutely necessary for their regular fertility, I do not know. I have often watched them, but perhaps not long enough; and only four times I have seen Humble-bees visiting them. One of these bees was gathering pollen from short-styled flowers alone, another had bitten holes through the corolla; and neither of these would have been effective in the act of fertilization: two others were sucking long-styled plants. I have watched Primroses more attentively during several years, and have never seen an insect visit them; yet from their close similarity in all essential respects to Cowslips, there can hardly be a doubt that they require the visits of insects. Hence I am led to suppose that both Primroses and Cowslips are visited by moths. All the species which I have examined secrete plenty of nectar.

In *Primula Sinensis*, when protected from insects and not artificially fertilized, the case is somewhat, but not materially, different. Five short-styled plants produced up to a given period 116 flowers, which set only seven capsules, whereas twelve other flowers on the same plants artificially fertilized set ten capsules. Five long-styled plants produced 147 flowers, and set sixty-two capsules; so that this form, relatively to the other, sets a far greater number of capsules: yet the long-styled protected flowers do not set nearly so well as when artificially fertilized; for out of forty-four flowers thus treated, thirty-eight set. These remarks apply only to the early setting of the capsules, many of which did not continue swelling. With respect to the product of seed, seven protected short-styled plants, which bore about 160 flowers, produced only half a grain of seed; they ought to have produced 120 grains: so that the short-styled plants, when protected from insects, are nearly as sterile as Cowslips. Thirteen long-styled plants, which bore about 380 flowers, and which as we have seen set many more capsules, produced 25·9 grains of seed; they ought to have produced about 220 grains in weight: so that although far less fertile than the artificially fertilized flowers, yet the long-styled *P. Sinensis*, when protected from insects, is nearly twenty-four times as fertile as the short-styled when protected from insects. The cause of this difference is, that when the corolla of the long styled plants falls off, the short stamens near the bottom of the tube are necessarily dragged over the stigma and leave pollen on it, as I saw by hastening the fall of nearly withered flowers; whereas in the short-styled flowers, the stamens are seated at the mouth of the corolla,

and in falling off do not brush over the lowly seated stigma. In the Cowslip the corolla does not fall off; and both long-styled and short-styled plants are equally sterile when protected from insects. It is a rather curious case, that the falling of the corolla, or its remaining attached when withered, might have a considerable influence on the numbers of a plant, during a year unfavourable to the visits of the proper insects.

In three short-styled plants of *Primula auricula*, protected from insects, the flowers which I fertilized produced seed, but those which were not touched produced none.

In all the species of *Primula* the pollen readily coheres to any object. In all that I have observed, though the stamens and pistils differ in length relatively to each other in the different species, yet, in the two forms of the same species, the stigma of the one form stands at exactly the same height with respect to the corolla as the anthers of the other form. If the proboscis of a dead Humble-bee, or thick bristle, or rough needle be pushed down the corolla, first of one form, and then of the other, as an insect would do in visiting the two mingled forms, it will be found that pollen from the long-stamened form will adhere round the base of the proboscis, and will be left with certainty on the stigma of the long-styled form; pollen from the short stamens of the long-styled form will also adhere a little above the tip of the proboscis, and some will generally be left on the stigma of the other form. Thus pollen will be carried reciprocally from one form to the other. In withdrawing the proboscis from the long-styled form, with pollen adhering near the tip, there will be a good chance of some being left on the flower's own stigma, in which case there will be self-fertilization; but this by no means always occurs. In the short-styled form, on the other hand (and it is important to remember this), in inserting the proboscis between the anthers situated at the mouth of the corolla, pollen, as I repeatedly found, is almost invariably carried down and left on the flower's own stigma. Moreover minute insects, such as Thrips, numbers of which I have observed in Primrose flowers thickly dusted with pollen, could not fail often to cause self-fertilization. We positively know that the visits of large insects are necessary to the fertilization of the species of *Primula*; and we may infer from the facts just given that these visits would carry pollen reciprocally from one form to the other, and would likewise *tend* to cause self-fertilization, more especially in the short-styled (*i. e.* long-stamened) form.

These observations led me to test the potency of the two pol-

lens with respect to the two stigmas in *P. veris*, *Sinensis*, and *auricula*. In each species four crosses can be tried; namely, the stigma of the long-styled by its own-form pollen and by that of the short-styled, and the stigma of the short-styled by its own-form pollen and by that of the other form. It is necessary to use and remember two new terms for these crosses: when the long- and the short-styled stigmas are fertilized by their own-form pollen the union is said to be "homomorphic;" when the long-styled and short-styled stigmas are fertilized by the pollen of the other form, the union is "heteromorphic." I speak of the "own-form pollen," because in the following homomorphic unions, in order to make the experiment perfectly fair, I never placed the pollen of the same flower on its own stigma, but, to avoid the possible ill effects of close interbreeding, I always used the pollen from another plant of the same form. In the following experiments all the plants were treated in exactly the same manner, and were carefully protected from insects as far as that is possible. I performed every manipulation myself, and weighed the seed in a chemical balance. Some of the capsules contained no seed, or only two or three, and these are excluded in the column marked "good pods." First for *P. Sinensis*, as the simplest case.

Primula Sinensis.—TABLE I.

	Number of flowers fertilized.	Total number of pods produced.	Number of good pods.	Weight of seed in grains.	By Calculation. Good Pods. { Weight of seed in grains.
Long-styled by own-form pollen (homomorphic union)	20	18	13	5.9	or as 100 to 45
Long-styled by pollen of short-styled (heteromorphic union)...	24	18	16	9.3	or as 100 to 58
Short-styled by own-form pollen (homomorphic union)	7	5	4	0.9	or as 100 to 22
Short-styled by pollen of long-styled (heteromorphic union)...	8	8	8	6.1	or as 100 to 76
Summary :					
The two homomorphic unions	27	23	17	6.8	
The two heteromorphic unions ..	32	26	24	15.4	

For the sake of comparison, we may reduce these latter figures as follows:—

	Number of flowers fertilized.	Number of good pods.	Weight of seed in grains.	Number of good pods.	Weight of seed in grains.
The two homomorphic unions	100	63	25	100	40
The two heteromor- phic unions	100	75	48	100	64

In the first part of the upper table, the number of flowers fertilized and the simple result is shown; and at the right hand, for the sake of comparison, the calculated product of the weight of seed from 100 good pods of each of the four unions is given; showing that in each case the heteromorphic union is more fertile than the homomorphic union. Beneath we have a simple summary of the two homomorphic and the two heteromorphic unions. And lastly, for the sake of comparison, a calculation has been made from this summary; first, assuming that 100 flowers of both kinds of unions were fertilized; and then to the right hand, assuming that 100 good pods were produced from both unions. If we compare the result, we see that the flowers of the two heteromorphic unions produced a greater number of good pods, and a greater weight of seed, than the flowers of the two homomorphic unions; and again (and this is the fairest element of comparison, for accidents are thus almost eliminated), that the good pods from the two heteromorphic unions yielded more seed, in about the proportion of three to two, than those from the two homomorphic unions. The difference in weight from 100 capsules of the two forms is 24 grains, and this is equal to at least 1200 seeds.

Beneath we have Table II. of *P. veris*, or the Cowslip. The upper part is exactly the same as in the Table of *P. Sinensis*, and we see in each case that the heteromorphic is more fertile than the homomorphic union. The calculated results from the summary of the two homomorphic and the two heteromorphic unions are more complex than with the last species, as I wished to show that, however we proceed, the general result is the same. We see that the assumed hundred flowers, heteromorphically fertilized by the pollen of the other forms, yielded more capsules, more good capsules, and a greater weight of seed; but I rely little on this, as some whole umbels perished after being fertilized. The fairest element of comparison is to take the good capsules alone; and we here see that the 100 from the two heteromorphic unions yielded seed which in weight was as 54 to 35 from the 100 good capsules

of the two homomorphic unions,—that is, nearly as three to two, as in the Chinese Primrose.

Primula veris.—TABLE II.

	Number of flowers fertilized.	Total number of pods produced.	Number of good pods.	Weight of seed in grains.	By Calculation. Good Pods. { Weight of seed in grains.
Long-styled by own-form pollen (homomorphic union)	20	8	5	2.1	or as 100 to 42
Long-styled by pollen of short-styled (heteromorphic union)...	22	15	14	8.8	or as 100 to 62
Short-styled by own-form pollen (homomorphic union)	15	8	6	1.8	or as 100 to 30
Short-styled by pollen of long-styled (heteromorphic union)...	13	12	11	4.9	or as 100 to 44
Summary :					
The two homomorphic unions	35	16	11	3.9	
The two heteromorphic unions	35	27	25	13.7	

For the sake of comparison, we may reduce these figures as follows:—

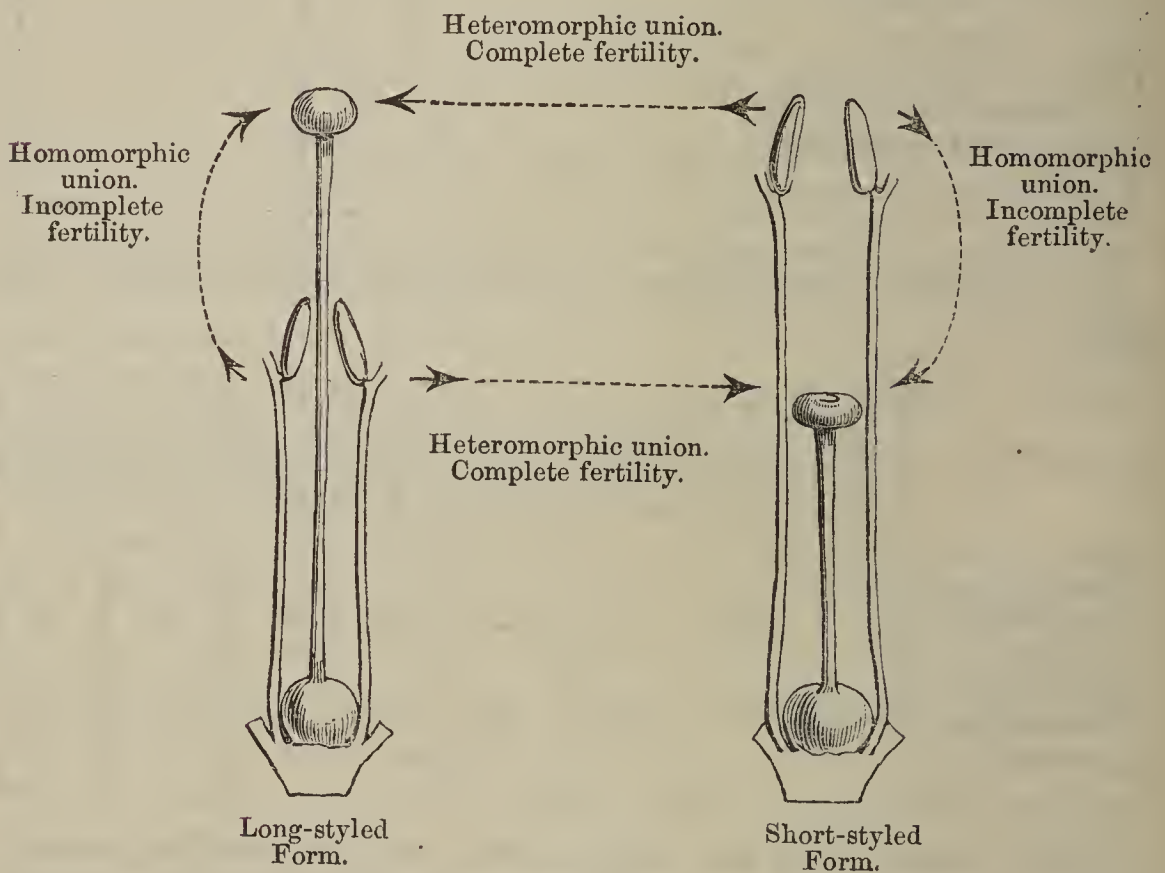
	Number of flowers fertilized.	Total number of pods produced.	Number of good pods.	Weight of seed in grains.	Total number of pods produced.	Weight of seed in grains.	Number of good pods.	Weight of seed in grains.
The two homomorphic unions	100	45	31	11	100	24	100	35
The two heteromorphic unions	100	77	71	39	100	50	100	54

With *P. auricula* I was unfortunate; my few seedlings, except one poor plant, all came up short-styled; and of these plants several died or became sick, owing to the hot weather and the difficulty of excluding insects and ventilating the corner of my greenhouse enclosed with net. I finally got only two pods from one union, and three from the other. The result is given in the following table; and, though worth little, we here again see that the heteromorphic are far more fertile than the homomorphic unions.

Primula auricula.—TABLE III.

	Total number of pods produced.	Number of good pods.	Weight of seed in grains	Good Pods. } Weight of seed in grains.
Short-styled by own-form pollen (homomorphic union) ..	2	1	0.12	or as 100 to 12
Short-styled by pollen of long-styled (heteromorphic union)				
	3	3	1.50	or as 100 to 50

Whoever will study these three tables, which give the result of 134 flowers carefully fertilized and protected, will, I think, be convinced that in these three species of *Primula* the so-called heteromorphic unions are more fertile than the homomorphic unions. For the sake of clearness, the general result is given in the following diagram, in which the dotted lines with arrows represent how in the four unions pollen has been applied.



We here have a case new, as far as I know, in the animal and vegetable kingdoms. We see the species of *Primula* divided into two sets or bodies, which cannot be called distinct sexes, for both are hermaphrodites; yet they are to a certain extent sexually distinct, for they require for perfect fertility reciprocal union. They might perhaps be called sub-dioicous hermaphrodites. As quadrupeds are divided into two nearly equal bodies of different sexes, so here we have two bodies, approximately equal in number,

differing in their sexual powers and related to each other like males and females. There are many hermaphrodite animals which cannot fertilize themselves, but must unite with another hermaphrodite: so it is with numerous plants; for the pollen is often mature and shed, or is mechanically protruded, before the flower's own stigma is ready; so that these hermaphrodite flowers absolutely require for their sexual union the presence of another hermaphrodite. But in *Primula* there is this wide difference, that one individual Cowslip, for instance, though it can with mechanical aid imperfectly fertilize itself, for full fertility must unite with another individual; but it cannot unite with any individual in the same manner as an hermaphrodite Snail or Earth-worm can unite with any other one Snail or Earth-worm; but one form of the Cowslip, to be perfectly fertile, must unite with one of the other form, just as a male quadruped must and can unite only with a female.

I have spoken of the heteromorphic union in *Primula* as resulting in full fertility; and I am fully justified, for the Cowslips thus fertilized actually gave rather more seed than the truly wild plants—a result which may be attributed to their good treatment and having grown separately. With respect to the lessened fertility of the homomorphic unions, we shall appreciate its degree best by the following facts. Gärtner has estimated the degree of sterility of the union of several distinct species*, in a manner which allows of the strictest comparison with the result of the heteromorphic and homomorphic unions of *Primula*. With *P. veris*, for every hundred seeds yielded by the heteromorphic unions, only sixty-four seeds were yielded by an equal number of good capsules from the homomorphic unions. With *P. Sinensis* the proportion was nearly the same—namely, as 100 to 62. Now Gärtner has shown that, on the calculation of *Verbascum lychnitis* yielding with its own pollen 100 seeds, it yields when fertilized by the pollen of *V. Phæniceum* ninety seeds; by the pollen of *V. nigrum*, sixty-three seeds; by that of *V. blattaria*, sixty-two seeds. So again, *Dianthus barbatus* fertilized by the pollen of *D. superbus* yielded eighty-one seeds, and by the pollen of *D. Japonicus* sixty-six seeds, relatively to the 100 seeds produced by its own pollen. Thus we see—and the fact is highly remarkable—that the homomorphic unions relatively to the heteromorphic unions in *Primula* are more sterile than the crosses between several distinct species relatively to the pure union of those species.

The meaning or use of the existence in *Primula* of the two

* Versuche über die Bastarderzeugung, 1849, s. 216.

forms in about equal numbers, with their pollen adapted for reciprocal union, is tolerably plain; namely, to favour the intercrossing of distinct individuals. With plants there are innumerable contrivances for this end; and no one will understand the final cause of the structure of many flowers without attending to this point. I have already shown that the relative heights of the anthers and stigmas in the two forms lead to insects leaving the pollen of the one form on the stigma of the other; but, at the same time, there will be a strong probability of the flower's own pollen being likewise placed on the stigma. It is perfectly well known that if the pollen of several closely allied species be placed on the stigma of a distinct species, and at the same time, or even subsequently, its own pollen be placed on the stigma, this will entirely destroy the simultaneous or previous action of the foreign pollen. So again if the pollen of several varieties, including the plant's own pollen, be placed on the stigma, one or more of the varieties will take the lead and obliterate the effect of the others: but I have not space here to give the facts on which this conclusion is grounded. Hence we may infer as highly probable that, in *Primula*, the heteromorphic pollen which we know to be so much the most effective would obliterate the action of the homomorphic pollen when left on the flower's own stigma by insects; and thus we see how potent the dimorphic condition of the pollen in *Primula* will be in favouring the intercrossing of distinct individuals. The two forms, though both sexes are present in each, are in fact dioicous or unisexual. Whatever advantage there may be in the separation of the sexes, towards which we see so frequent a tendency throughout nature, this advantage has been here so far gained, that the one form is fertilized by the other, and conversely; and this is effected by the pollen of each form having less potency than that of the other on its own stigma.

Bearing on this view of the final cause of the dimorphism of the *Primulas*, there is another curious point. If we look at the right-hand figures of the four first lines in the previous tables of *P. Sinensis* and *veris*, we shall see that one of the homomorphic unions, namely, the short-styled by its own-form pollen, is considerably more sterile than the other; and in *P. auricula*, though here there is no other homomorphic union as a standard of comparison, this union is likewise excessively sterile. That the fertility of this union is really less in a marked degree than in the other three unions, we have an independent proof in the seeds germinating less perfectly and much more slowly than those from the other unions.

This fact is the more remarkable, because we have clearly seen that the short-styled form in the Cowslip in a state of nature is the most productive of seed. This form bears its anthers close together at the mouth of the corolla, and I observed long before I had ascertained the relative fertility of the four unions, in passing the proboscis of a dead Humble-bee or bristle down the the corolla, that in this form the flower's own pollen was almost certain to be left on its own stigma; and, as I wrote down at the time, the chance of self-fertilization is much stronger in this than in the other form. On this view we can at once understand the good of the pollen of the short-styled form, relatively to its own stigma, being the most sterile; for this sterility would be the most requisite to check self-fertilization, or to favour intercrossing. Hence, also, it would appear that there are four grades of fertility from the four possible unions in *Primula*; of the two homomorphic unions, as we have just seen, one is considerably more sterile than the other. In the wild state we know that the short-styled plants are more fertile than the long-styled; and we may infer as almost certain, that in the wild state, when the flowers are visited by insects, as is absolutely necessary for the production of seed, and when pollen is freely carried from one form to the other, that the unions are heteromorphic; if so, there are two degrees of fertility in the heteromorphic unions, making altogether four grades of fertility.

Two or three other points deserve a passing notice. The question whether the Primrose and Cowslip (*P. vulgaris* and *veris*) are distinct species or varieties has been more disputed and experimented on than in any other plant. But as we now know that the visits of insects are indispensable to the fertilization of these plants, and that in all probability the heteromorphic pollen of a Primrose would be prepotent on the stigma of a Cowslip over the homomorphic pollen of a Cowslip, the numerous experiments which have been made, showing that Oxlips appear amongst the seedlings of Cowslips, cannot be trusted, as the parent plants do not appear to have been carefully protected from insects*. I am far from wishing to affirm that pure Cowslips will not produce Ox-

* Mr. Sidebotham (Phytologist, vol. iii. pp. 703-5) states that he protected his plants from crossing; but as he gives in detail all the precautions which he took, and says nothing about artificial fertilization, we may conclude that he did not fertilize his plants. As he raised very numerous seedlings, he would have had to fertilize many flowers, if they had been really well guarded against the visits of insects. Hence I conclude that his results are not worthy of trust.

lips, but further experiments are absolutely necessary. We may also suspect that the fact noticed by florists*, that the varieties of the *Polyanthus* never come true from seed, may be *in part* due to their habitually crossing with other varieties of the *Polyanthus*.

The simple fact of two individuals of the same undoubted species, when homomorphically united, being as sterile as are many distinct species when crossed, will surprise those who look at sterility as a special endowment to keep created species distinct. Hybridizers have shown† that individual plants of the same species vary in their sexual powers, so far that one individual will unite more readily than another individual of the same species with a distinct species. Seeing that we thus have a groundwork of variability in sexual power, and seeing that sterility of a peculiar kind has been acquired by the species of *Primula* to favour intercrossing, those who believe in the slow modification of specific forms will naturally ask themselves whether sterility may not have been slowly acquired for a distinct object, namely, to prevent two forms, whilst being fitted for distinct lines of life, becoming blended by marriage, and thus less well adapted for their new habits of life. But many great difficulties would remain, even if this view could be maintained.

Whether or not the dimorphic condition of the *Primulæ* has any bearing on other points in natural history, it is valuable as showing how nature strives, if I may so express myself, to favour the sexual union of distinct individuals of the same species. The resources of nature are illimitable; and we know not why the species of *Primula* should have acquired this novel and curious aid for checking continued self-fertilization through the division of the individuals into two bodies of hermaphrodites with different sexual powers, instead of by the more common method of the separation of the sexes, or by the maturity of the male and female elements at different periods, or by other such contrivances. Nor do we know why nature should thus strive after the intercrossing of distinct individuals. We do not even in the least know the final cause of sexuality; why new beings should be produced by the union of the two sexual elements, instead of by a process of parthenogenesis. When we look to the state in which young mammals and birds are born, we can at least see that the object gained is

* Mr. D. Beaton, in 'Journal of Horticulture,' May 28, 1861, pp. 154, 244.

† Gärtner, Bastarderzeugung, s. 165.

not, as has sometimes been maintained, mere dissemination. The whole subject is as yet hidden in darkness.

I will now only add that cases of dimorphism, like that of *Primula*, seem to be far from rare in the vegetable kingdom, though they have been little attended to. A large and important class of analogous facts will probably soon be discovered. Professor Asa Gray* informs me, that he and Dr. Torrey have described several Rubiaceous genera, in which some plants have exerted stamens, and others exerted pistils. "Mitchella offers an interesting instance of this structure from its relationship, through *Nertera*, to *Coprosma*, one of the few dioecious genera of *Rubiaceæ*, and in which the stamens are elongated in the male flowers and the styles in the females." The long-styled hermaphrodite flowers of *Mitchella* would probably be found more productive of seed than the short-styled; in the same way, but in a reversed manner, as in *Primula*, the short-styled flowers are more productive than the long-styled; from which fact I inferred that, if *Primula* were to become dioecious, the females would have short pistils and the males short stamens, these being the corresponding organs necessary for a heteromorphic union with full fertility. In the dioecious *Coprosma*, on the other hand, the females have long pistils, and the males have long stamens. These facts probably show us the stages by which a dioecious condition has been acquired by many plants.

Prof. A. Gray also informs me that another Rubiaceous genus (*Knoxia*) in India has been described by Dr. Wight, with a similar structure; and this, I am told, is the case with *Cinchona*. Several species of North American *Plantago* are dimorphic, as is *Rhamnus lanceolatus*, as far as its female organs are concerned. In the *Boragineæ*, Dr. Torrey has observed a strongly marked instance in *Amsinckia spectabilis*: in some dried flowers sent me by Prof. Gray, I find that the pistil in the one form is more than twice as long as in the other, with a corresponding difference in the length of the stamens; in the short-styled flowers the grains of pollen, as in *Primula*, apparently are larger, in the proportion of nine to seven, than in the long-styled flowers, which have the short stamens; but the difference can hardly be determined with safety in dried flowers. In *Mertensia alpina*, another member of

* See also Prof. Asa Gray's 'Manual of the Botany of the N. United States,' 1856, p. 171. For *Plantago*, see p. 269.

the *Boragineæ*, Prof. Gray finds a new and inexplicable case,—namely, some specimens with the stamens and pistil sub-exserted, and other specimens with *both* organs seated low down the tube of the corolla. Dr. Torrey and Prof. Gray have designated all such plants as “diœciously dimorphous.” In the *Labiataë*, Mr. Bentham informs me that several species of *Ægiphyla*, and some of *Mentha*, are dimorphic like *Primula*. The case of *Thymus* is different, as I know from my own observations; but I will not here enlarge on this genus. Again, as I hear from Mr. Bentham, numerous species of *Oxalis* are similarly dimorphic. I can add the genus *Linum*. So that we already know of species (generally several in the same genus) having distinct dimorphic individuals, as far as structure is concerned, however it may prove in function, in no less than eight natural orders.

With respect to *Linum*, I will not here enter on details, as I intend to try further experiments next summer; but I may state, that I observed many years ago two forms in *Linum flavum*, with both the pistils and stamens differing in length. In *Linum grandiflorum* there are likewise two forms which present no difference in their male organs, but the pistil and stigmatic surfaces are much longer in the one form than in the other. The short-styled form, I have good reason to believe, is highly fertile with its own pollen; whether it be more fertile with the pollen of the long-styled form, I cannot at present say. The long-styled form, on the other hand, is quite sterile with its own pollen: several plants grew in my garden, remote from the short-styled plants; their stigmas were coloured blue with their own pollen; but although they produced a vast number of flowers, they did not produce a single seed-capsule. It seemed a hopeless experiment; but I had so much confidence from my trials on *Primula*, that I put a little pollen from the short-styled plants on the stigmas (already blue with their own pollen) of twelve flowers on two of the long-styled plants. From these twelve flowers I got eight remarkably fine seed-capsules; the other flowers not producing a single capsule. The existence of plants in full health, and capable of bearing seed, on which their own pollen produces no more effect than the pollen of a plant of a different order, or than so much inorganic dust, is one of the most surprising facts which I have ever observed.

Notes on *Malvaceæ* and *Sterculiaceæ*. By GEORGE
BENTHAM, Esq., P.L.S.

[Read June 20, 1861.]

BOTANISTS appear to be unanimous in bringing together the group of orders designated by Endlicher under the name of *Columniferæ*, by Brongniart under that of *Malvoideæ*, and included by Lindley in his alliance of *Malvales*. They are characterized generally by the valvate calyx, contorted petals, monadelphous or indefinite stamens, and syncarpous ovary; and as to habit, by alternate stipulate leaves often toothed or palmately lobed, and a great tendency to stellate pubescence. The subdivision of the group, however, has been the object of much diversity of opinion. Whilst A. de St. Hilaire proposed the adoption of two orders only, *Malvaceæ* and *Tiliaceæ*, the greater number of modern botanists have admitted one or two intermediate ones, *Sterculiaceæ* and *Buettneriaceæ*; whilst others enumerate as many as nine distinct orders, *Malvaceæ*, *Bombaceæ*, *Sterculiaceæ*, *Lasiopetaleæ*, *Buettneriaceæ*, *Hermanniaceæ*, *Dombeyaceæ*, *Tiliaceæ*, and *Elæocarpeæ*. The *Tiliaceæ*, including *Elæocarpeæ*, characterized by indefinite free or nearly free stamens with 2-celled anthers, have been the subject of a previous paper (*Linn. Journ.* v. 2nd Suppl.). I have now to offer a few observations on the *Malvaceæ* as understood by St. Hilaire, characterized by monadelphous stamens, or, in the very few cases where they are free, definite and alternate with the sepals.

There is so much intercommunity, both in habit and character, in the various orders or tribes of this group, that the proposal for their union, although not generally adopted, was perhaps the most in conformity to the general principles of the natural method; yet there is one character, derived from the one- or two-celled anthers, which seems to divide them into two large groups, *Malvaceæ* and *Sterculiaceæ*, accurately limited (with the exception of a very few species, whose affinities are, by other characters, placed beyond doubt) and not unnatural; and this classification we propose to adopt, in common with the majority of modern botanists, although not with the usual limits. For *Bombaceæ*, usually classed as a tribe of *Sterculiaceæ*, have the one-celled anthers of *Malvaceæ*; and, in their accessory characters, their soft wood, their staminal arrangement, the cotton within the capsule of so many of them, show a nearer connexion with some of

the arborescent Hibisceæ than with any true Sterculiaceous genera. It is true that the smooth pollen-grains have been adduced as a positive character connecting them rather with Sterculiaceæ than with Malvaceæ, but its constancy is very far from being proved. The pollen has only been described in a very few genera. As far as my observation goes, it is always tuberculate or muricate in what are considered as true Malvaceæ; but so I have found it also in *Hampea*, in several Helicteroid genera, &c.; so that, in the present state of our knowledge, the pollen cannot be taken as furnishing an ordinal character.

Although the one-celled anthers are thus taken by common consent as the essential characters of Malvaceæ, on account of its remarkable constancy in genera otherwise related, yet it is of very little organic importance. It is not occasioned by the constant abortion of one cell, but by the two cells, placed end to end as in many distinctly two-celled genera, but confluent from a very early period. In many genera no trace of any transverse partition or even contraction can, I believe, be traced at any age; in others, in the young bud, there is a distinct contraction in the middle of the anther, showing its normal structure. *Helicteres*, which on many accounts belongs undoubtedly to Sterculiaceæ, shows, in regard to the anthers, the passage from the Malvaceous confluent anthers of *H. pentandra*, &c., to the Sterculiaceous distinctly two-celled ones of *H. angustifolia*, &c.; but here the contraction in the young anthers may, I believe, be found in all the species.

MALVACEÆ have been distributed into tribes, and the genera circumscribed with so much tact and ability by A. Gray, that I have little to propose in modification of his arrangement, except the addition of one or two genera which had not come under his observation, and the annexation of Bombaceæ,—in consequence of which I should propose reducing some of his tribes to the rank of subtribes, as will appear in the following enumeration of tribes and genera.

Tribus I. MALVEÆ. Columna staminea apice v. usque ad apicem antherifera. Styli rami tot quot ovarii loculi v. carpella. Carpella matura ab axi v. receptaculo secedentia (exceptis *Bastardia* et *Howittia*).

Subtribus 1. MALOPEÆ. Carpella inordinate congesta. Ovula solitaria, adscendentia.

* *Styli rami longitudinaliter stigmatosi.*

Genus :—1. Malope, *Linn.*

** *Styli rami apice stigmatosi.*

Genera:—2. *Kitaibelia*, Willd. ; 3. *Palava*, Cav.

Subtribus 2. EUMALVEÆ. Carpella simplici serie verticillata. Ovula solitaria, adscendentia.

* *Styli rami intus longitudinaliter stigmatosi.*

Genera:—4. *Althæa*, Cav. ; 5. *Lavatera*, Linn. (*Stegia*, Mœnch ; *Saviniona*, Webb ; *Navæa*, Webb) ; 6. *Malva*, Linn. (ex parte) ; 7. *Callirhoe*, Nutt. ; 8. *Sidalcea*, A. Gray ; 9. *Napæa*, Linn.

** *Styli rami apice stigmatosi.*

Genus:—10. *Malvastrum*, A. Gray.

Subtribus 3. SIDÆÆ. Carpella simplici serie verticillata. Ovula solitaria, pendula.

* *Styli rami intus longitudinaliter stigmatosi.*

Genus:—11. *Plagianthus*, Forst. (*Philippodendron*, Poit. ; *Asterotrichon*, Klotzsch ; *Blepharanthemum*, Klotzsch ; *Lawrenzia*, Hook. ; *Wrenciala*, A. Gray.

** *Styli rami apice stigmatosi.*

Genera:—12. *Hoheria*, A. Cunn. ; 13. *Anoda*, Cav. ; 14. *Cristaria*, Cav. ; 15. *Gaya*, H. B. & K. ; 16. *Sida*, Linn. (ex parte) (*Dictyocarpus*, Wight ; *Fleischeria*, Steud.) ; 17. *Bastardia*, H. B. & K.

Subtribus 4. ABUTILEÆ. Carpella simplici serie verticillata. Ovula 2-∞ (excepta *Wissadula divergente*), sæpius adscendentia, nunc alia pendula, alia adscendentia.

Genera:—18. *Howittia*, F. Müll. ; 19. *Kydia*, Roxb. ; 20. *Wissadula*, Medik. ; 21. *Abutilon*, Gærtn. (*Beloere*, Shuttlew. ; *Bastardiæ* sect. *Gayoides*, Endl.) ; 22. *Sphæralcea*, A. de St. Hil. (*Sphæroma*, Harv. ; *Meliphlæa*, Zucc.) ; 23. *Modiola*, Mœnch.

Tribus II. URENEÆ. Columna staminea extus antherifera, apice truncata v. 5-dentata. Styli rami numero carpellorum dupli. Carpella 5, matura ab axi v. receptaculo secedentia.

Genera:—24. *Malachra*, Linn. ; 25. *Urena*, Linn. ; 26. *Pavonia*, Cav. (*Lebretonia*, Schranck ; *Greevesia*, F. Müll. ; *Lopimia*, Nees et Mart. ; *Asterochlæna*, Garcke) ; 27. *Goethea*, Nees & Mart. ; 28. *Malvaviscus*, Dillen. (*Achania*, Sw.).

Tribus III. HIBISCEÆ. Columna staminea extus antherifera, apice truncata v. 5-dentata, v. rarissime antherifera. Stylus in ramos tot quot ovarii loculi divisus v. subinteger. Capsula loculicide dehiscens, carpellis non secedentibus.

Genera:—29. *Kosteletzkya*, Presl ; 30. *Decaschistia*, W. & Arn. ;

31. Julostyles, *Thw.*; 32. Senra, *Cav.*; 33. Hibiscus, *Linn.* (*Bombycodendron*, *Zoll.*; *Lagunæa*, *Cav.*; *Abelmoschus*, *Medik.*; *Paritium*, *A. de St. Hil.*); 34. Thespesia, *Corr.*; 35. Fugosia, *Juss.* (*Redoutea*, *Vent.*); 36. Thurberia, *A. Gray*; 37. Gossypium, *Linn.* (*Sturtia*, *R. Br.*); 38. Lagunaria, *Don.*

Tribus IV. (v. Subordo) BOMBACEÆ. Columna staminea plus minus divisa in filamenta v. ramos 5-∞, singula 2-8-antherifera, v. rarius subintegra. Stylus integer v. in ramos tot quot ovarii loculos divisus. Capsula loculicide dehiscens v. indehiscens, carpellis non v. vix rarissime secedentibus.

Subtribus 1. ADANSONIÆ. Folia digitata. Bracteolæ distinctæ v. 0.

* *Columna staminea superne in filamenta numerosa soluta.*

Genera:—39. *Adansonia*, *Linn.*; 40. *Pachira*, *Aubl.* (*Carolinaea*, *Linn. fil.*); 41. *Bombax*, *Linn.* (*Eriotheca*, *Schott*; *Salmalia*, *Schott*).

** *Columna staminea 5-fida v. 5-dentata, ramis 2-3-antheriferis.*

Genera:—42. *Eriodendron*, *DC.* (*Erione*, *Campylanthera*, et *Gossampinus*, *Schott*); 43. *Chorisia*, *H. B. & K.*

Subtribus 2. MATISIÆ. Folia simplicia palmatinervia v. saltem basi 3-nervia. Bracteolæ distinctæ v. 0.

* *Petala 5. Filamenta 1-antherifera, 5-10-adelpha v. libera.*

Genera:—44. *Hampea*, *Schlecht.*; 45. *Scleronema*, *Benth.*; 46. *Cavanillesia*, *Ruiz & Pav.* (*Pourretia*, *Willd.*, non *R. & P.*).

** *Petala 5. Antheræ secus columnam v. ejus ramos adnatæ.*

Genera:—47. *Matisia*, *Humb. & Bonpl.*; 48. *Quararibea*, *Aubl.*; 49. *Montezuma*, *DC.*; 50. *Ochroma*, *Sw.*

*** *Petala 0. Antheræ 10, lineares, per paria ramis columnæ adnatæ, antheras 5 biloculares simulantes.*

Genera:—51. *Cheirostemon*, *Humb. & Bonpl.*; 52. *Fremontia*, *Torr.*

Subtribus 3. DURIONEÆ. Folia simplicia penninervia integerrima subtus uti inflorescentiæ lepidota. Involucrum calycem cingens, demum varie fissum. Fructus muricatus.

Genera:—53. *Cullenia*, *Wight*; 54. *Durio*, *Rumph.*; 55. *Lahia*, *Hassk.*; 56. *Boschia*, *Korth.* (*Heteropyxis*, *Griff.*); 57. *Neesia*, *Blume* (*Cotylephora*, *Meisn.*).

A detailed monograph of several of the above genera, especially of those which, like *Sida*, *Abutilon*, *Pavonia*, *Hibiscus*, &c., contain numerous widely spread species, is much wanted, but would lead me too far on the present occasion; nor can I stay to investigate or describe many apparently unpublished forms which we possess in our herbaria. There are, however, a few genera on which I should wish to add some observations, or to characterize some of the more remarkable new species.

PALAVA, *Cav.*

The *P. rhombifolia*, Grah., from Lima, is probably the same species as the *P. malvifolia*, Cav., of which the latter author had probably only examined undeveloped flowers, and thus described the petals as of the length of the calyx. *P. moschata*, Cav., is a very distinct species; and the following one, with the habit of a *Cristaria*, appears to have been hitherto overlooked.

P. DISSECTA, sp. n., tomentosa, foliis profunde bipinnatifidis dissectisve, lobis cuneato-oblongis obtusis integris v. 3-5-lobis, pedunculis calycibusque hispidis.

Hab. Peru, *Cuming*, n. 945; near S. Lorenzo, *Macleay*.

MALVA, *Linn.*

This genus, stripped as it has been by A. Gray of its American and South-African species, becomes at once more natural and better characterized. Amongst European ones, the *M. Sherardiana*, Linn., notwithstanding the almost constant presence of two small bracts, must be referred to *Sida*, of which it has the styles and the seeds. *M. Behriana*, Schlecht., Linnæa, xx. p. 633, from Australia, is *Lavatera plebeia*, Br.

PLAGIANTHUS, *Forst.*

Notwithstanding the close proximity of this Australian genus to *Sida*, most of the species have, under various names, been published as Sterculiaceous genera; for the longitudinal partition in the anthers (much more prominent than in the generality of Malvaceæ) has usually suggested the idea of their being really bilocular. In some species also the ovary is reduced to three, two, or even a single carpel, so as, at least in the latter case, to give readily a false idea of its structure; and one such species, very nearly allied to the original one of Forster, has even been considered as the type of a distinct natural order under the name of *Philippodendrea*, the affinities of which have much puzzled those who only knew

the plant from Poiret's figure and description. The true position of the group among Malvaceæ has now, however, been fully shown by Hooker, A. Gray, Garcke, and others, where, with the ovary and seeds of *Sida*, it is distinguished from the other genera of that subtribe by the styles either clavate or acute, stigmatic along their inner edge or surface as in most Malveæ.

Two genera have been generally distinguished—*Plagianthus* and *Lawrencia*; but the characters which separate them appear to be too inconstant and too little in conformity with habit to be considered as more than sectional. The ovary in *Plagianthus* consists usually of only one or two carpels, but sometimes of three; whilst in *Lawrencia*, although usually five, there are occasionally three only. The more or less clavate or attenuate styles vary also from species to species. The 5-angular calyx of *Lawrencia* is more constant, but even that is not always well marked; and in habit the smaller-leaved *Lawrencias* are much nearer to some of the *Plagianthi* than to *L. spicata*. I should therefore propose to include the whole of the following species in *Plagianthus*.

Sect. 1. PLAGIANTHUS. Calyx campanulatus angulis vix prominulis.

* *Styli apice valde dilatati. Carpella vulgo 1-2, rarius 3.*

1. *P. betulinus*, A. Cunn. Hook. fil. Fl. N. Zel. i. 29.—*P. urticinus*, A. Cunn.—*Philippodendron regium*, Poir. in Ann. Sc. Nat. Par. sér. 2. viii. p. 183, t. 3.—New Zealand.
2. *P. divaricatus*, Forst.; Hook. Bot. Mag. t. 3271; Hook. fil. Fl. N. Zel. i. 29.—New Zealand.
3. *P. sidoides*, Hook. Bot. Mag. t. 3396.—*Sida discolor*, Hook. Journ. Bot. i. 250.—*Asterotriche sidoides*, Link, Klotzsch et Otto, Ic. Pl. Rar. t. 8.—*Plagianthus Lampenii*, Lindl. Bot. Reg. 1838, Misc. p. 22.—Tasmania.

** *Styli apice clavati. Carpella vulgo 5.*

4. *P. pulchellus*, A. Gray; Hook. fil. Fl. Tasm. i. 49, excl. var. β .—*Sida pulchella*, Bonpl.; Hook. Bot. Mag. t. 2753.—Tasmania and Victoria.

The *P. petiolaris*, Backh. MS., from Illawarra, and *Croton urticoides*, A. Cunn. MS., from the margins of Cox's and Macquarie's Rivers, appear to be the same species; but the specimens I have seen have none but male flowers. The *Sida pulchella*, Bonpl., has been described by DeCandolle as having 2-ovulate 2-aristate carpels, which is totally at variance with our plant. I have, however, ascertained (since the present paper was read), by the inspection of Bonpland's original specimens, that the reference is correct.

*** *Styli apice attenuati.* *Carpella vulgo* 5.

5. *P. tasmanicus*.—*Sida tasmanica*, Hook. fil. in Hook. Journ. Bot. ii. 412.—*P. pulchellus*, var. β , Hook. fil. Fl. Tasm. i. 49.—Tasmania; also Southern Australia, on the rivers Tambo and Buchan, *F. Müller*.
6. ? *P. sp. ?*—*Sida dictyocarpa*, Ferd. Müll. MS.—*Sida spicata*, Backh. MS., non Cav.—On the Brisbane River, *Fraser*, *F. Müller*; Kirkton on the Upper Hunter River, *Backhouse*.

The foliage, indumentum, and inflorescence are those of *P. sidoides*, but the flowers are more crowded and sessile. Calyx shorter, broadly campanulate. Carpels usually five, strongly reticulate. A very distinct species; but the specimens are insufficient to assign its exact place.

**** *Styli superne subclavati.* *Carpella* ∞ , *matura membranacea, valde compressa.*

7. *P. Lyallii*, Hook. fil. MS.—*Hoheria Lyallii*, Hook. fil. Fl. N. Zel. i. 31, t. 11.—N. Zealand.

This plant appears to me to be much better placed in *Plagi-anthus* than in *Hoheria*, reducing the latter genus to the single *H. populnea*, which has terminal peltate stigmas and remarkably winged carpels.

Sect. 2. LAWRENCIA. Calyx 5-angulatus, sæpe turbinatus. Styli apice attenuati. *Carpella* 3–5, nonnulla sæpe abortientia.

8. *P. spicatus*.—*Lawrencia spicata*, Hook. Ic. Pl. t. 261, 262.—Tasmania and Southern and Western Australia, from Port Fairy to Swan River.
9. *P. glomeratus*.—*Lawrencia glomerata*, Hook. Ic. Pl. t. 417.—Swan River, *Drummond*.
10. *P. squamatus*.—*Lawrencia squamata*, Nees, Pl. Preiss. i. 242.—Swan River, *Preiss*; *Drummond*, 4th coll. n. 106.
11. *P. microphyllus*, *F. Müll.* Fragm. Phyt. Austr. i. 29.—Victoria, *F. Müller*; Swan River, *Drummond*, coll. 1845, n. 208, and 4th coll. n. 252.

SIDA, Linn.

Dictyocarpus, Wight, has already been restored to this genus; and *Fleischeria*, Steud. (*Steetz* in *Pl. Preiss.* ii. 365), consisting of the single *Sida calyxhymenia*, Gay (*DC. Prod.* i. 462), only differs from other species in the calyx more enlarged, spreading and membranous after flowering—a character which appears to us wholly insufficient to justify the establishing a monotypic genus.

BASTARDIA, *H. B. & K.*, and HOWITTIA, *F. Müll.*

These two genera differ from the whole tribe of Malvæ in their capsule truly loculicidal as in Hibisceæ, without any tendency to the septicidal separation so universal in other Malvæ. Yet the habit and the staminal column are so completely those of *Sida* and its allies, that they are better placed in their vicinity as exceptional genera, than removed to Hibisceæ, with which they have little else in common. *Bastardia* must, of course, be reduced, as proposed by Grisebach and others, to the two original species, *B. viscosa* and *B. bivalvis*, Kunth. The *B. crispa*, St. Hil., and *B. nemoralis*, St. Hil., have several ovules in each carpel, although most frequently only one comes to maturity. They form the section *Gayopsis* of *Abutilon*, a section including *A. asiaticum*, Don, &c., and proposed by Shuttleworth to be raised to the rank of a genus, under the name of *Beloere*.

WISSADULA, *Medik.*

This small genus, closely allied to *Abutilon*, is adopted by A. Gray and others on account of the transverse projection inside each carpel dividing it into two cells, analogous to the inner appendages which form the character separating *Callirhoe* from *Malva*, and *Modiola* from *Sphæralcea*. It should, however, include, as proposed by Planchon, the *Sida divergens*, Benth., notwithstanding the want of any ovule in the upper portion of the carpels, the lower portion containing a single one. Grisebach on this account retains it as a section of *Sida*, under the name of *Wissada*; but, besides the rudimentary transverse dissepiment and the habit, which separate it from *Sida* and bring it under *Wissadula*, the shape of the fruit indicates its connexion with the latter, and not with the former. In all *Sidas* the upper angle is on the inner edge next the axis, so that when lengthened into a point or awn these points are always erect or connivent; whilst in *Wissadula*, as in most *Abutilons*, the upper angles or points are more or less divergent or divaricate, giving a peculiar flat top to the fruit. In the remaining *Abutilons* (chiefly of the section *Gayopsis*) the carpels are rounded at the top, but never have the inner angles or connivent points of *Sida*.

ABUTILON, *Gærtn.*

The *A. vitifolium* (*Sida*, Cav.) and, perhaps, a few other South-Western American species differ slightly from the rest of the

genus in the more clavate branches of the style with less strictly terminal stigmas ; but, as far as I am aware, the character is scarcely sufficiently marked to form even a good section.

SPHÆRALCEA, *A. de St. Hil.*

Harvey proposes to distinguish under the name of *Sphæroma* two species which differ from the others, as *Lavatera* from *Malva*, by the bracts connate at the base, and which has appeared in the Cape species to be confirmed by a difference in habit. But when the American species come to be examined, it will be found that the free and connate bracts pass gradually the one into the other, without any relation to habit or other characters. As to the rule that if a character separates two good genera in one part of a natural order, it must be considered as generic throughout the order, it is a very unsafe one, and the attempted strict adherence to it has been one of the causes of the raising so enormous a number of isolated species to bad genera, and of the consequent confusion, in Cruciferæ, Umbelliferæ, Compositæ, &c.

Meliphlœa, Zucc., a single Mexican species, has been distinguished from *Sphæralcea* by its connate bracts, by the calyx marked inside at the base by a smooth five-lobed portion scarcely thickened enough to be called a disk, and by clavate styles with the stigmas less strictly terminal ; but all these characters may be observed, although in a much less degree, in other species passing gradually into the typical form. It is probable, however, that, when better known, the red-flowered species, such as *S. umbellata*, *S. rosea*, &c., may, with Zuccarini's *Meliphlœa*, form a good section of *Sphæralcea*, whilst *Sphæroma* would constitute a third section.

URENA, *Linn.*

As no character has been found to separate this genus from *Pavonia* except the glochidiate points covering the fruit, the *U. speciosa*, Wall., must be transferred to *Pavonia*, in which many species have connate bracts.

PAVONIA, *Cav.*

There are about 60 species known of this genus, varying considerably in habit and in several minor characters derived chiefly from the bracts and the shape and degree of dehiscence of the cocci ; and it would require a careful monographic examination of the whole to determine how far the genus is divisible into good sections, and what are the limits to be assigned to it with reference to the closely allied genera *Urena*, *Goethea*, and *Malvaviscus*. *Le-*

bretonia, Schranck, with five broad bracts and indehiscent cocci (sometimes muricate almost as in *Urena*), and *Lopimia*, Nees and Mart., with numerous narrow bracts and the cocci enveloped in mucilage, have now been generally reunited with *Pavonia*, as being connected with other species by intermediate forms. An Australian variety of *P. hastata*, Cav., has been established by F. Müller as a genus under the name of *Greevesia*, as having dimorphous flowers—perfect ones with the usual petals, together with abnormal pentandrous ones with small closed corollas. This is hitherto, as far as I am aware, the only instance observed in Malvaceæ, as the *Stellarias* of the group of *Krascheninikowia* are among Caryophylleæ, but in neither case supplying a good generic character any more than in the numerous other orders where it is now known to occur.

Asterochlæna, Garcke, from the character given in the Bot. Zeit. 1850, p. 666, does not appear in any way to differ from other *Pavonias* with more or less dehiscent cocci.

Goethea, Nees et Mart., has also been united with *Pavonia*; yet, in two species known to me, the habit and inflorescence, the large coloured calyx, short corolla, &c., seem to indicate differences more important than those which separate *Urena*. The *G. semper-florens*, Mart., however, only known to me from Martius's figure, may possibly sufficiently connect *Goethea* with species of true *Pavonia* to justify the considering it as a section only.

Malvaviscus, Dillen., with erect petals and a baccate fruit, seems at first sight very different from *Pavonia*; but the former character occurs in several true *Pavonias*, and the succulence of the fruit is variable in degree in different species of *Malvaviscus*. It is, however, known only in a very few, and whether it passes or not into the slightly mucilaginous outer coating of the carpels of *Lopimia* remains to be ascertained. Another character has been pointed out, which, if true, may be important,—that is, that the carpels are said to alternate with the petals in *Malvaviscus*, and to be opposite them in *Pavonia*. I have been unable to verify this character satisfactorily in our dried specimens. It is only in the fresh flower that it can be ascertained whether it may not be due to a greater or less degree of torsion, to which there is a tendency in many Malvaceæ.

JULOSTYLES, Thw.

This is a Ceylon tree, which, from some general resemblance in calyx and in habit to *Kydia*, had been published by Gardner as a second species of that genus. Thwaites very properly established

it as distinct on numerous grounds, and pointed out the truly Malvaceous character of its anthers. As the structure of the staminal column is also Malvaceous (except that the stamens appear to be limited to ten), as the pollen is remarkably muricate, and as the shape of the corolla with the dark spot at the base of the petals is so much like that of *Hibiscus*, there appears no reason against removing it to the tribe Hibisceæ of Malvaceæ, of which it has all the technical characters. The original species of *Kydia* must also be removed to Malvaceæ, as having truly one-celled anthers; but their shape, as well as the general structure of the staminal column, places the genus in Abutileæ rather than in Hibisceæ.

HIBISCUS, *Linn.*

This, the largest genus among Malvaceæ, comprising about 150 known species, varies more than any other in the calyx and bracts, in the woolly or glabrous seeds, &c.; but the characters appear to us to be too much blended together, or to pass too much one into the other in many instances, to be considered as more than sectional. We would therefore restore to *Hibiscus* the proposed genera *Bombycodendron*, Zoll. (sect. *Bombycella*, DC.), *Lagunæa*, Cav., *Paritium*, A. de St. Hil., and even *Abelmoschus*, Medik. On the other hand, *Thespesia*, Corr., appears to be sufficiently distinct in the calyx, in the clavate style, and in the hard, almost woody fruit, although not always indehiscent even in *T. populnea*, as well as in the apparently constant character of the obovoid, not reniform, seeds: the genus should, however, include the *H. Lampas* and its allies, forming Garcke's subsection *Tiparium* of DeCandolle's section *Azanza*.

Tribe BOMBACEÆ.

I have already given the principal reasons for which I should consider the Bombaceæ as a tribe or suborder rather of Malvaceæ than of Sterculiaceæ, and have observed that it is chiefly with the arborescent Hibisceæ that they stand in close connexion. *Hampea*, indeed, and some allied genera are scarcely separated from them, except by the filaments all terminating the staminal column without any barren truncate or 5-toothed edge; and the latter character is not even quite constant in Hibisceæ, for in some species of *Lagunaria* and *Gossypium* the column is divided to the summit into antheriferous filaments. Some genera of Bombaceæ present indeed exceptional characters, never or seldom observed

either in other Malvaceæ or in Sterculiaceæ; but these are generally limited to a few genera only, or are too variously combined to warrant the maintenance of the group as a distinct order. Thus, the digitate leaflets of the five first genera are unknown in Malvaceæ and Tiliaceæ, and in Sterculiaceæ only occur in a very few species of *Sterculia*. The bracteoles in most Bombaceæ are small and inconspicuous, as in *Fugosia*, &c.; but in the subtribe Durionæ they are united in an involucre which is often entire, completely enclosing the young bud, and bursting irregularly as the calyx enlarges. The calyx, sometimes truncate and toothed as in *Thespesia*, &c., or more rarely 5-cleft as in most Malvaceæ and Sterculiaceæ, is more frequently entire in the young bud, splitting irregularly into three to five lobes as the flower expands. This is rare in Malvaceæ and Sterculiaceæ, but occurs in the subtribe Brownlowiæ of Tiliaceæ. In *Ochroma*, *Cheirostemon*, and *Fremontia* the generally thick calyx-lobes are more or less expanded on the sides into thinner imbricating edges, which is quite exceptional among Columniferæ. The staminal column, usually more or less Malvaceous, is in *Eriodendron*, *Chorisia*, *Cheirostemon*, and *Fremontia* exceptionally divided into five lobes, each of which usually bears two long linear parallel adnate anthers, which might easily be taken at first sight for the parallel cells of single anthers, were it not that these are occasionally three instead of two, that the two are often not strictly parallel, one being longer or inserted rather higher up than the other, and that their real nature is shown by a comparison with the more numerous but similarly adnate anthers of *Matisia*, *Quararibea*, and *Ochroma*. As a further evidence of the close connexion of Bombaceæ with Hibisceæ, I may observe that since the above was read we have received some numbers of the 'Botanische Zeitung,' in which Alefeld proposes to remove *Gossypium*, *Thespesia*, and their allies from Hibisceæ to Bombaceæ.

BOMBAX, Linn.

Bombax differs chiefly from *Pachira* in its shorter flowers and in the dense wool enveloping the seeds within the capsule. In *Pachira humilis*, Spruce, and *P. Fendleri*, Seem., the flowers are longer than is usual in *Bombax*; yet as the capsule is woolly inside as in the latter genus, these two species must be transferred to it. The small-flowered *Eriothecas* and the Indian *Salmalia*, proposed as separate genera by Schott, do not appear to be founded on any better character than the greater or less degree of union of the stamens in pairs, which is variable in the same species; and we

therefore propose their reunion with *Bombax*. Nor can we see any sufficient grounds for the adoption of *Erione*, *Campylanthera*, and *Gossampinus*, proposed by the same author for single species of *Eriodendron*.

SCLEBONEMA, *Benth.*

I give this name to a North-Brazilian plant of Mr. Spruce's, which on a hasty determination I had thought might be a new species of *Myrodia*, taken in the vague general limits usually given to the genus; but, having now more closely investigated the characters of that and other Bombaceous genera, I find that it is much more nearly connected with *Hampea*. The fruit is still unknown, but the flower presents too many points of difference to admit of its being incorporated with that or any allied genus. I therefore propose it as a new genus with the following technical character:—

SCLEBONEMA. *Char. gen.*—Calyx campanulatus, sub-5-lobus. Petala 5. Columna staminea brevis, apice divisa in filamenta ∞ (circa 20) superne incrassata, exterioribus brevioribus. Antheræ terminales, adnatæ, breves, uniloculares. Ovarium 2-3-loculare, ovulis in loculis geminis collateraliter ascendentibus. Stylus apice vix incrassatus, minute 2-3-dentatus. Fructus.....

Species unica. S. SPRUCEANA, *Benth.*—Arbor 100-pedalis, trunco 5 pedes diametro; corona patula. Stipulæ parvæ. Folia alterna, ovali-elliptica v. obovata, breviter et abrupte acuminata, 2-4-pollicaria, petiolo $\frac{1}{2}$ -1-pollicari, integerrima, coriacea, glaberrima, nitida, penninervia et basi subtrinervia, costa venisque utrinsecus primariis 6-8 obliquis subtus prominulis; venulæ transversæ, crebræ, reticulatæ. Flores haud magni, in axillis solitarii v. 2-3-ni. Pedicelli 3-4 lin. longi, crassiusculi, minute tomentelli. Bracteolæ sub calyce 2 v. 3, parvæ, calyce multo breviores. Alabastra obovoidea. Calyx apertus 3 lin. longus, fere ad medium sub-5-fidus. Petala duplo longiora, rubra, anguste oblonga, glabra, patentia, in unguem angustata. Tubus stamineus 2 lin. longus, filamenta, præsertim interiora, paullo longiora. *Hab.* In North Brazil, on the Rio Uaupès, in *Caatingas* about the cataracts of Jauaratè, where these tall trees project here and there from the mass of low trees and shrubs. R. Spruce, n. 2548. Distributed under the name of *Myrodia parviflora*.

CARPODIPTERA, *Griseb.*

This genus, established by Grisebach on a Cuban plant of Wright's, and which I had at first, following that author, placed among Bombaceæ, proves on examination to differ from all others of the family as well in its stamens and its pendulous ovules as in

its fruit and general habit. It is indeed so closely allied to *Berrya* among Tiliaceæ as only to be distinguishable from that genus by the singular, almost petaloid sessile stigmas, and we have accordingly now removed it to the latter family. Among the Kew-Garden drawings is one of a plant of unknown origin, which is evidently the same *Carpodiptera*, although there are three stigmas, instead of two as in the Cuban specimens.

QUARARIBEA, *Aubl.*

This genus is generally referred as a section to *Myrodia*, which it resembles in its fruit, although the flowers are very different. The andrœcium, with its one-celled anthers, is truly Bombaceous, near that of *Matisia*; whilst in *Myrodia* the anthers, in their two parallel or diverging cells, and in their usually definite number and arrangement, are decidedly Sterculiaceous, closely resembling those of several genera of the Helictereæ.

Subtribe DURIONEÆ.

Of the five genera forming this subtribe three are monotypic, and the two others have only two species each. They have, moreover, so much general similarity in their habit, in their scaly indumentum, in their involucre and fruit, that they might have been considered as constituting a single genus. Yet there is so much diversity in their calyx, in the presence and absence of petals, in their style, in the number of ovules, and especially in their andrœcium, that we have, for the present, thought it better to preserve the five genera as usually adopted. Two of them (*Neesia* and *Boschia*) have been occasionally placed among Tiliaceæ, from which they are readily known by their anthers.

The distinction between STERCULIACEÆ and BUETTNERIACEÆ, taken each in their general sense, although adopted by most botanists, rests on no one tangible character. In both, the number of stamens usually bears some definite ratio to that of the sepals. The supposed introrse anthers of Buettneriaceæ originated in a mistake. The "sterile stamens" of most tribes of Buettneriaceæ are the same thing as the "teeth of the staminal column" in *Helicteres* and its allies, and the degree of connation of the stamens varies in both supposed orders. In both also we meet with great diversity in the dehiscence of the fruit and in the embryo and albumen. If, however, we unite the two, rejecting only the

Bombaceæ already absorbed in Malvaceæ, we have a more definite group,—closely allied, it is true, to Malvaceæ, but readily separated by their two-celled anthers; and differing rather more from Tiliaceæ in habit, in their stamens either prominently monadelphous or definite either singly or in fascicles alternating with the sepals. In the few cases where genera with shortly monadelphous stamens have been admitted into Tiliaceæ, they may be known by their pendulous ovules with a ventral raphe, a character very frequent in Tiliaceæ, but, as I believe, unknown in Malvaceæ or Sterculiaceæ. At the same time, the large order of Sterculiaceæ thus formed, consisting of 41 genera and between 500 and 600 species, may be divided into the following seven distinct, well-marked, and for the most part natural tribes.

Tribus I. STERCULIÆ. Flores unisexuales v. polygami. Calyx sæpe coloratus. Petala 0. Antheræ 5–15 ad apicem columnæ congestæ, brevissime 5-adelphæ v. annulatæ. Carpella fructus libera.

* *Antheræ inordinate congestæ. Semina albuminosa.*

Genera:—1. *Sterculia*, Linn. (*Triphaca*, Lour.; *Ivira*, Aubl.; *Southwellia*, Salisb.; *Chichæa*, Presl, v. *Mateatia*, Vell.; *Cavallium*, Schott; *Firmiana*, Marsigl.; *Erythropsis*, Lindl.; *Brachychiton*, Schott; *Pœcilodermis*, Schott; *Trichosiphon*, Schott; *Delabechea*, Lindl.; *Pterygota*, Schott; *Hildegardia*, Schott; *Scaphium*, Schott; *Pterocymbium*, R. Br.); 2. *Tarrietia*, Blume (*Argyrodendron*, F. Müll.).

** *Antheræ uniseriatim annulatæ. Albumen 0.*

Genera:—3. *Cola*, Schott (*Courtenia*, R. Br.); 4. *Heritiera*, Ait.; 5.? *Tetradia*, R. Br.

Tribus II. HELICTERÆ. Flores hermaphroditi. Petala 5, decidua. Antheræ 5–15 ad apicem columnæ elongatæ sessiles v. stipitatæ, per 1–3 cum dentibus columnæ (raro obsoletis) v. staminodiis 5 linearibus v. ligulatis extrorsum alternantes. Cotyledones integræ.

* *Ovarium intra basin columnæ sessile. Antheræ sessiles.*

Genus:—6. *Myrodia*, Schreb. (*Lexarza*, Llav.).

** *Ovarium gynophoro columnæ adnato fultum. Antheræ sessiles. Calyx clavato-campanulatus.*

Genera:—7. *Reevesia*, Lindl.; 8. *Ungeria*, Endl.

*** *Ovarium gynophoro columnæ adnato fultum. Antheræ stipitatae. Sepala demum libera.*

Genera:—9. *Kleinhovia*, Linn.; 10. *Helicteres*, Linn. (*Methorium*, Schott; *Oudemansia*, Miq.; *Isora*, Schott; *Alicteres*, Schott; *Orthothecium*, Schott); 11. *Pterospermum*, Schreb.

Tribus III. **ERIOLENÆÆ**. Flores hermaphroditi. Petala 5, decidua. Antheræ ∞ a medio ad apicem columnæ extrorsum stipitatae. Staminodia 0.

Genus:—12. *Eriolæna*, DC. (*Wallichia*, DC.; *Microlæna*, Wall.).

Tribus IV. **DOMBEYÆÆ**. Flores hermaphroditi. Petala 5, plana, sæpius persistentia. Antheræ 10–20 v. in *Melhania* 5, ad apicem columnæ breviter cupulatae, rarius elongatae, stipitatae, loculis parallelis. Ovarium sessile. Cotyledones bifidæ.

* *Stamina 20, omnia antherifera subuniseriata.*

Genera:—13. *Ruizia*, Cav.; 14. *Astiria*, Lindl.

** *Stamina per 2–3 rarius solitaria cum staminodiis 5 alternantia.*

Genera:—15. *Dombeya*, Cav. (*Assonia*, Cav.; *Xeropetalum*, Del.; *Astrapæa*, Lindl.; *Hilsenbergia*, Boj.); 16. *Trochetia*, DC.; 17. *Pentapetes*, Linn. (*Eriorhaphæ*, Miq.); 18. *Melhania*, Forsk. (*Brotera*, Cav.; *Pentaglottis*, Wall.; *Cardiostegia*, Presl; *Vialia*, Vis.).

Tribus V. **HERMANNIÆÆ**. Flores hermaphroditi. Petala 5, marcescentia, plana. Stamina 5, basi breviter, rarius in columnam coalita. Staminodia 0 v. minute dentiformia. Cotyledones integræ.

* *Ovarii loculi ∞-ovulati. Semina reniformia, embryo curvato.*

Genera:—19. *Hermannia*, Linn. (*Trichanthera*, Ehrenb.); 20. *Mahernia*, Linn.

** *Ovarii loculi 2-ovulati. Semina obovoidea v. ellipsoidea, embryo recto.*

Genera:—21. *Physodium*, Presl; 22. *Melochia*, Linn. (*Riedleia*, Vent.; *Mougeotia*, H. B. et K.; *Anamorpha*, Karst. et Tri.; *Physocodon*, Turczan.; *Lochemia*, Arn.; *Altheria*, Thou.;

Visenia, Houtt.; *Aleurodendron*, Reinw.; *Glossospermum*, Wall.); 23. *Dicarpidium*, F. Müll.; 24. *Waltheria*, Linn. (*Asteropus*, Spreng.).

Tribus VI. BUETTNERIÆ. Flores hermaphroditi. Petala 5, basi concava, v. in cucullam unguiculatam dilatata, apice acuminata, ligulata, v. rarius nuda. Antheræ 5–15, rarius ∞ , ad sinus urceolæ v. cupulæ dentatæ v. lobatæ per 1–3, rarius per 4–5, sessiles v. stipitatæ.

* *Antheræ inter staminodia 2– ∞ .*

Genera:—25. *Glossostemon*, Desf.; 26. *Abroma*, Jacq.; 27. *Theobroma*, Linn.; 28. *Herrania*, Goud.; 29. *Guazuma*, Plum. (*Bubroma*, Schreb.; *Diuroglossum*, Turczan.).

** *Antheræ inter staminodia solitariae, nunc triloculares.*

Genera:—30. *Ayenia*, Linn. (*Cybiostigma*, Turczan.); 31. *Buettneria*, Linn. (*Pentaceros*, G. F. Mey.); 32. *Rulingia*, R. Br. (*Achilleopsis*, Turczan.); 33. *Commersonia*, Forst. (*Medusa*, Lour.).

Tribus VII. LASIOPETALEÆ. Flores hermaphroditi. Petala 0 v. squamæformia. Stamina basi leviter connata, 5 antherifera sepalis alterna, sterilia totidem v. pauciora v. 0.

* *Antheræ 2-rimosæ. Carpella matura distincta v. solitaria.*

Genera:—34. *Seringia*, Gay; 35. *Keraudrenia*, Gay.

** *Antheræ 2-rimosæ. Capsula loculicide 3–5-valvis.*

Genera:—36. *Thomasia*, Gay (*Leucothamnus*, Lindl.; *Rhynchosstemon*, Steetz); 37. *Hannafordia*, F. Müll.; 38. *Guichenotia*, Gay.

*** *Antheræ 2-porosæ. Capsula loculicide 3–5-valvis.*

Genera:—39. *Sarotes*, Lindl. (*Ditomostrophe*, Turczan.); 40. *Lasiopetalum*, Sm. (*Corethrostyles*, Endl.; *Asterochiton*, Turczan.); 41. *Lysiosepalum*, F. Müll.

STERCULIA, Linn.

This large genus presents considerable diversity in foliage, in the size, shape, and colour of the calyx, in the size, shape, consistence, and degree of dehiscence of the carpels, &c., and it is upon these characters chiefly that Schott (*Meletemata*, pp. 32 & 33) proposed the dividing it into thirteen distinct genera. Endlicher, however, considering them to be of minor importance, in his 'Genera Plantarum' reunited them all as sections of *Sterculia*, with the ex-

ception of *Pterygota*, characterized by its winged seeds. Brown has since (Pl. Jav. Rar. p. 224), with his usual perspicuity, pointed out the more important characters to be derived from the arrangement of the anthers and the structure of the seed. He reunites many of Schott's genera with *Sterculia*, but still admits ten distinct ones, including two not mentioned by Schott. Some of these are monotypic, and founded on the position of the radicle with relation to the hilum—next to it, at the opposite end, or between the two. Important, however, as similar characters are in most cases, they can yet be regarded only as artificially sectional when separating single species not otherwise distinct from the main group. In the case of *Firmiana*, the two species proposed to be generically united, as having in common the intermediate position of the radicle, are in habit and in their calyx as different from each other as any two species of the whole group. But we have no hesitation in adopting as a good genus the African *Cola* (including *Courtenia*); for there are several species at once distinguished from *Sterculia* by their anthers adnate in a single ring, and by their want of albumen, accompanied by other minor characters. *Courtenia*, with divaricate instead of parallel anther-cells, appears better considered as a section than as a genus; for neither here, nor in other Sterculiaceous genera where the same diversity occurs, does it entail any other tangible differences. *Tetradia*, Br., must also be provisionally admitted; for the fruit and seed are as yet unknown, and may present characters corroborative of those derived from the flower. But we would restore to *Sterculia*, as mere sections, *Firmiana*, *Brachychiton*, *Pterygota*, *Hildegardia*, *Scaphium*, and *Pterocymbium*; including in *Brachychiton* the *Delabechea* of Lindley, in which we find the radicle next the hilum as stated by Brown, not remote from it as described by Lindley.

TARRIETIA, Blume.

This genus, allied in most respects to *Sterculia*, has the indumentum and inflorescence of *Heritiera*, with much smaller flowers and very peculiar samaroid carpels. It includes an Australian species published by F. Müller under the name of *Argyrodendron*. The leaves are digitately compound, with five leaflets according to Blume's figure and description, three only in the specimens distributed by Miquel as Blume's species, as well as in the Australian species.

MYRODIA, Schreb.

We have already stated our reasons for excluding from *Myrodia*,

and referring to Bombaceæ, the *M. longiflora*, forming the genus *Quararibea*, Aubl., as well as the species I had provisionally named in Spruce's plants *M. breviflora*, but which I have above described under the name of *Scleronema*. On the other hand, Endlicher proves to have been correct in his suggestion that *Lexarza*, Llave, belongs to *Myrodia*. Specimens agreeing in every respect with that author's description of his *L. funebris* are in the Hookerian herbarium, from Oaxaca, *Andrieux*, n. 512, from Papantla, *Liebmann*, and from near Sonsonate in San Salvador, *Sutton Hayes*. The flowers are considerably larger than in *M. turbinata*, from which it may be thus distinguished:—

M. funebris, foliis subtus ad axillas venarum tomentoso-barbatis, pedicellis calyce brevioribus 2-3-bracteatis, antheris 25-30.—*Lexarza funebris*, Llave in Llave et Lex. Nov. Veg. Descr. fasc. ii. p. 7.

DOMBEYA, Cav.

In a paper of Dr. Planchon's in the 6th vol. of the 'Flore des Serres' (which we have been unable to procure, and which is therefore only known to us from the abstract in Walpers' 'Annales,' iv. p. 325), the genus *Dombeya* is well characterized and divided into sections; and *Xeropetalum*, Delile, is correctly included. We would also agree with him in considering the *Astrapæa viscosa*, Bot. Mag., and its allies as a section only of *Dombeya*, in which the staminal tube exceeds the ovary; but, in so doing, it does not appear possible to exclude *Hilsenbergia*, Boj., and *Astrapæa*, Lindl., which only differ in the staminal tube being still longer. Nor can we reject *Assonia*, Cav., which only differs slightly in the bracts from the smaller-flowered, short-columned species. Thus constituted, *Dombeya* forms a well-marked and natural genus of about 24 species, only separated, however, from *Ruizia* and *Astiria* by the sterile stamens or lobes of the column.

TROCHETIA, DC.

This genus, extended to its proper limits, becomes a very natural one, differing from *Dombeya* in its inflorescence and the shape of its flowers, in the more coriaceous calyx, and more numerous ovules in each cell of the ovary; from *Pentapetes* in its arborescent habit, in the calyx, and in the style more divided at the top; from *Melhania*, into which some species have been hitherto placed, it is still more distinct in habit and calyx, and in the anthers always 2, 3 or 4 between each two sterile stamens, instead of one only as in *Melhania*. The species we have seen are *T. grandiflora*, Lindl.,

with the anthers in fours between each two sterile stamens; *T. uniflora*, DC., and *T. parviflora*, Boj., with the anthers in threes; and *T. decanthera* (*Melhania decanthera*, DC.), *T. laurifolia* (*Melhania laurifolia*, Boj.), *T. erythroxyton* (*Melhania erythroxyton*, Ait.), and *T. melanoxyton* (*Melhania melanoxyton*, Ait.), all with two anthers only between each two sterile ones. All the species are from Mauritius or Madagascar, except the two last, which are from St. Helena—or rather *were*, for both are now said to be extinct. This distribution of so marked a genus over these distant islands, without any traces of it (as far as known) in the intermediate continent, may suggest some curious speculations as to the gradual extinction of ancient floras. These two St. Helena species are indeed described as pentandrous only; but I have certainly found the anthers in pairs in all the specimens I have seen, although with their short filaments united: that is, however, partially the case in some of the Mauritius species.

PENTAPETES, *Linn.*

This genus, occasionally made the receptacle of several doubtful Dombeyæ, is now reduced to the single *P. phœnicea*, Linn.; for the *P. angustifolia*, Bl., is generally admitted to be a mere variety. Miquel has indeed distinguished it as a genus under the name of *Eriorhaphæ*; but on carefully studying his description, I find every part of it (including the nerve-like plumose placenta, whence he derived his name) applicable to the common *P. phœnicea*, except, perhaps, the number of anthers, 10 only instead of 15—that is, two instead of three between each two sterile stamens. From having observed, however, that one or two anthers are wanting in some flowers of our specimens, I should suspect that the number 10 was accidental in the flower examined by Miquel.

MELHANIA, *Forsk.*

Melhania, deprived of the arborescent species referred as above to *Trochetia*, and including *Brotera*, Cav., *Pentaglottis*, Wall., *Cardiostegia*, Presl, and *Vialia*, Vis., becomes a very natural and well-defined genus, distinguished from all other Dombeyæ by the anthers solitary between each two sterile stamens, and readily known by their habit approaching that of *Serræa* among Malvaceæ rather more than that of *Hermannia*, to which it has been compared. It includes about sixteen species, dispersed over Africa and the warmer, drier regions of Southern Asia and Northern Australia.

MELOCHIA, *Linn.*

We follow A. Gray and others in referring to this genus, as sections, not only *Riedleia*, Vent., including *Mougeotia*, H.B. et K., *Lochemia*, Arn., and *Altheria*, Thou., but also *Visenia*, Houtt., to which belong *Aleurodendron*, Reinw., and *Glossospermum*, Wall. As to *Physodium*, Presl, from the fragmentary specimens of two Mexican species in the Hookerian herbarium, it appears to have a very different habit, and perhaps the very large *Physalis*-like mature calyx may suffice to keep it distinct, but it requires to be better known before the point can be decided. The recently proposed genus *Anamorpha*, Karst. et Tri., and the two species of *Physocodon*, Turczan., are all founded on the *Melochia* (*Mougeotia*) *inflata*.

GLOSSOSTEMON, *Desf.*

This is a Persian plant, not very common in our herbaria, but interesting in the structure of its andrœcium, as affording perhaps some clue to the explanation of the anomalies observed in the homology of the flowers of Sterculiaceæ with respect to the position of the stamens. We have seen that the staminal column in this Order is usually divided into a definite number of barren or antheriferous teeth or filaments, which is usually some multiple of the sepals or petals. In a very few genera (e. g. *Astiria*, and probably *Assonia*) these filaments, four times as many as the sepals, all bear anthers, and are all apparently in a single row and equidistant—an occasional occurrence in different Orders of various staminal homologies: but in the majority of Sterculiaceæ, the five innermost divisions, *always opposite the sepals*, are without anthers, and take the name of teeth or staminodia, according to their degree of development; and between them, and consequently more or less *alternate with the sepals* or opposite the petals, are 1, 2, or more sessile or stipitate anthers, always turned outwards and lying outside the staminodia in the bud. In a few genera (e. g. *Waltheria* and some *Melochias*) the staminodia almost or even totally disappear, and there remain only 5 stamens, connate in a ring or cup at the base, but each tapering into one anther-bearing filament opposite the petal, instead of alternating with it as is usually the case where the stamens and petals are isomerous. It has been attempted, especially by A. Gray, to explain this anomaly as a case of *dédoublement*; that is to say, by supposing that each stamen with its corresponding petal arises from the splitting of one homological leaf; the whole flower consisting of three whorls only, of

five leaves each, the outer one forming the calyx, the next the petals and stamens, and the inner one the carpels. But when we consider that in the whole group of Columniferæ the petals are either perfectly distinct and sometimes distant from the staminal column, or, if they adhere to it near the base, the attachment is superficial only, the vascular systems remaining perfectly distinct, and that even this attachment is wanting in those genera where *dédoublement* is most relied upon, we must have something more than mere conjecture, some strong cases of intermediate structure, to counteract the evidence of our senses, and establish in theory that two totally disconnected organs are, in fact, branches of one organ.

It is well known that the (homological) leaf is very ready to ramify laterally—in its own plane; but, as far as my experience extends, ramification in a direction at right angles to that plane, either by the production of excrescences from either surface, or by anything approaching to a splitting or separation of the two surfaces, is confined to the three following categories:—

1. The production of epidermal excrescences, such as hairs, prickles, &c., never converted into real organs.

2. Proliferation, the result of plethora or of some accidental determination of sap to particular points, resulting in abnormal foliaceous appendages, or adventitious roots and buds, which may become independent individuals, but never efficient organs of the mother-plant.

3. The production of petiolar glands, which alone can have any bearing on our present case. These glands, which I have called petiolar to distinguish them from several other bodies bearing usually the same name of glands, are not, however, strictly confined to the petiole. In most stem-leaves where they occur, there are two or a single one of them at or near the summit of the petiole or the base of the limb; but they are sometimes more numerous, irregularly placed on the petiole, rarely on some of the principal veins or in their axils, but not unfrequently on the margin of the leaf at the extremity of the principal veins; and they are usually disk-shaped, concave, or cup-shaped. In bracts they sometimes attain a size very large in proportion to the rest of the bract. In the petal they are very apt to assume the form of an entire or two-lobed scale at the base of the lamina or on the claw, sometimes as large as the rest of the petal, sometimes reduced to a mere concavity in the petal, or to a slight discoloration or alteration in the texture of its surface. In the stamen, according to

views I stated many years ago (Hook. Kew Journ. Bot. i. 358), and of which I have seen no refutation, these glands are represented by the anther-cells, the petiole by the filament and connective, and the lamina either totally abortive or represented by petaloid appendages to the connective. Keeping this theory in view, we may well conceive that a *dédoublement* of the petal may produce the inner petaloid scale of some Sapindaceæ, Violaceæ, Bixaceæ, &c., or the fimbriate scales in the tube of *Cuscuta* and other gamopetalous flowers, or the corona of *Passiflora*, the cup-shaped nectary of *Narcissus*, &c.; or, again, that a *dédoublement* of the stamens may result in the staminal corona of Asclepiadeæ when arising from the gynostegium. But that there is anything of the kind in Sterculiaceæ is, I think, fully disproved by the Buettneriæ, where this supposed formation has been most relied upon; for here the petiolar gland of the petal-leaf forms the apex of the hood, connivent over or adhering to the staminal column, and is perfectly distinct in origin and position from the anther which it so curiously encloses*.

How then are we to account for the disturbance occurring in Sterculiaceæ of the usual alternation in the staminal whorls? I find that on soaking the andrœcium in several genera, and more especially in *Glossostemon*, it separates very readily into five bodies (adelpia), normally alternating with the petals, each one ending in a point or appendage (the teeth, barren lobes, or staminodia of the staminal column), and bearing the anthers on its margin on each side of the central point. Might we not consider each such body or fascicle of stamens as one staminal leaf, with branched veins, the central vein bearing no anther (or altered gland), the lateral branches each terminating in an anther (or altered gland) corresponding to the marginal glands on the stem-leaves of several species of *Homalium*, *Ranara*, Euphorbiaceæ, &c.? Where the number of anthers between each two staminodia is an even one (2, 4, 6 or 8), the staminal leaf has the same number of anthers on each side of the central nerve; where it is an odd one (1, 3, or 5), there is one more on one side than on the other,—a circumstance readily explained by the great tendency to obliquity in the parts of the floral whorls, where the æstivation is so strongly contorted. In confirmation of this view I may also observe, that in *Melhania* I never find the anther-bearing stamen exactly opposite the centre

* The supposed lateral *dédoublement* in the staminal leaves of the inner whorl in Cruciferæ is, to my mind, equally mythical; and I hope, on an early occasion, to lay before the Society my reasons for coming to this conclusion.

of the petals, but somewhere between the margin and the mid-rib*.

If the supposition, or as some would say conjecture, that the andrœcium of most Sterculiaceæ consists of five leaves, each bearing 1, 2, or more marginal anthers, be admitted, we must, in order to account for the internal position of the terminal point and for the extrorse direction of the anthers, further suppose that the edges of the leaf are slightly revolute in æstivation, not involute or inflexed as is usually the case with staminal leaves when not valvate or open. Similar exceptions to the ordinary æstivation occur, however, in other instances. Ordinary extrorse anthers do not indeed necessarily involve such an explanation, for petiolar glands may occur on the back as well as on the front of the leaf; but in many Laurineæ for instance, where the stamens are in three or four series, there is evidently a diversity in their æstivation, those of the outer series being involute, and the inner ones revolute.

ABROMA, *Jacq.*

The so-called strophiola in this genus is not an expansion of the hilum of the seed, nor yet of each separate funiculus, but a projection of the general placenta upon which the seeds are separately attached.

A. nitida, Pœpp. et Endl., belongs to *Herrania*, as well as the *A. Maricæ*, Mart., already referred to that genus.

GUAZUMA, *Plum.*

The genus *Diuroglossum*, Turczan., described in the Moscow Bulletin, 1852, is nothing but the common *Guazuma tomentosa*.

AYENIA, *Linn.*

In this genus and in a few species of the closely allied *Buettneria*, the anthers, solitary between each two sterile stamina or teeth of the andrœcium, have three parallel cells instead of two. This seems to indicate that the anther is compound, and may admit of two solutions. Grisebach suggests that the three cells may represent the three anthers of *Guazuma*, which have divaricate but distinct cells, but that here, by their closer combination, these divaricate cells have become completely confluent, without

* Whilst suggesting the above explanation of the abnormal position of the stamens in Sterculiaceæ, I am well aware that the fact of the outer stamens being opposite the petals in Geraniaceæ and their allies must be accounted for on other grounds.

any trace of a transverse separation or contraction; and that we have thus the one-celled anthers of Malvaceæ, thereby doing away with the chief distinctive character of the two orders. I have, however, in vain searched for any species, either of *Ayenia* or *Guazuma*, showing any intermediate state between the ordinary anthers of the two genera; and in all other respects the two genera, though not inappropriately following each other in the linear series, have wide constitutional differences, in the calyx, the petals, the number of ovules, the styles, and, above all, in the embryo. On the other hand, in the great majority of *Buettnerias* the anthers have two parallel cells, which have as completely the appearance of belonging to one anther only as those of *Rulingia*; and when the third cell is present, might it not be considered as the half of an anther belonging to the adjoining staminal leaf, under the theory above suggested in explanation of the andrœcium of Sterculiaceæ? The three-celled anthers of *Ayenia* would then be explained as consisting of one complete two-celled, and one dimidiate anther.

Cybiostigma of Turczaninow is founded on the common *Ayenia magna*, L., and a closely allied species, and has nothing to separate it generically from the other species.

RULINGIA, R. Br.

Achilleopsis, Turczan. (Walp. Ann. ii. 165), does not appear to be sufficiently distinct from *Rulingia*. I do not find the stamens quite free from the base, although much more shortly united than in most *Rulingias*.

LASIOPEALEÆ.

In this tribe, entirely Australian, where the petals are wanting or rudimentary, the andrœcium may be formed on a somewhat different principle from that of the other Sterculiaceæ. The stamens of the outer whorl opposite the sepals are reduced to barren filaments or, like the petals, entirely deficient; and the five anther-bearing stamens, alternate with the sepals as in other pentandrous Sterculiaceæ, may, however, really belong to the inner staminal whorl.

The genera of this tribe have probably been too much multiplied on characters of very little importance. Even the difference in the dehiscence of the anthers, by short pores or long slits, is not always clearly marked; and although we have still availed ourselves of it as distinguishing considerable groups, these are not so

natural as could have been wished. The two first genera, *Seringia* and *Keraudrenia*, are well separated from all the others by their ripe carpels distinct or solitary, not forming a loculicidal capsule; and the two are equally well distinguished by the seeds ellipsoid with a straight embryo in *Seringia*, reniform with a curved embryo in *Keraudrenia*. The calyx and habit of the former also approach those of *Commersonia*, whilst those of *Keraudrenia* are nearer to *Thomasia* and *Lasiopetalum*. But *Seringia* must be understood as originally limited by Gay, and *S. nephrosperma*, F. Müll., transferred to *Keraudrenia*. Of the remaining six genera which we have adopted, three (*Thomasia*, *Guichenotia*, and *Hannafordia*) have the anthers opening in pores; and in three (*Sarotes*, *Lasiopetalum*, and *Lysiosepalum*) they open in slits. *Guichenotia*, *Hannafordia*, and *Sarotes* are distinguished by their calyx marked when enlarged by 3 or 5 prominent ribs on each sepal, and *Hannafordia* by the lanceolate petals much more developed than in other Lasiopetaleæ; and lastly, *Lysiosepalum*, F. Müll., which I have not seen, is said to be well marked by the sepals entirely free from the base: but all these must be admitted to be rather artificial than natural distinctions.

As to the other proposed genera, we would reduce *Leucothamnus*, Lindl., and *Rhynchostemon*, Steetz, to *Thomasia*; *Ditomostrophe*, Turczan., to *Sarotes*; and *Corethrostyles*, Endl., and *Asterochiton*, Turczan., to *Lasiopetalum*.

The apparently ternately verticillate leaves of *Guichenotia*, *Sarotes*, and some *Lasiopetala*, in which one leaf is always larger than the two others, appear to correspond to the leaf with two leaf-like stipules of other *Lasiopetala* and of *Thomasia*. In a few *Lasiopetala* the leaves appear to be really opposite, which is, I believe, the only instance in the whole Order of Sterculiaceæ.

During the ten months which have elapsed since this paper was sent in to the Society, fresh materials have accumulated, which have enabled me to make some slight improvements in the arrangement of a few genera, as well as a few additions, but not so as to interfere with the observations above given. The *Kydia axillaris* of Thwaites, now that the flower is known, proves to be a new genus allied to *Julostyles*, to which must also be referred *K. jujubifolia*, Griff. As Mr. Thwaites did not send any name with his notes, we have given it that of *Dicellostyles*, in allusion to its forked style. A Mauritius specimen, long overlooked among the unnamed ones in the Hookerian herbarium, can only be referred to a new genus,

allied on the one hand to *Dombeya* and on the other to *Trochetia*, to which we have given the name of *Cheirolæna*. And amongst Griffith's unnamed specimens we have also a new genus of Durioneæ, allied to *Boschia* and *Neesia*, remarkable for its very small flowers with a depressed circular calyx marked by five cavities at the base of its lobes, with corresponding protuberances outside, and which have suggested the name of *Cælostegia*. As the part of our 'Genera Plantarum' comprising these Orders is now in the press, it would be superfluous to repeat here the characters of these new genera.

With reference to the observations above given on the homology of the stamens of Buettneriæ, I would add that Professor Oliver, whose opinions on similar questions must always have great weight, in a paper lately read before the Society, objects to my comparison of the anther of the staminal leaf with the petiolar glands of the leaf properly so called. I freely admit that plausible arguments may be brought forward against my views; but upon a full reconsideration of the subject, I confess myself still further inclined to believe that the explanation I have suggested is likely to prove correct.

I have also to add to my former paper on Tiliaceæ, that, with reference to *Antholoma*, a cursory inspection of specimens during my visit to Paris last autumn, and the examination of a bud and flower kindly sent to me by M. Brongniart, have fully confirmed Dr. Planchon's suggestion that the genus is Tiliaceous—not far from *Elæocarpus*. It is indeed closely allied to *Sloanea*, differing chiefly in the petals united into a tubular, almost conical corolla. I understand that M. Baillon has fully described the plant in a number of his 'Recueil d'Observations' which has not yet reached us.

March 1862.

West African Tropical Orchids.

By Dr. LINDLEY, F.R.S., F.L.S., &c.

[Read November 7, 1861.]

MOST of the plants included in the following succinct enumeration have been obtained in the Expedition to the West Coast of Africa, under the command of Dr. Baikie, R.N. The larger part resulted from the investigation of the late Mr. Barter, a most zealous and skilful collector, who unfortunately fell a victim to his exertions. The remainder have been sent home by Mr. Gustav Mann, who may be fairly pronounced to be second to no one. For

the opportunity of examining and describing them, I am indebted to Sir William Hooker.

Till the present time, the species of the Order known to exist in the region over which these collections have extended, were little known; the colony of Sierra Leone having supplied the greater proportion of the 19 previously described. Those now enumerated inhabit the middle and lower course of the Niger River, the country extending from Lagos to the Cameroons, with several from Fernando Po, where, however, *Ansellia africana*, the only species before known from that island, was not seen by Mr. Mann. In all, I have examined 67 species, of which 48 were previously undescribed.

Of those bearing a well-marked resemblance to other portions of the African Flora, the principal part resemble Cape species. These are *Polystachya alpina*, near *P. Ottoniana*; *Penthea Pumilio*, a striking addition to a small Cape genus; *Angræcum arcuatum*, identical with the plant from Albany; and *Cymbidium adenoglossum*, which resembles the *C. tabulare* of Table Mountain.

Others must be compared with Eastern Africa: thus, *Amphorchis occidentalis* is the second species of a genus inhabiting the Isles of France and Bourbon; *Corymbis disticha* is the same as the plant from the same islands; *Calanthe corymbosa* is very near *C. sylvatica* of the Isle of France; *Habenaria præalta* is undistinguishable from the Bourbon species; and *Bolbophyllum lupulinum* has all the appearance of *B. occultum* from the Mauritius and Bourbon, although the structure of the flowers is widely different; finally, there is a new *Notiophrys*, near *N. occulta*, from the same islands. To these special resemblances must be added the generic similarity among many species of *Bolbophyllum*, *Polystachya*, and *Angræcum*, in Eastern and Western Africa: the collections containing 14 species of the first, the same number of the third, and 9 of the second.

Perhaps the most striking geographical fact consists in the presence of the Asiatic *Epipogon nutans* at Ambas Bay, a place a little to the north of the embouchure of the Cameroons River.

It is worthy of remark in conclusion that there is little resemblance between the species now described and those of Abyssinia; there is no *Satyrium*, no *Peristylus*, no *Pterygodium*; and the species of *Habenaria* are quite dissimilar. It is only in the case of *Eulophia guineensis*, the *Saccolabium abyssinicum* of Achille Richard, that the identity of a West African and Abyssinian plant has been ascertained.

LIPARIS, *Richard.*

1. Sp. ? in fruit only.

“On Mangroves, R. Nun.” (2122) *Barter.*

2. Sp. ? no flowers.

“Terrestrial, in a swamp. Flowers deep red. Lagos.” (2202) *Barter.*

3. *L. GUINEENSIS*? *Lindl. in Bot. Reg. vol. xx. t. 1671.*

“Flowers small, purple. Prince’s Island.” (1980) *Barter.*

The flowers are very young; but the plant would certainly be referred to *L. guineensis* were they green instead of purple.

4. Sp. ? no flowers.

“On rocks. Prince’s Island.” (2029) *Barter.*

BOLBOPHYLLUM, *Thouars.*

§ *Ptiloglossum*; labello elasticæ articulato, plumoso.

1. *B. CALAMARIUM*, *Lindl. in Bot. Reg. 1843, Misc. 109; Bot. Mag. t. 4088.*

“Flowers chocolate. Labellum fringed with long hairs. Town of Nupe.” (1482) *Barter.*

2. *B. RHIZOPHORÆ*; pseudobulbis ovatis diphyllis, foliis oblongis conduplicatis obtusis, spicis multifloris pendulis, bracteis subrotundo-ovatis reflexis margine membranaceis, rachi floribusque scabris, sepalo dorsali lineari lateralibus intus pubescentibus subrotundis cuspidatis multo longiore, petalis linearibus angustissimis glabris apice setaceis, labello lineari intus villosa sub apice mucronulato.

“On Mangroves. Flowers uniform deep purple. R. Nun.” (2118) *Barter.*

A very distinct species, with the small flowers and angular filiform rachis covered with a purple rough fur. The bracts are quite smooth.

3. *B. DISTANS*; pseudobulbis quadrangulis brevibus monophyllis, foliis loratis basi angustatis obtusis spica disticha longioribus, bracteis glumaceis distantibus, sepalis petalisque setaceo-acuminatis, labello a basi concava carinata longissime setaceo villosissimo.

“Epiphyte. Banks of the R. Nun, Sept. 1860.” (525) *Mann.*

Leaves about 6 inches long. Scape from 2 to 4 inches long, with about two tight vaginæ. Hairs of the lip apparently violet.

4. *B. COCHLEATUM*; pseudobulbis angustis teretibus diphyllis, foliis angustis obtusis, scapo plurivaginato paulo brevior, spica densa disticha bracteis cochleatis imbricatis, sepalis carnosis subæqualibus, petalis ovatis carnosis columnæ æqualibus, labello linguiformi supra carinato sepalis brevior, columnæ dentibus erectis obtusis postice emarginatis.

“Epiphyte. Fernando Po, at 4000 feet, Dec. 1860.” (643) *Mann.*

The whole inflorescence seems to be purple, and is not unlike that of *Pholidota imbricata*. The lip is unusually small in this section of the genus.

5. *B. TENUICAULE*; rhizomate filiformi reptante, pseudobulbis distantibus tenuibus diphyllis, foliis linearibus emarginatis, scapo filiformi plurivaginato, spica laxa bracteis glumaceis obtusis haud imbricatis, sepalis petalisque acutis æqualibus, his linearibus acuminatis, labello oblongo concavo obtuso, columna biseta.

“Epiphyte. Fernando Po, at 5000 feet, Dec. 1860.” (648) *Mann*.

Much like a small specimen of the next, but differing in the characters assigned to it.

6. *B. GRAVIDUM*; pseudobulbis ovatis angulatis diphyllis, foliis linearibus acutiuseculis, scapo multivaginato longiore, spica oblonga imbricata, bracteis oblongis cymbiformibus, sepalis subæqualibus carnosis canaliculatis acuminatis reflexis, petalis oblongis, labello linguiformi obtuso, columna antice ventricosa appendicibus 2 antice repandis.

“Epiphyte. Fernando Po, at 3000 feet, Dec. 1860.” (650) *Mann*.

Resembles *B. cochleatum*, but its spike stands high above the leaves, and the petals and column are quite different; the lip too is larger in proportion.

7. *B. LUPULINUM*; pseudobulbis ancipitibus oblongis diphyllis, foliis oblongis obtusis basi angustatis, scapo laxè vaginato pseudobulbo breviorè, spica oblonga multiflora bracteis maximis distichis cymbiformibus dense imbricatis nigro furfuraceis, floribus intra bracteas absconditis parce scabridis, sepalis ovatis carnosis, petalis nanis filiformibus, labello oblongo carnosò margine tenui serrato apice calloso obtuso refracto, columna mutica, anthera apice producta incrassata, polliniis 2 connatis.

“Epiphyte. Flowers dark purple. Ambas Bay, Febr. 1861.” (783) *Mann*.

In general appearance much like Du Petit Thouars' figure of *Bolbophyllum occultum*, a plant of which I have seen no specimen. They are, however, entirely different in the minute parts of fructification: *B. occultum* having the feathery lip of a Ptiloglot and the two setæ usual in *Bolbophyllum*, while in the species now described the lip is a solid fleshy plate, and the column has no setæ; moreover it has a reflexed white glandular point to the purple lip, an anther with a great fleshy apex, and a pair of oblong connate pollen-masses, all characters at variance with *B. occultum*. It is still more like *B. tetragonum* in structure, though wholly different in habit.

The pseudobulbs are thin, 3 inches long, with an imperfect third edge on one side; and the leaves 9 inches long by $1\frac{1}{2}$ inch wide.

8. *B. ELAIDUM*; repens dense cæspitosum, pseudobulbis depressis diphyllis, pedunculo setaceo unifloro foliis lineari-lanceolatis multo longiore, floribus sessilibus bibracteatis, sepalis glabris petalisque minoribus apice setaceis, labello conduplicato lineari obtuso glabro basi dilatato.

“Flowers greenish white. On oil Palms, Brass.” (1841, and 73) *Barter*.

There are two unequal diaphanous acuminate bracts beneath each flower, of which the lower is ovate, the upper linear.

9. *B. INTERTEXTUM*; rhizomate ramosissimo intricato, pseudobulbis ovatis monophyllis, foliis oblongis ovalibusque apiculatis, scapo setaceo multo longiore 2-3-floro, bracteis angustis recurvis ovario longioribus, sepalis membranaceis setaceo-acuminatis, petalis oblongis emarginatis, labello ovato obtuso carnosio sulcato glabro, columna bidentata.

“Epiphyte, green. Banks of the Nun, Sept. 1860.” (527) *Mann*.

Much like the last; but the flowers are not solitary, the leaves are not in pairs, the petals are not setaceous, nor is the lip attenuated.

10. *B. APETALUM*; pseudobulbis angulatis diphyllis foliis æqualibus, scapis setaceis foliis longioribus, spica laxa pauciflora, sepalis carnosis angustis galeatis, petalis obsoletis, labello longo angusto cuneato cucullato scabriusculo apice glabro reflexo carnosio, columna utrinque dilatata carnosia.

“Bagroo River, 1861,” *Mann*; and probably “on oil Palms, Brass.” (72) *Barter*, without flowers.

This singular little species has flowers like miniatures of *Aconitum Lycoctonum*. For petals there are only two minute rudiments, the lip resembles that of a *Polystachya*, and the column has two deep fleshy purplish cheeks.

11. *B. MICROPETALUM*; pseudobulbis angulatis diphyllis foliis lineari-bus emarginatis obtusis æqualibus, scapo setaceo foliis longiore, spica pauciflora, bracteis brevibus cucullatis, floribus subrotundis, sepalis acutis, petalis setaceis obsoletis, labello cuneato cucullato antice recurvo, columna membranacea brachiis truncatis denticulatis.

“Epiphyte. Fernando Po, at 4000 feet, Dec. 1860.” (644) *Mann*.

In general habit like *B. intertextum*; two minute bristles are all that represent petals; the arms of the membranous column are

as if cut off by a knife. The little flowers appear to be yellow. Seems to be related to *Bolbophyllum nutans* of Du Petit Thouars.

12. *B. FALCIPETALUM*; pseudobulbis ovalibus ancipitibus diphyllis, foliis linearibus emarginatis, scapo longiore scabriusculo ad basin fere florido, bracteis ovatis semiamplexicaulibus refractis, sepalis acutis dorsali latiore, petalis columnæ pedem decurrentibus linearibus falcatis, labello obtuse hastato basi concavo 3-lineato, columnæ angulis incurvis.

“Epiphyte, yellow. Banks of the Nun, Sept. 1860.” (526) *Mann*.

The narrow sickle-shaped petals curve forwards over the lip, like a pair of sharp horns.

13. *B. PAVIMENTATUM*; pseudobulbis densissimis subrotundo-oblongis compressis monophyllis, foliis oblongis planis pedicellatis, scapo foliis longiore filiformi erecto arcte 4-vaginato, spica densa, floribus carnosis glabris bracteis obtusis longioribus, sepalis ovatis acuminatis obtusis, petalis ovatis retusis, labello brevi carnosio tomentoso obtuse acuminato revoluto, columna biseta.

“Epiphyte. Calyx green, corolla purple. Banks of the Nun, Sept. 1860.” (519) *Mann*.

The ground is closely paved with the pseudobulbs of this species, which may be compared with such as *cupreum* or *recurvum*.

14. *B. COMATUM*; pseudobulbis ovatis angulatis monophyllis, foliis papyraceis spathulatis acuminatis, scapo pseudobulbis duplo longiore laxè vaginato, spica oblonga densissima villosissima, sepalis acuminatis, petalis subrhombis acutis labelloque oblongo obtuso canaliculato scabridis, columnæ brachiis erectis linearibus retusis.

“Epiphyte. Fernando Po, at 2000 feet, Dec. 1860.” (642) *Mann*.

A very singular species, little like any other. The heads of flowers are from an inch to 1½ inch long, so entangled with hairs as to resemble a mass of wool.

MEGACLINIUM, *Lindley*.

1. *M. OXYPTERUM*, *Lindl. in Bot. Reg. 1839, Misc. 10*.

“Flowers yellow. Prince’s Island.” (2026) *Barter*.

The leaf is broader and more oval than in the cultivated plant.

2. *M. PURPURATUM*; folio solitario oblongo, rachi angusta obtusa cuspidata crenata, bracteis oblongis apiculatis margine revolutis, sepalis aristatis dorsali fornicato, petalis setaceis, labello ovato-lineari basi denticulato.

“Flowers and whole spike purple. Brass.” (1854) *Barter*.

CALANTHE, *R. Brown.*

1. *C. CORYMBOSA* (§ *Eucalanthe B.*); foliis latis 5-nerviis acuminatis basi longe angustatis subtus pilosiusculis, corymbo denso tomentoso, bracteis lineari-lanceolatis ovarii longioribus, labello cuneato bilobo apiculo interjecto apice utrinque truncato dentato basi verrucoso dente parvo porrecto utrinque, calcare filiformi arcuato.

“Herbaceous, 1½ foot high. Corolla white and purple; at 5000 feet, on Fernando Po, Dec. 1860.” (392) *Mann.*

An ally of *C. sylvatica* and *natalensis*, from which its dense corymbose inflorescence distinguishes it, exclusive of other important marks. The leaves are 4 inches broad.

POLYSTACHYA, *Hooker.*

1. *P. ENSIFOLIA*; caule flexuoso compresso, foliis ensiformibus supremo spica simplici longiore, bracteis subulatis, floribus glabris, sepalis lateralibus triangulis carinatis, labello oblongo lævi hastato: lobis basilaribus linearibus acutis nanis.

“Flowers yellow.” Prince’s Island (1986) *Barter.*

This has much the habit of *Epidendrum armeniacum* (Pöppig’s *Encyclia macrostachya*), except that the spike is shorter and thinner. I do not find the usual pulverulent surface upon the face of the labellum.

2. *P. BIFIDA*; caule stricto gracili, foliis ensiformibus acute bifidis, racemo simplici laxo glabro paucifloro, sepalis obtusis, petalis linearibus, labello sessili carnosio angusto obtuse trifido concavo pulvinare basilari oblongo apice unituberculato.

“Epiphyte, 4000 feet, Fernando Po, Dec. 1860.” (649) *Mann.*

This too has the habit of *Epidendrum armeniacum*. From *P. ensifolia* it differs in its much narrower sharply bifid leaves, its loose raceme, blunt sepals, and wholly dissimilar lip, the cushion of which is furnished at the point with a distinct downy tubercle.

3. *P. LAXIFLORA*; foliis oblongis basi angustatis, panicula patentissima racemosa pubescente, sepalis pubescentibus petalisque linearibus acutis, labello brevi unguiculato lamina rotunda cordata acute tridentata pulvinare lineari secus unguem.

“Epiphyte, a foot high, Fernando Po, June 1860.” (437) *Mann.*—

“Flowers pale yellow. On Mangroves. R. Nun.” (2126) *Barter.*

This is one of the larger species, with spreading panicles of racemose flowers, in which respect it greatly resembles *P. puberula*. Its flowers are more than twice as large, and the lip has a long

narrow unguis, to the middle of which the cushion is confined; the lamina of the lip too is nearly circular, with three short sharp teeth. The fruit is $1\frac{1}{2}$ " long, clavate, with projecting ribs. It flowered in May 1861 in the Royal Botanic Garden, Kew.

4. *P. ODORATA*; foliis oblongo-lanceolatis membranaceis, spica paniculata pubescente ramulosa, bracteis subulatis, sepalis setaceo-apiculatis, labello cuneato trilobo unguiculato: lobis lateralibus falcatis obtusis intermedio rotundato, ungue carinato farinaceo.

"Flowers white, fragrant." Onitscha. (1483) *Barter*.—Fernando Po, June 1860. (436) *Mann*.

Differs from *P. ramulosa* in its larger downy flowers and in the form of the lip; from *P. puberula* also in the form of the lip; and from both in having a deep keel in the middle of the unguis.

5. *P. TESSELLATA*; foliis oblongo-lanceolatis pergameneis panicula stricta decomposita glabriuscula gracili ramulosa multo brevioribus, bracteis subulatis, sepalis acutis, labello cuneato unguiculato trilobo: lobis lateralibus falcatis obtusis intermedio subrhombeo emarginato ungue pubescente semicarinato.

"Mouth of the Nun River, left bank, Aug. 1860." (—) *Mann*. Also "from the Cameroons," *Id.*; but no specimen from that locality has been seen by me.

This is much like a very large form of *P. odorata*, and possibly may hereafter prove to be nothing more. It is, however, a much stouter plant, with thicker and blunter leaves, and a tall erect cane-like stem with tier upon tier of fascicles of many-flowered dense spikes; there is little pubescence on the flowers, which are smaller and appear as if tessellated when viewed by transmitted light; the middle lobe of the lip is rather different in form, and the keel in the middle of the unguis is shorter and more undefined.

6. *P. PYRAMIDALIS*; foliis lanceolatis acuminatissimis, spica composita pyramidali densissima puberula, bracteis cucullatis acutis, sepalis acutis glabriusculis, petalis linearibus, labello cuneato plano sessili obtuso apiculato basi utrinque unidentato tota facie pulverulenta.

"Epiphyte. Calyx and corolla yellow. Banks of the Nun River, Sept. 1860." (522) *Mann*.

A very striking plant, more than $1\frac{1}{2}$ foot high, with flat firm 3-5-ribbed leaves from 4 to 5 inches long. The spikes are short, dense, from 2 to 5 forming a pyramidal inflorescence.

7. *P. SETIFERA*; foliis oblongis acutis membranaceis supremo elongato spathaceo angustiore, spica subcomposita bracteis setaceis, floribus

pubescentibus, sepalis setaceo-aristatis, labello ovato acuminato membranaceo nudo utrinque unidentato.

“Flowers dull purple.” Prince’s Island. (1984) *Barter*.

Very distinct in the long setaceous points of the sepals and the thin ovate lip.

8. *P.?* *ALPINA*; subacaulis, foliis linearibus obtusis emarginatis, pedunculo hispido unifloro, flore glabro longe pileato, sepalis acutis dorsali concavo, petalis linearibus acutis, labello longe unguiculato rotundato apiculato basi appendice carnosio 6-lobo aucto unguis marginibus inflexis ciliatis.

“Epiphyte, at 6000 feet, Fernando Po, Dec. 1860.” (647) *Mann*.

The pollen of this little plant being unknown, it may be doubted whether it belongs to the genus *Polystachya*, especially since it has not the cushion characteristic of all the other certain species, but in its place a remarkably fleshy 6-lobed flat round process. It has, however, the habit of *Polystachya capensis* of Sonder (*P. Ottomiana*, Rchb. f.). I have only seen two specimens, each a few inches high, bearing one dark-red flower, with similarly red carinate bracts.

9. *P. ELASTICA*; foliis lineari-lanceolatis apice obliquis scapo subæqualibus, spatha membranacea convoluta pedunculo brevior, spica simpliciter hirta 8–10-flora stricta bracteis cucullatis apiculatis recurvis, floribus glaberrimis longe pileatis, sepalis apiculatis, petalis obovatis, labello elastice resiliente unguiculato mesochilio rhombico medio pulvinato epichilio incurvo cochleato ungue lineari carina truncata acuta aucto.

“Epiphyte. River Bagroo, April 1861.” (902) *Mann*.

Only one specimen of this curious plant has come home. It is 6 inches high, with flowers about $\frac{1}{2}$ inch long, and throws out a large mass of the thin flat roots that are so common among the leafless Angrecks. Its labellum, which is a long narrow yellow body with an inflexed concave terminal lobe, is thrown back with force when the flower expands, so as to hang down over the pileus formed by the united lateral sepals. By what mechanical contrivance this is effected I have been unable to determine.

EULOPHIA, *R. Brown*.

1. *E. GUINEENSIS*, *Lindl. in Bot. Reg. t. 686*.

“Very ornamental. Flower-stem above 3 ft. high. Sepals chocolate. Labellum light red, with darker lines.” Shady rocks; Nupe. (1485) *Barter*.

Much larger in all its parts than the garden plant. It is certain

that Achille Richard's *Saccolabium abyssinicum* is the same; the species has therefore an unusually extensive range.

2. *E. LURIDA*, *Lindl. Gen. et Sp. Orch.* p. 182; *Bot. Reg.* t. 1821.
"Flowers brownish." Brass. (2040) *Barter*.

Exactly the same as the garden plant.

3. *E. LONGICOLLIS*; foliis . . . , scapo subpaniculato bivaginato, bracteis minimis, pedicellis capillaribus, ovario acuminato, sepalis petalisque lineari-oblongis, labello saccato trilobo calvo laciniis lateralibus semi-ovatis divaricatis intermedio subrotundo multo brevioribus.
"On *Phœnix spinosa*;" R. Nun. (2121) *Barter*.

Nearly related to *Eulophia lurida*, with a similar pseudobulb clothed with coarse fibres. Scape 6 inches high, with a sheath at the base and a long flattish scale in the middle. Inflorescence as long, with a long narrow membranous bract at the base of each branch. Flowers the size of *E. lurida*. The leaves of this are unknown.

4. *E. LUTEA*; foliis . . . , scapo 4-vaginato, racemo simplici, bracteis setaceis pedicellorum longitudine, sepalis petalisque linearibus subæqualibus clausis (?), labello trilobo laciniis lateralibus obtusis subdentatis intermedia spathulata tuberculata breviora calcare recto elongato-conico, columna duplo breviora, anthera mutica.
"Flowers yellow. Grassy valleys, Nupe." (1480) *Barter*.

Leaves unknown. Scapes slender, a foot high. Racemes narrow, many-flowered. Flowers the smallest in the genus, apparently pendulous. The tubercles of the middle lobe of the lip are in about three rows; the uppermost are stalked, the lowest gradually change into minute elevations a little below the isthmus.

5. *E. VIRILIS*; foliis . . . , scapo 3-fido ad basin ramorum vaginato, bracteis setaceis deciduis, sepalis petalisque linearibus obtusis æqualibus, labello trilobo ante ostium bidentato: laciniis lateralibus triangularibus intermedio cuneato-rotundato emarginato calcare cylindræo labello adpresso, columna nana baseos lateribus prominulis pubescentibus.
"Epiphyte. Flowers yellowish red. Amba Bay, Febr. 1861." (782) *Mann*.

A small-flowered species allied to *E. lutea*, *longicollis*, and *tristis*; the spur, stiff and rising upwards till it becomes parallel with the ascending lip, is remarkable. Pollen-masses not seen.

GALEANDRA, *Lindley*.

1. *G. GRACILIS*, *Lindl. Gen. & Sp. Orch.* p. 187.—*G. extinctoria*, *Ib.*
 “Growing on the ground. R. Bagroo, April 1861.” (903) *Mann*.

Exactly like our garden plant. *G. extinctoria* was described from an imperfect specimen, and must be cancelled.

2. [*G. LONGIBRACTEATA*; scapo valido medio vaginato, racemo laxo multifloro, bracteis linearibus acuminatis ovario æqualibus, sepalis petalisque lanceolatis secundis, labello trilobo basi verrucis 2 oblongis parallelis aucto: laciniis rotundatis lateralibus planis intermedia crispa venis quinque cristatis una parva adjecta utrinque ad isthmum.

Sierra Leone, *Whitfield*.

Leaves unknown. Stem 2 feet high. Near *Galeandra euglossa*, Rehb. f., the lip of which has acute lobes, and neither warts nor crested veins.]

LISSOCHILUS, *R. Br.*

1. *L. LONGIFOLIUS*, *Bentham in Niger Flora*, p. 530.

“Flowers yellow. Stems 6 feet high, with a spongy creeping rhizome. Swamps, Nupe. (1486) *Barter*. Also Grand Bassa, *Ansell*.”

2. *L. ROSEUS*, *Lindl. in Bot. Reg.* 1843, *Misc.* 37; 1844, t. 12.

“Seven feet high, with pseudobulbous roots. Flowers reddish purple. Base of labellum streaked with orange.” Margin of a swampy ravine, Loin Nupe, (1481; also 80 with no locality) *Barter*; side of a rivulet near Pare, (3429) *Id.*

3. *L. ARENARIUS*; foliis hysternanthiis anguste ensiformibus, scapo gracili laxè vaginato, bracteis setaceo-acuminatis ovario brevioribus, sepalis lanceolatis acutis carinatis reflexis, petalis subrotundis membranaceis, labello subquadrato medio constricto sacco supra basin conico, lamellis 2 cuneatis ad ostium sacci linea elevata interjecta.

“Flowers purple. Base of labellum lined with orange. Flower-stems appear after the first rains, in April; leaves later. Tuber large and flattened.” Savannahs in a sandy soil, abundant. (1488) *Barter*.

A noble species, with the stature and appearance of *Bletia verucunda*. Petals full $\frac{3}{4}$ inch long.

4. *L. PURPURATUS*; foliis hysternanthiis, scapo stricto multifloro, bracteis setaceo-acuminatis ovarii longitudine patentissimis, sepalis oblongis acutis, petalis conformibus obtusis, labelli hypochilio rotundo epichilio angustiore repando undulato calcare brevi conico: lineis 3 tuberculatis lateralibus basi appendiculatis, anthera apiculata.

“Terrestrial; flower-spikes 3 to 4 feet high, appearing before the leaves.

Lip purple, other parts rose-colour. Tubers like kidney potatoes, in chains nearly a yard long; common about Abbeokuta." (3331) *Barter*.

A fine species, readily known by the two great processes standing on either side of the orifice of its little conical spur and terminating the two sides of three glandular lines.

CYMBIDIUM, *Swartz*.

1. *C. ADENOGLOSSUM*; foliis hysternanthiis, scapi vaginis 3 ventricosis obtusis, racemo paucifloro bracteis angustissimis linearibus, sepalis secundis basi productis cornutis petalisque minoribus lanceolatis acuminatis, labello trilobo medio carnosio striato: lobis lateralibus cuneiformibus intermedio ovato apiculato rugoso per axin serie duplici tuberculatis, columna elongata semitereti, anthera cristata.

"Nupe, 1859," *Barter*.

Nearly related to the Cape *Cymbidium tabulare*, from which its ventricose stem-sheaths and very different lip abundantly distinguish it. The two lamellæ usually found in the axis of the lip of this genus, when strictly limited, are here confluent into a raised striated ridge.

ANGRÆCUM, *Thouars*.

1. *A. SUBULATUM*, *Lindl. in Comp. Bot. Mag.* ii. 205.

"On Mangroves. R. Nun." (2125) *Barter*.

The leaves are much stouter than in the cultivated plant. Very near the *A. ornithorhynchum* of Brazil.

2. *A.?* sp.

"R. Nun." Label lost. *Barter*.

A plant with the distichous leaves of some *Dendrobium*, and small few-flowered axillary spikes. All the flowers fallen.

There is another plant in the collection also without flowers ("On Mangroves, R. Nun," 2106, *Barter*) which seems to belong to this genus. And Mann sends a third, equally indeterminable (Nun, 524).

3. *A. PELLUCIDUM*, *Lindl. in Bot. Reg.* 1844, t. 2.

"Epiphytal. Flowers yellowish white. Labellum, shining as if frosted. Brass." (37) *Barter*.—"Onitscha," (1757) *Barter*, appears to be the same in fruit.

4. *A. VESICATUM*, *Lindl. in Bot. Reg.* 1843, *Misc.* 9; folio angusto acuminato inæqualiter bilobo, spica pauciflora vaginis bracteisque membranaceis ochreatis, sepalis ovatis cuspidatis petalisque multo minoribus conformibus carnosis, labello lineari-acuminato convexo calcare incurvo

apice maximo vesicato (columna nana, anthera truncata, polliniis caudiculisque *A. pellucidi*).

“Plant of small growth. Flowers pale yellow. Assaba.” (1839)
Barter.

Flowers very fleshy. The column is short and square, like that of *A. eburneum*; but the pollen-masses and caudicles are those of *A. pellucidum*.

5. *A. TRIDENS*; subacaulis, foliis lineari-lanceolatis obtusis apice obliquis, scapo ascendente capillari distanter vaginato, racemo 3-7-floro erecto, bracteis membranaceis cucullatis, sepalis acutis dorsali recurvo, petalis ovatis acuminatis, labello concavo tripartito laciniis filiformibus, calcare pendulo apice vesicato.

“Epiphyte. Fernando Po, 4000 feet, December 1860.” (646) *Mann*.

A small species, with the aspect of a lax-flowered *Bolbophyll*. Caudicles 2, cuneate, downy. Near *A. vesicatum*.

6. *A. VAGANS*; foliis oblongo-lanceolatis setaceo-apiculatis, racemis gracilibus multifloris bracteis obsolete, floribus carnosis, sepalis petalis labelloque conformibus oblongis obtusis, calcare clavato incurvo labello longiore (caudicula lineari didyma).

“Flowers yellow, insignificant. Resembles a gigantic *Vanda*, and covers many of the small islets near the shore. Prince’s Island.” (1988)
Barter.

Leaves 8 inches long, $1\frac{3}{4}$ broad, not very thick. Racemes drooping. The flowers are the size of those of *A. vesicatum*, and very fleshy.

7. *A. PERTUSUM*, *Lindl. in Comp. Bot. Mag.* ii. 205.

“Flowers white. Brass.” (1826) *Barter*.—R. Nun. (—) *Mann*.

The lip of this species varies in being rounded and nearly entire as here, or somewhat acuminate as in the plant first described by me, or truncate and 3-toothed as in what I wrongly distinguished under the name of *A. Pescatoreanum* (*Journ. of Hort. Soc.* iv. p. 263). In the latter plant the caudicles were certainly not cup-shaped; and therefore I hesitate to adopt Prof. Reichenbach’s genus *Listrostachys*. If *Angræcum* is to be broken up, which seems to me quite unadvisable, the structure of the pollen-apparatus must be more exactly ascertained than is possible in dried specimens.

8. *A. MONODON*, *Lindl. in Paxton’s Flower Garden*, ii. p. 102. no. 373. ic. xyl. 187.

“Flowers pale yellow, insignificant. Forests between Otta and Abbeokuta, 1859.” (3352) *Barter*.

The solitary specimen is very imperfect, but seems to belong to this species.

9. *A. ARCUATUM*, *Lindl. in Companion to Botanical Magazine*, ii. 204; *Paxton's Fl. Garden*, ii. 120. no. 396. ic. xyl. 199.

"Epiphyte. Calyx and corolla white. Banks of the Nun, Sept. 1860." (521) *Mann*.

This differs in no respect from the South African plant, except in being much more luxuriant.

10. *A. CAUDATUM*, *Lindl. in Bot. Reg.* t. 1844.

"Brass." (1858) *Barter*.

11. *A. DISTICHUM*, *Lindl. in Bot. Reg.* t. 1781.

Brass." (1854) *Barter*.—"Onitscha." (1862) *Id.*—"Prince's Island." (1992) *Id.*—Banks of the Nun, Sept. 1860. (523) *Mann*.

12. *A. INFUNDIBULARE*; caule flexuoso, foliis lanceolatis obtuse et oblique bilobis, pedunculis filiformibus unifloris oppositifoliis, sepalis petalisque linearibus acuminatis, labello subrotundo-oblongo basi infundibulari in calcar incurvum filiforme pedunculo duplo longius producto.

"Flowers large, white, and fragrant. Prince's Island." (2005) *Barter*.

A beautiful species, belonging to the same set as *A. gladiifolium*, which it resembles on a large scale. The lip is about $2\frac{1}{4}$ inches long and broad; from the tip to the point of the spur it measures 6 inches. The sepals and petals are $2\frac{1}{4}$ inches long.

13. *A. ICHNEUMONEUM*; caulescens, foliis distichis late loratis coriaceis apice obliquis, spicis longissimis gracilibus recurvis, bracteis membranaceis cucullatis, floribus distantibus, sepalis petalisque acutis calcare clavato stipitato multo brevioribus, labello lineari concavo truncato tridentato.

"Epiphyte. Calyx and corolla white. Banks of the Nun, Sept. 1860." (520) *Mann*.

A very fine species. Leaves 15 inches long, and 2 broad; spikes of the same length. The flowers when unexpanded look very like some Ichneumon fly settled on the inflorescence. The two pollen-masses have each a long smooth acuminate caudicle; and two small plates stand perpendicular on either side of the orifice of the spur.

14. *A. ?* sp. No flowers.

"Prince's Island." (2019) *Barter*.

A *Vanda*-like plant, not unlike *A. caudatum*, with narrow leaves. The capsules are solitary, clavate, angular, much shorter than the recurved linear canaliculate leaves.

15. *A. IMBRICATUM*; caulescens, foliis coriaceis ovato-oblongis obtusis oblique bilobis, spicis sessilibus densis oblongis multifloris bracteis inferioribus ovatis acutis carinatis imbricatis, floribus carnosis, sepalis petalisque ovatis acutissimis, labello oblongo apiculato cucullato basi infundibulari calcare brevi obtuso uncinato, (caudicula simplici lineari, glandula recurva).

“On trees in dense masses abundant in the lower parts of the river. Flowers white, very fragrant, inconspicuous. On still nights the river resembles a close Orchid-house, in which *Cymbidium sinense* is in flower. Onitscha.” (1484) *Barter*.

Leaves about 6 inches long by $1\frac{1}{2}$ broad. Spikes $1\frac{1}{2}$ inch long.

16. *A. CAPITATUM*; acaule, foliis pergameneis loratis basi canaliculatis apice oblique dentatis, spicis sessilibus capitatis radicalibus, bracteis oblongis membranaceis obtusis, sepalis petalisque oblongo-linearibus obtusis membranaceis, labello concavo obtuso rhombeo margine crenulato calcare pendulo apice inflato ovarii longitudine, (anthera rostrata, caudiculis 2 discretis acuminatis, glandula hippocrepica).

“Flowers pale rose-coloured. Brass.” (1857) *Barter*.

The plant out of flower resembles some *Maxillaria*, such as *Baueri*. The capitate inflorescence is very remarkable.

EPIPOGUM, *Gmelin*.

1. *E. NUTANS*, *Lindl. in Journal of Linnean Society*, i. 177 (*Galera nutans*, *Blume*).

“Flowers white with purple specks, Ambas Bay, February 1861.” (784) *Mann*.

This seems to differ in nothing important from the common Indian form; the two lines of hair on the lip are, however, rudimentary only, and the lip itself is perhaps more fleshy than usual.

VANILLA, *Plumier*.

1. *V. AFRICANA*; foliis membranaceis anguste ovalibus acuminatis, spicis basi foliosis, labello trilobo infra medium intus carinato cucullato lobis lateralibus rotundatis intermedio ovato acuto ramentis quibusdam ad apicem carinae.

“On large trees. Brass.” (47) *Barter*.

A slender delicate species, formerly cultivated by Loddiges, with whom it flowered in March 1849, when I gave it the present name, under which it was dispersed.

2. *V. sp.* No flowers.

“Abundant about Angiama.” (2134) *Barter*.

I cannot identify the leaves with those of any published species.

3. *V. GRANDIFOLIA* ; folio coriaceo sessili subrotundo-oblongo venis tribus mediis contiguis, spica brevi crassa lignea.

“Epiphyte. Prince’s Island.” (1981) *Barter*.

Although only a single leaf and flowerless rachis are in the collection, they may be certainly considered evidence of the existence on Prince’s Island of a new *Vanilla* of very large size. The leaf is 7 inches long, and 5 inches broad. The remains of the spike are half as long as the leaf, and bore flowers to the base.

NOTIOPHRYS, *Lindl. in Proceedings of Linn. Soc.* vol. i. p. 189.

1. *N. GLANDULOSA* ; foliis ovalibus acutissimis, spica densa bracteis ovatis cucullatis dense glandulosis, floribus glabris, labello obovato cucullato apice lunato recurvo basi ventricoso ubi venæ in furcam apice verrucosam dividuntur.

“Terrestrial. Flowers brownish. Prince’s Island.” (1952) *Barter*.

This very distinct species exactly agrees with the generic character assigned to the other species. Its habit is quite that of *Goodyera* (*Notiophrys*) *occulta* of Thouars, but it is a much smaller species.

CORYMBIS, *Thouars*.

1. *C. DISTICHA*, *Folia Orchidacea sub Corymbi*.

“Herbaceous, 3 to 4 feet high. Flowers white. Fernando Po.” (1478) *Barter* ; (430) *Mann*.

Prof. Reichenbach (‘Bonplandia,’ 15 Feb. 1857) has referred to this plant the *Hysteria veratrifolia* of Reinwardt, and *Rhynchanthera paniculata* of Blume’s Tabellen, no. 78, the identity of which had been unsuspected in consequence of the erroneous representation of the placenta. Few Orchids have so extensive a range as this, which is found from the Gulf of Guinea to the Feejee Islands, a space of 180 degrees of longitude,—unless, indeed, the genus contains more species than one, as becomes more probable as we acquire better materials. Cuming’s plant from the Philippines, for example, seems to be distinct from that of Africa.

PENTHEA, *Lindley*.

1. *P. PUMILIO* ; caule humili laxè vaginato aphylo 1–2-floro, labello cuneato tridentato, sepalis infra apicem apiculatis petalisque ovalibus obtusis.

“River Bagroo, April 1861.” (904) *Mann*.

A very distinct little species, from 2 to 3 inches high. The flowers, which are as large as those of *P. filicornis*, seem to be orange-coloured. There is no trace of leaves.

AMPHORCHIS, *Thouars.*

1. *A. OCCIDENTALIS*; undique tomentosa, folio unico (variegato) oblongo acuto basi cucullato, scapo bivaginato, spica elongata multiflora, petalis glabris truncatis 2-3-dentatis, labello cuneato apice 3-dentato supra carinato, calcare filiformi subclavato dorsali supra labellum curvato.

“Flowers orange. Leaves marked like *Anætochilus*. But one specimen seen, in a ravine near Jeba Nupe.” (1487) *Barter*.

This species confirms Prof. Blume’s opinion (*Mus. Lugd. Bot.* ii. 190) that the genus *Amphorchis* should be distinguished from *Cynorchis*. Its peculiar character consists in the anther being inverted (not horizontal) as in so many Cape Orchids. The plant now described looks like a tomentose state of *Amphorchis calcarata*, but is totally different in its petals, lip, and spur.

HABENARIA, *W.*

1. *H. PALUDOSA*; (§ petalis labelloque integerrimis) caule gracili stricto subbifloro folioso, folio infimo lanceolato cucullato superioribus 4 distantibus sensim angustatis setaceo-acuminatis, bracteis cucullatis, sepalis lineari-lanceolatis supremo c. petalis conformibus galeatis, labello lineari-spathulato calcare lineari sepalis longiore, (anthera apiculata basibus loculorum clavatis truncatis brevior, appendice laterali setacea, processibus ovatis, rostello parvo subulato libero).

“Terrestrial. Flowers deep orange. Swamps.” Loin Nupe. (1479) *Barter*.

The habit of this is the same as that of *Bonatea pratensis*, to which genus it would be referred, if the genus *Bonatea* could be retained, which is certainly not the case. The stem is from a foot to 14 inches high.

2. *H. STENOCHILA*; (§ petalis labelloque integerrimis) caule folioso, foliis 5 oblongo-lanceolatis setaceo-acuminatis in bracteis ovario longioribus transeuntibus, spica oblonga multiflora, sepalis lateralibus semiovatis obtusis dorsali petalisque ovato-linearibus multo majoribus, labello lineari, calcare filiformi arcuato ovario duplo longiore apice bidentato, (antheræ basibus angustis ascendentibus, appendice laterali obsoleta, processibus filiformibus elongatis).

“Flowers white, fragrant. Prince’s Island.” (1995) *Barter*.

Near *H. candida*, but the leaves are broader, the petals and lip very much narrower, and the tip of the spur is not bidentate as in that species.

3. *H. MACRANDRA*; (§ petalis indivisis, labelli tripartiti laciniis lateralibus setaceis) foliis lanceolatis acutissimis petiolatis caule duplo

brevioribus, vaginis 4 sessilibus lanceolatis inferiore foliacea, racemo laxo 2- plurifloro, bracteis foliaceis acutissimis ovario longioribus, sepalis patentissimis linearibus acuminatis calcare clavato ascendente brevioribus, petalis e lata basi setaceis indivisis, labelli tripartiti laciniis omnibus setaceis, anthera linearis apiculata sepalo dorsali parum brevior.

“Herbaceous plant, 2 feet high; calyx and corolla white and green. Banks of Bonny R., Oct. 1860.” (518) *Mann*.

Leaves about 8 inches long, like those of a *Prescottia*. Scape from 7 to 9 inches high, excluding the flowers, which vary in number from two to ten. Sepals rather more than an inch long; spur 3 inches. The whole aspect of the flower is that of a *Bonatea*, without, however, the apparatus of that subgenus. The anther is very nearly as long as the dorsal sepal, a circumstance previously unknown in the genus.

4. H. PRÆALTA, *Lindl. Gen. & Sp. Orch.* p. 321.—*Satyrium præaltum*, *Thouars, Orch. Afr.* t. 11.

“Top of Clarence Peak, Fernando Po, at 10,000 feet, Dec. 1860.” (645) *Mann*.

This does not appear to differ from the Bourbon plant, as far as can be judged from the figure and from a bad specimen given me by the late Achille Richard. One of Mann's two specimens is 2 feet high, the other not quite 5 inches.

Notes on *Coutoubea volubilis*, Mart., and some other Gentianeæ of Tropical America. By Dr. A. H. R. GRISEBACH, F.M.L.S.

[Read Nov. 7, 1861.]

IN the later set of Mr. Wright's Cuba-plants there occurs a twining herbaceous Gentianeæ, which agrees (though not in all particulars of its description) with *Coutoubea volubilis*, Mart., or at least is its congener, and may be referred to it, till the comparison of authentic specimens shall settle the question whether it be specifically different: the chief discrepancy, viz. a simple raceme, in Dr. von Martius's description may be accidental. From the structure of the flower, however, the 5-partite calyx, and chiefly from the peculiar stigma and singular habit, it is evidently no true *Coutoubea*, but must form a new genus, to which (*Goeppertia*, Nees, in Laurineæ, proving identical with *Aydendron*) I wish to transfer that vacant name, as an acknowledgment due to the deserving Silesian botanist. The systematical place of *Goeppertia* would be next to *Coutoubea*, which in a certain degree it connects with

Erythræa. Its inflorescence is so far interesting, as it tends to show that the true spikes or racemes of *Coutoubea* are to be regarded as composed of cymes, reduced to a single flower, thus passing into the typical cymose inflorescence of *Gentianeæ*.

GOEPPERTIA, nov. gen.

Calyx 5-partitus, 2-bracteolatus. Corolla infundibuliformis, marcescens: limbo 5-partito. Stamina 5, e tubo corollæ exserta: filamentis brevibus infra faucem insertis: antheris erectis oblongis immutatis. Ovarium 1-loculare: stylo deciduo, stigmate indiviso ovoideo, basi in marginem prominulum producto. Capsula 2-valvis, septicida, valvulis paullo introflexis: semina reticulata, marginalia, funiculis dentiformibus inserta. Herba volubilis: folia lanceolata, paribus plerisque distantibus: cymæ 3-fidæ v. 3-chotomæ, in racemum elongatum dispositæ (aut sec. Mart., racemus simplex, terminalis).

G. VOLUBILIS, Gr. Syn. *Coutoubea*, Mart. Caulis pluripedalis, tenuis, teretiusculus, superne ramosus, internodiis mediis 3" longis; folia 1" longa, 2''' fere lata, acuminata, basi contracta vaginantia, uninervia, obscure venosa, margine sæpe revoluta; axis inflorescentiæ 6-10", internodia ejus 1-1½" longa, cymis pedunculum, calycibus pedicellum, subæquantibus, bracteis bracteolisque linearibus, his brevioribus; calyx bracteolis multo longior; segmentis lanceolatis, acuminatis, apice recurvis, margine membranaceis, tubo corollæ parum superatis; corolla habitu *Erythrææ*, "ochroleuca" (Mart.), fere ad medium divisa: tubo 2''' longo, lobis dextrorsum contortis, elliptico-oblongis, obtusis, anthera duplo longioribus; capsula ovoidea, 2''' longa.

Hab. In Cuba orientali (*Wright*, No. 1372); *C. volubilis* in Haïti (*Bertero*).

Mr. Bentham (*Hook. Journ. of Bot.* vi. p. 193) has published some emendations to my arrangement of *Gentianeæ*, and, while generally approving of his views, I take this opportunity to add a few observations. In *Coutoubea* Mr. Bentham follows Kunth in regarding *C. spicata*, Aubl., as *C. densiflora*, Mart. Indifferent figures of old authors will often remain doubtful, but in this case I still believe that Martius was quite right in separating his species; for in *Aublet's* figure the flowers are much more distant, and the leaves not contracted at the base, while in his description I find nothing which would not apply to the plant I have described under his name. Now, as my own *C. spicata* proves to be identical with *C. reflexa*, Benth., of which I now compare specimens from Guiana (*R. Schomb.* no. 1060) and from Bogota (*C. spicata* in *Goudot's Coll.*), it is evident that there is no difference in Mr.

Bentham's views on the species to be distinguished, but merely in the interpretation of Aublet's figure. In Lamarck's Illustration there is a confusion between *C. spicata* and *C. ramosa*; for his figure (t. 79) designated *C. alba*, which is a translation of Aublet's French name of his *C. spicata*, belongs to *C. ramosa*, Aubl.; but, bad as it is, this figure was by mistake quoted in the 'Prodromus' under both species.

The genus *Apophragma* I established (as was indeed not advisable) from Aublet's description and figure (t. 26. f. 2, 9, 10), exhibiting exerted stamens and a "stigmate à deux lames larges et aiguës:" at the time of its publication I wanted sufficient materials to verify this structure. But as the habit is exactly the same as in the common plant designated *Schübleria tenuifolia*, Don, (Benth.!), and identical with my own specimens of *Apophragma*, Aublet's analysis is probably erroneous: hence Bentham correctly reduced *Apophragma* to *Schübleria*. In his paper there are, however, several errors (partly typographical ones) with regard to Aublet's figures. I had not taken, as he presumed, the characters of *Apophragma* from t. 26. f. 4-7, which belong to *Schultesia*, but from f. 9, 10 (both correctly quoted by Aublet), and the "appendiculate filaments" occur in Aublet's description: f. 1, again, or *Exacum guianense*, is *Schultesia*; f. 2, *E. tenuifolium*, or *Schübleria* (Benth.).

Reichertia was separated by Karsten from *Schultesia* on account of its bidentate filaments: such a structure exists in *Sch. stenophylla* itself, the first-published species of the genus, and is evidently of no generic importance.

Erythræa, *Cicendia*, *Microcala*, *Xestæa*, and *Orthostemon* are mere artificial distinctions. From its twisted anthers, *Erythræa* might be preserved, as it is; though *E. quitensis*, Kth., during anthesis, is devoid of torsion, or shows only a single slight anfractuosity, but it is more or less twisted in the dry state afterwards. The knowledge of the species of *Erythræa*, chiefly of the American ones, is now less satisfactorily settled than at the time of my publication. Its later edition, contained in DeCandolle's 'Prodromus,' the proofs of which could not be corrected by myself, is often obscured by misprints, which may usually be improved by comparison with my monograph and the article on *Gentianeæ* in Hooker's Fl. Bor.-Amer. For instance, there was no *E. tenuifolia*, Gr., in my manuscript, this name belonging, as var. γ , to the preceding *E. linarifolia*, as was to be seen from the form of its diagnosis, though overlooked by subsequent authors. Dr. Schlecht-

tendal (Bot. Zeit. xiii. p. 915) has republished, from a Mexican periodical, Schiede's paper on two Mexican *Erythrææ*, and he describes a third considered as new by Schaffner: of these I possess two collected by Schaffner. His no. 15 (agreeing with *E. divaricata*, Schaffn.) is nothing but a broad-leaved form of the common *E. quitensis*, Kth., a species ranging from the coast of Northern Mexico (Ervendberg, no. 186!) through the mountains of Guatemala (Wendl.!) and Costa Rica (Oerst.): the original, lower form, with narrower leaves, was collected likewise in Guatemala (Wendl.!), and grows besides in Venezuela (Moritz!) and Quito (Jameson!). In the diagnosis of *E. tetramera*, Schiede, I find nothing which would prevent me from referring it to *E. quitensis*. The second species sent by Schaffner (no. 13), or *E. stricta*, Schiede, agrees with the description of *E. floribunda*, Benth. My *E. Mühlenbergii* was confined by Asa Gray to a species ranging from California to New Mexico, while he reduces the Pennsylvanian plant to the *E. ramosissima*, Pers., which he declares identical with the doubtful *Exacum pulchellum*, Pursh: this is undoubtedly a correct emendation, as Mr. Marsh found the true European species even as far south as Jamaica (probably introduced along the Atlantic with foreign grain). Among the doubtful *Erythrææ*, *E. elodes*, R. S., upon Godron's authority, is *Elodes palustris*; and to *E. Massoni*, Linn. (from an Azoric specimen) may be reduced *E. diffusa*, Woods, which is apparently indeed perennial, as stated by Lejolis, though contradicted by Grenier.

The distinction of the four remaining genera is more questionable, and I should now rather prefer regarding *Microcala* as a section of *Cicendia*; for an intermediate group of species (*Stenocala*) would be formed by *C. exaltata* and by a new Guatemalan species, discovered by Mr. Wendland, as appears from the following review of the genus.

CICENDIA.

Sect. 1. *Hippocentaurea*, Reichenb. Calyx 4-5-partitus.

1. *C. pusilla*, Gr. (Syn. *C. Candollei*, Gr.)
2. *C. Poeppigii*, Gr.
3. *C. fastigiata*, Gr.

Sect. 2. *Stenocala*. Calyx ad medium 4-fidus.

4. *C. exaltata*, Gr.
5. *C. STRICTA*, Gr. (n. sp.); caule gracili in pedunculas strictas sæpe unilaterales diviso, foliis inferioribus spathulato-lanceolatis obtusiusculis, superioribus linearibus decrescentibus, calycis lobis ovato-

lanceolatis acutis tubum ovatum æquantibus, corollæ “rubellæ” tubo exserto tenui lobis obovato-oblongis longiore, capsula ovoideo-oblonga, uniloculari: placentis intus non prominulis.

Herba spithamea, annua; folia inferiora 8''' longa, 2''' lata, internodiis longiora, superiora distantia, internodiis crescentibus ultrapollicaribus; pedunculi sæpe æquilongi cymam racemiformem a medio caule constituentes; calyx 1½'', corollæ tubus 3''' longus; antheræ ovales, incumbentes, paullo exsertæ, filamentum tenui; stylus ovario brevior, stigmatibus late capitato; capsula 3''' longa.

Hab. In Guatemala, pr. Las Nubes (*Wendl.*, mense Januar.); forma minus elongata in vulcano Frasu, Costaricæ, alt. 9000 ped. (*Wendl.*, m. April.).

Sect. 3. *Microcala*, Lk. Calyx 4-dentatus.

6. *C. filiformis*, Reichenb.

7. *C. quadrangularis*, Gr.

Of *Lisianthus*, sect. *Brachycodon*, Benth., I possess his *L. pumilus*, which proves a congener of *Pagæa*; and probably *L. ramosissimus*, Benth., is *P. Poeppigii* itself. Mr. Bentham observed the anthers to be at length recurved: hence there remain, to distinguish it from *Lisianthus*, the higher insertion of the stamens, the form of the corolla, and the very different habit. In the true *Lisianthus*, the enlargement of the connective on the back of the anther-cells is peculiar; and this character, if compared throughout the genus, may perhaps be of some value in the discrimination of *Pagæa*. In the section *Helia* (viz. in *L. brevifolius* and *L. chelonoides*), the structure of the anthers is the same as in *Chelonanthus* and *Macrocarpæa*: in both species they are at length recurved, and in the former the connective is apiculate: hence the character of *Helia* is chiefly confined to a marcescent corolla, and less peculiar than was supposed. A double placenta in each capsule-cell occurs likewise in *L. chelonoides* (a really annual species, from Kegel's specimens) and in *L. alatus*, Aubl., to which I reduce my *L. Oerstedii*. If this identification proves correct, Aublet's species must be transposed to *Helia*. *L. tetragonus* and *L. auriculatus*, Benth., have been reduced by their author to *L. acutangulus*, Bot. Mag., which is *L. trifidus*, Kth., but not *L. fistulosus*, Poir., the latter, from an authentic specimen, having purple flowers.

The sections *Chelonanthus* and *Macrocarpæa* are to be united, being only distinguished by the shrubby growth of the latter: the shape of the capsule proves of no sectional importance.

My supposition that *Symbolanthus* is little distinguished from the section *Leiothamnus* is confirmed by a beautiful *Lisianthus*

collected by Mr. Wendland in Central America, the rosy-violet flowers of which are four or five inches long. The structure of its ovary is the same as in *Lisianthus* (ovarium biloculare, placenta laminata utrinque duplici); but the plant is anomalous in the genus by having the large hypogynous ring of *Tachia*. Except in the larger size of flowers (but not so much as, from a misprint in its description, it would appear), this shrub agrees sufficiently with the figure of *L. calygonus*, R. P., or is at least nearly allied to this and to *L. daturoides*.

Petasostylis is an artificial genus, chiefly distinguished from *Leianthus* by a two-celled capsule. Both species, collected again by Mr. Wendland (*P. saponarioides* in Costa Rica, *P. nigrescens* in Guatemala), are variable in the size of the flowers: the corolla of both is often two inches long, and the lobes (much too long in the figure of Bot. Mag. t. 4043) only 3-4'''', as described by Schlechtendal.

In Eastern Cuba a remarkable new *Lisianthea* was discovered by Mr. Wright (no. 1346), which, though my materials do not allow the dissection of more than two flowers and a single fruit, may be regarded as a link between *Lisianthus*, of which it has the anthers, and *Leianthus umbellatus*, which it approaches by its axillary peduncles and prominulous leaf-sheaths.

ZONANTHUS, nov. gen.

Involucrum calycem cingens, foliolis geminis rotundatis in tubum breviorum connatis, tubo cupuliformi apice intus in marginem annularem integrum productis. Calyx campanulatus, ecarinatus, demum fissilis, 5-lobus, lobis quadrato-subrotundis planis imbricatis margine membranaceis. Corolla hypocraterimorpha, dextrorsum contorta, ad medium fere 5-loba, tubo campanulato, lobis oblongis obtusis. Stamina medio corollæ tubo inserta, filamentis exsertis, antheris incumbenti-recurvis, loculis connectivo dilatato adnatis. Ovarium placentis suturalibus divisum semi-4-loculare, stylo elongato, stigmate 2-lamellato. Capsula septicida, bivalvis, carpidiis 2 introflexis semi-4-locularis, placentis polyspermis marginalibus, testa reticulata. Frutex, foliis spathulato-oblongis petiolatis, petiolis in vaginam annularem connexis; pedunculi axillares, solitarii, folia subæquantés, uniflori; corolla virens.

Z. CUBENSIS, Gr. Rami teretiusculi, internodiis brevibus; folia 3-4'' longa, obtusiuscula, arcunervia, in petiola 6-10''' longa attenuata; pedunculi 3'', calyx 8''', involucri tubus ei appressus 3-4''' longus,

lobis ejus patulis calycem subæquantibus; corollæ tubus 9''', lobi 8''' longi, 2-3''' lati; capsula oblongo-lanceolata, glutinoso-nitens, fere sesquipollicaris.

Hab. In montibus S. Cataline Cubæ orientalis.

On *Inocarpus*. By GEORGE BENTHAM, Esq., P.L.S.

[Read Feb. 20, 1862.]

AMONGST the plants sent in 1836 from British Guiana by Sir Robert (then Mr.) Schomburgk were some specimens which, he informed me, were gathered from a most beautiful tree, almost covered with bright-yellow flowers, and called by the natives *Etabally*, on account of its frequency at the cataracts of that name on the Essequibo. Recognizing in them the general characters of Leguminosæ of the suborder Cæsalpinieæ, but with many differences from all published genera of that group, I described them in Hooker's 'Journal of Botany,' ii. p. 99, as a new genus, under the name of *Etaballia*; and some years afterwards, Dr. Hooker figured it for me in Hooker's 'Icones,' t. 453, 454. At the same time, I found amongst some unnamed specimens from the Isle of St. Vincent's one so closely resembling the *Etaballia* in general foliage, inflorescence, calyx, and petals, that, although I could not then dissect the flowers, I thought I might venture to allude to it as a second species, to which I gave the name of *E. macrophylla*. This, however, proved to be a cultivated specimen of *Inocarpus edulis*; and as that genus had been described with characters totally incompatible with Leguminosæ, and had been referred either to Sapotaceæ or to Hernandieæ, I laid it aside without further examination, vexed at having brought together into one genus plants belonging to such very different orders. Recently, however, Dr. Hooker and myself had occasion to examine *Inocarpus*, of which we have now very complete flowering specimens from the South Pacific Islands, as well as from various tropical botanical gardens; and we found that the received account of the structure of the ovary is in some important respects erroneous, and that the genus is in fact, as it is in appearance, closely allied to *Etaballia*, and must be placed next to it in Leguminosæ, notwithstanding the gamopetalous corolla. The union indeed of the petals at their base, or rather by their claws, is but little more than that which occurs in most *Trifoliums*, in several *Mimoseæ*, &c.; the ten monadelphous stamens are such as are frequent in Leguminosæ; and the ovary is characteristic of that order, this being perhaps the only organ by which Leguminosæ can be always recognized through all their

varied modifications. In *Etaballia* it consists of a single carpel with a very short terminal but excentric style, and two or three amphitropous ovules with a superior micropylé attached to the upper or inner angle of the cavity, that is, to the side from which the style proceeds. Only one of these ovules comes to maturity; and in one already faded flower I could find only a single ovule, but of the usual form and attachment, and not anatropous nor pendulous from the summit of the cavity, as described by Endlicher. I do not think, however, that this skilful botanist ever examined *Inocarpus* himself. At the time of the publication of his 'Genera,' it was rare in herbaria; and the statement that the ovule was pendulous from the top of the cavity must have been taken from Roxburgh, the only botanist since Rumphius and Forster who has described the plant from actual specimens; and an inspection of the rude and certainly incorrect analysis in the plate of the Coromandel plants (t. 263) probably induced Endlicher to suppose that the ovule must be anatropous. The conversion of the calyx and corolla into an outer calycule and a simple perianth is another proof that Endlicher's character was compiled from books; for an examination of the plant would have shown him that the two lobes of the calyx are not the summits of two united bracts, but formed by the cohesion of the normal five teeth of the calyx into two or sometimes three lobes, as shown by their venation, and sometimes by minute teeth at the apex.

From these incorrect notions of the structure of the flowers which had obtained, it is not to be expected that the place of *Inocarpus* in the natural system could have been accurately fixed. Jussieu, having only Forster's and Thunberg's characters to judge from, referred it to the "genera *Sapotis* affinia;" and, as far as then known, several technical points appeared to connect it with that order. Endlicher, however, studying apparently Roxburgh's figure, sought to connect it with *Hernandia*, in a small group annexed to Thymeleæ; and there more recent authors have left it, raising however the group to an independent order of Monochlamydeæ, under the name of Hernandiaceæ. Even Miquel, in his 'Flora van Nederlandsch Indië,' adopts this view, extracting his characters from Endlicher, although a slight examination of specimens of the two plants, of which he must have had abundance at his disposal, would have shown him that they differed as widely in most of their essential characters as in habit. In the 'Prodromus,' *Inocarpus* is excluded from Sapotaceæ on the authority of Endlicher; and neither that genus nor *Hernandia* is alluded to

under Thymeleæ. All these doubts may now be considered as removed by the reference of *Inocarpus* to Leguminosæ; whilst *Hernandia* remains far away amongst unisexual Monochlamydeæ, allied to those Euphorbiaceæ in which the albumen almost or completely disappears.

The so-called nut, but rather the kernel or seed, of *Inocarpus edulis* appears to be extensively eaten in its native country, and more especially in some of the eastern islands of the Indian Archipelago, where it is said to be very abundant. Rumphius says that, when boiled or roasted in ashes, it is sweet like the Spanish eatable acorns, much prized by the natives of several of the islands, and that in Machian they almost live upon it. According to George Forster, it replaces chestnuts in the Society and Friendly Islands; but is less agreeable, although sweetish, and is ill suited to weak stomachs. Roxburgh, who raised the tree in the Botanic Garden of Calcutta, says that the kernel is certainly eatable, but by no means palatable. Like the *Etaballia*, this tree appears to be hard-wooded and of considerable beauty. The flowers are described as of a pale yellow.

According to Rumphius, the tree yields a resinous glutinous juice, into which the Papuans steep the tips of their arrows, giving them a black colour; and this statement is copied by Forster and subsequent writers. There is some doubt, however, whether Rumphius has not confounded two different trees in his article "Gajanum," Herb. Amboin. i. 170, t. 65, universally referred to *Inocarpus* on the authority of Thunberg. The fruit is indeed so described by Rumphius as to leave little doubt as to its identity, but his representation of the flowers does not at all agree with those of *Inocarpus*. They are figured as borne on long pedicels in a short loose raceme; and the petals are lanceolate, not linear. In all our specimens, wild or cultivated, they are either closely sessile, or the pedicel is so short as to be scarcely perceptible even after the fruit is considerably enlarged, although the stipes of the fruit may then, after the calyx has fallen off, answer the appearance of a pedicel. Forster says indeed that the flowers are "brevissime pedicellati," and that the inflorescence is a raceme, and not a spike; but, in the loose sense in which these words were formerly taken, he may mean that the flowers are distant from each other, and not close together. Forster also describes the flowers as occasionally 6-merous, with twelve stamens; but this must have been accidental. We find them always 5-merous, and Roxburgh so describes them.

With regard to *Etaballia*, there are still some points of affinity and nomenclature to clear up. Dr. Sagot, in his active and scientific explorations of French Guiana, found near Karouany a tree supplying a hard wood, called Boco in the country, and which, from this name and from the station, he concludes to be the *Bocoa provacensis* described and figured by Aublet (Pl. Gui. Supp. 38, t. 391), from specimens without flower or fruit. Dr. Sagot's specimens are in fruit, showing with certainty that they belong to Leguminosæ. He had not seen the flowers; but the foliage and inflorescence, of an unusual description in that order, are so nearly those of *Etaballia*, that he suggested that the two might be at least congeners, if not of one and the same species, and in that case Aublet's older name should be preferred. A further comparison, however, throws some doubt even as to their generic identity. In *Etaballia* the ovary is sessile and very villous, and the funiculus exceedingly short. In *Bocoa* the youngest fruits we have are perfectly glabrous and shortly stipitate; the ovules, even those which are not at all enlarged, are borne on a filiform funiculus at least three times as long as themselves; and as the seed enlarges, this funiculus lengthens in a most remarkable manner, folding itself and coiling backwards and forwards round the outside of the seed, so as almost to enclose it. Until therefore we have seen the flowers of *Bocoa* and the fruit of *Etaballia*, it is most prudent to maintain the two genera as distinct.

Again, as to the name *Etaballia*, Sir R. Schomburgk, in his later expeditions, learned that it was not this tree, but a species of *Vochysia*, which the natives named after the cataract. These errors as to native names are so frequent that their use in botanical nomenclature ought to be restricted to very exceptional cases; but, in the present instance, if *Etaballia* does not merge into *Bocoa*, the rule of priority—one of the most important to maintain in botanical nomenclature—would require the retention of that name, notwithstanding the probability of its original incorrectness.

The following are the technical characters of the three genera, independently of those which are common to all Cæsalpinieæ.

1. INOCARPUS. *Forst. Char. Gen.* p. 65, t. 33. Calyx tubuloso-campanulatus, 2- rarius 3-lobus, lobis rotundatis. Petala 5, basi in tubum coalita, supra calycem libera, linearia, subæqualia, imbricata summo intimo, apice corrugato-involuta. Stamina 10, filamentis in tubum corollæ adnatum alte coalitis, alterna longiora; antheræ consimiles,

breves didymæ. Ovarium subsessile. Stylus brevissimus, stigmatè oblique dilatato-concavo. Ovula 2-3, rarissime solitaria, amphitropa, subascendentia funiculo brevissimo suturæ appensa. Legumen breviter stipitatum, obovato-incurvum, subdrupaceum. sarcocarpio tenui, endocarpio crasso fibroso, monospermum. Semen late ovatum, funiculo brevissimo turbinato-incrassato affixum. Testa rigide membranacea, reticulato-venosa. Albumen 0. Cotyledones crasso-carnosæ, radícula brevissima supera leviter incurva. "Plumula squamulis minimis imbricatis obtecta."

Arbor excelsa, glabra. Folia simplicia (unifoliolata), brevissime petiolata, ovali-oblonga, penninervia, coriacea. Stipulæ parvæ. Spicæ axillares laxæ. Flores pallide flavi, ad axillas bractearum parvarum sessiles v. subsessiles, bracteolis minutis v. inconspicuis.

Species unica, *I. dulcis*, Forst., in insulis Oceani Pacifici v. Archipelagi Indici spontanea v. culta. Semina edulia. *Gærtn. f. Fruct.* iii. t. 199, et 200. f. 1. *Roxb. Pl. Corom.* iii. t. 263.

2. ETABALLIA. *Benth. in Hook. Journ. Bot.* ii. 99. Calyx tubulosus, 5-dentatus v. dentibus summis coalitis 4-dentatus. Petala 5, libera v. vix ima basi tubo stamineo coalita, linearia, subæqualia, imbricata summo intimo, apice corrugato-involuta. Stamina 10, hypogyna, alte monadelphæ, alterna paullo longiora; antheræ consimiles, breves, didymæ. Ovarium sessile. Stylus cylindricus, stigmatè obliquo parum incrassato. Ovula 3-4, amphitropa, funiculis brevissimis appensa. Legumen.....

Arbor pulcherrima, ramis glabris. Folia simplicia (unifoliolata), brevissime petiolata, ovata v. ovato-oblonga, penninervia, coriacea, glabra v. subtus puberula. Stipulæ parvæ. Spicæ axillares v. terminales, densæ, novellæ bracteis imbricatis lupulinæ. Flores flavi, ad axillas bractearum mox deciduarum solitarii, sessiles, bibracteolati. Calyx ferrugineus. Ovarium villosum.

Species unica Guianensis. *Hook. Ic. Pl.* t. 453, 454.

3. BOCOA. *Aubl. Pl. Gui.* t. 391. Calyx tubulosus?, deciduus. Petala... Stamina..... Ovarium breviter stipitatum? ovulis paucis funiculo longo appensis. Legumen (parvum) breviter stipitatum, oblique ovato-subfalcatum, coriaceum, bivalve. Semen unicum, funiculo longissimo filiformi contortuplicato ad hilum turbinato-incrassato semen extus pluries circumdante; albumen 0; cotyledones crassiusculæ; radícula brevissima.

Arbor glaberrima ligno durissimo. Folia simplicia (unifoliolata), breviter petiolata, ovata, penninervia, coriacea, nitida. Stipulæ parvæ v. inconspicuæ. Spicæ ad nodos vetustos solitariæ v. fasciculatæ.

Species unica Guianensis. Flores ignoti. Ovarium jam auctum breviter stipitatum, glaberrimum. Semina in speciminibus immatura.

On the Three remarkable Sexual Forms of *Catasetum tridentatum*, an Orchid in the possession of the Linnean Society. By CHARLES DARWIN, M.A., F.R.S., F.L.S.

[Read April 3, 1862.]

THE President and Officers of the Linnean Society having kindly permitted me to examine the remarkable specimen, preserved in spirits in their collection, of an Orchid bearing flowers of two supposed genera, and known sometimes to bear the flowers of a third genus, I have thought that the Society might like to hear a short account and explanation of this singular case. The following details will hereafter appear in a small work on the 'Fertilization of Orchids by Insect-agency,' which I am preparing for early publication.

Botanists were astonished when Sir R. Schomburgk* stated that he had seen three distinct forms, believed to constitute three distinct genera, namely *Catasetum tridentatum*, *Monachanthus viridis*, and *Myanthus barbatus*, all growing on the same plant. Lindley† remarked that "such cases shake to the foundation all our ideas of the stability of genera and species." Sir R. Schomburgk affirms that he has seen hundreds of plants of *C. tridentatum* in Essequibo without ever finding one specimen with seeds‡, but that he was surprised at the gigantic seed-vessels of the *Monachanthus*; and he correctly remarks that here we have traces of sexual difference in Orchideous flowers.

The general appearance of the flower of *Catasetum tridentatum*, in its natural position, is given in the diagram, p. 152 (fig. 1); but the two lower sepals have been cut off. The column is figured separately in an upright position, showing the two curious prolongations of the rostellum, or, as I shall call them, the antennæ.

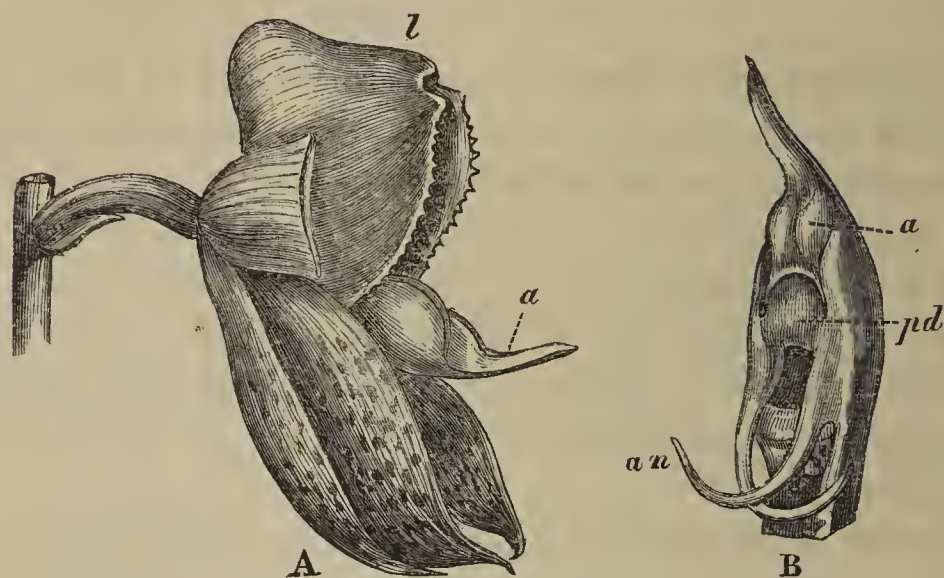
* 'Transactions of the Linnean Society,' vol. xvii. p. 522. Another account, by Dr. Lindley, has appeared in the 'Botanical Register,' vol. xxiii. fol. 1951, of a distinct species of *Myanthus* and *Monachanthus* appearing on the same scape: he alludes also to other cases. Some of the flowers were in an intermediate condition, which is not surprising, seeing that in diœcious plants we sometimes have a partial resumption of the characters of both sexes. Mr. Rogers, of River Hill, informs me that he imported from Demerara a *Myanthus*, but that when it flowered a second time it was metamorphosed into a *Catasetum*. Dr. Carpenter ('Comparative Physiology,' fourth edition, p. 633) alludes to an analogous case which occurred at Bristol.

† 'The Vegetable Kingdom,' 1853, p. 178.

‡ Brongniart states (Bull. de la Soc. Bot. de France, 1855, tom. ii. p. 20) that M. Neumann, a skilful fertilizer of Orchids, could never succeed in fertilizing *Catasetum*.

A deep chamber, which from its homological relations must be called the stigmatic chamber, lies between the bases of the an-

Fig. 1.



CATASETUM TRIDENTATUM.

a. anther.*an.* antennæ.*pd.* pedicel of pollinium.*l.* labellum.

A. Side view of flower in its natural position with the properly lower sepals cut off.

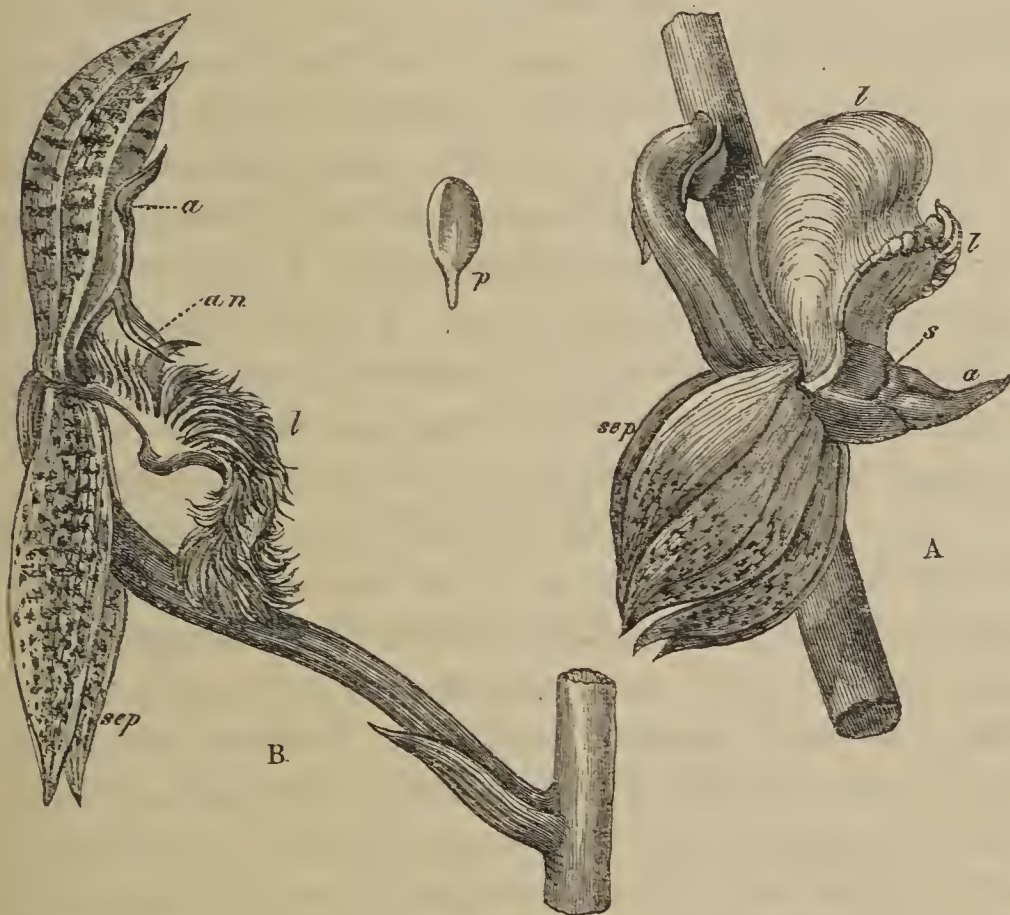
B. Front view of column, placed upright.

tennæ; and the anther, with its concealed pollen-masses, is seated above. My object is not here to describe in detail the structure of the flower and its curious mechanism. But it must be observed that the ovarium is much shorter, thinner, less deeply furrowed, more solid in the centre, and the bract at its base smaller, than in the two succeeding sexual forms presently to be described. The ovarium is bent so that the bucket-like labellum stands uppermost, instead of forming the lower lip as in most Orchids

From what I had myself observed previously to reading Sir R. Schomburgk's paper, I was led to examine carefully the female organs of this species, and, I may add, of *C. callosum* and *C. saccatum*. In no case was the stigmatic surface viscid, as it is in all other Orchids (excepting *Cypripedium*), and as is indispensable for securing the pollen-masses on the rupture of the caudicles. I carefully looked to this point in both young and old flowers of *C. tridentatum*. When the surface of the stigmatic chamber and of the stigmatic canal of the above-named three species is scraped off, after having been kept in spirits of wine, it is found to be composed of utriculi (with nuclei of the proper shape), but not nearly so numerous as with ordinary Orchids. The utriculi cohere more together, and are more transparent. I examined for comparison the utriculi of many kinds of Orchids, which had been kept in

spirits, and in all found they were much less transparent. Again, in all three species of *Catasetum* the ovule-bearing cords are short, and the ovules present a considerably different appearance, in being thinner, more transparent, and less pulpy than in the numerous other Orchids examined for comparison. They were, however, in not so completely an atrophied condition as in the genus *Acropera*. Although they correspond so closely in general appearance and position with true ovules, perhaps I have no strict right so to designate them, as I was unable in any case to make out the opening of the testa and the included nucleûs; nor were the ovules ever inverted. From these several facts—namely, the shortness, thinness, and smoothness of the ovarium, the shortness of the ovule-bearing cords, the state of the ovules themselves, the stigmatic surface not being viscid, the empty condition of the utriculi—and from Sir R. Schomburgk never having seen *C. tridentatum* producing seed in its native home, we may confidently look at this species of *Catasetum*, as well as the other two species, as male plants.

Fig. 2.



MYANTHUS BARBATUS.

- a. anther.
- an. antennæ.
- l. labellum.

MONACHANTHUS VIRIDIS.

- p. pollen-mass, rudimentary.
- s. stigmatic cleft.
- sep. two lower sepals.

A. Side view of *Monachanthus viridis* in its natural position.

(The shading in both drawings has been added from M. Reiss's drawing in the 'Linnean Transactions'.)

B. Side view of *Myanthus barbatus* in its natural position.

With respect to *Monachanthus viridis* and *Myanthus barbatus*, these two forms are seen, in the specimen sent home by Sir R. Schomburgk, and preserved in spirits in the Society's collection, to be borne on the same spike. They are represented in the diagrams, page 153. The flower of the *Monachanthus*, like that of the *Catasetum*, grows lower side uppermost. The labellum is not nearly so deep, especially on the sides, and its edges are crenated. The other petals and sepals are all reflexed, and are not so much spotted as in the *Catasetum*. The bract at the base of the ovarium is much larger. The whole column, especially the filament at its summit and the spike-like anther, is much shorter; and the front of the rostellum is much less protuberant. The antennæ or horn-like prolongations of the rostellum are entirely absent. The pollen-masses are rudimentary: I could find no trace of a viscid disk or of a pedicel; if they exist, they must be quite rudimentary, for there is hardly any space for the imbedment of the disk. The absence of the antennæ in this Orchid, which has no pollen-masses to eject, is an interesting fact, as it accords with the view to which I have been led by an examination of three living species of *Catasetum*, namely, that the function of the antennæ is to convey the stimulus of a touch to the medial part of the rostellum, causing the membrane round the disk to rupture, and consequently the liberation and ejection of the pollen-masses. Instead of a large stigmatic chamber, there is a narrow transverse cleft close beneath the small anther. I was able to insert one of the pollen-masses of the male *Catasetum* into this cleft, which, from having been kept in spirits, was lined with coagulated beads of viscid matter and with utriculi. The utriculi, differently from those in *Catasetum*, were charged (after having been kept in spirits) with brown matter. The ovarium is much longer, thicker near the base, and more plainly furrowed than in *Catasetum*; the ovule-bearing cords are also much longer, and the ovules more opaque and pulpy, as in all common Orchids. I believe that I saw the opening at the partially inverted end of the testa with a large nucleus projecting; but as the specimens had been kept many years in spirits, and were somewhat altered, I dare not speak positively. From these several facts it is almost certain that *Monachanthus* is a female plant; and Sir R. Schomburgk saw it seeding abundantly. Altogether this flower differs in a most remarkable manner from that of the male *Catasetum tridentatum*, and it is no wonder that they were formerly ranked as distinct genera.

The pollen-masses offer so curious and good an illustration of a structure in a rudimentary condition, that they are worth description; but first I must briefly describe the perfect pollen-masses of the male *Catasetum*. These consist of a large sheet of cemented or waxy pollen-grains, folded over so as to form a sac with an open slit along the lower surface; into this slit cellular tissue enters whilst the pollen is in the course of development in the bud. Within the lower and produced end of each pollen-mass a layer of highly elastic tissue, forming the caudicle, is attached, the other end being attached to the strap-shaped pedicel of the pollinium. The exterior grains of pollen are more angular, have thicker walls, and are yellower than the interior grains. In the early bud the two pollen-masses are enveloped in two conjoined membranous sacs, which are soon penetrated by the two produced ends of the pollen-masses, and by their caudicles; and then the ends of the caudicles adhere to the pedicel. Before the flower expands, the membranous sacs including the pollen-masses open, and leave them resting naked on the back of the rostellum.

In *Monachanthus* the two membranous sacs containing the rudimentary pollen-masses never open; they easily separate from each other and from the anther. The tissue of which they are formed is thick and pulpy. Like most rudimentary parts, they vary greatly in size and in form. The included, and therefore useless, pollen-masses are not one-tenth of the bulk of the pollen-masses of the male: they are flask-shaped, with the lower and produced end greatly exaggerated, and almost penetrating through the exterior or membranous sac. The flask is closed, and there is no fissure along the lower surface. The exterior pollen-grains are square and have thicker walls than the interior grains, just as in the proper male pollen; and what is very curious, each cell has its nucleus. Now R. Brown* states that, in the early stages of the formation of the pollen-grains in ordinary Orchids, a minute areola or nucleus is often visible; so that the rudimentary pollen-grains of the *Monachanthus* apparently have retained (as is so general with rudiments in the animal kingdom) an embryonic character. Lastly, at the base, within the flask of pollen, there is a little sheet of brown elastic tissue—that is, a vestige of a caudicle—which runs far up the produced end of the flask, but does not (at least in some of the specimens) come to the surface, and could not have been attached to any part of the rostellum. These rudimentary caudicles are, therefore, utterly useless.

* Transactions of the Linnean Society, vol. xvi. p. 711.

We thus see that every single detail of structure of the male pollen-masses, with some parts exaggerated and some parts slightly modified, is represented by these mere rudiments in the female plant. Such cases are familiar to every observer, but can never be examined without renewed interest.

We now come to the third form, *Myanthus barbatus*, often borne on the same plant with the two preceding forms. Its flower, in external appearance, but not in essential structure, is the most different of all. It generally stands in a reversed position, compared with *Catasetum* and *Monachanthus*—that is, with the labellum downwards. The labellum is fringed, in an extraordinary manner, with long papillæ; it has a quite insignificant medial cavity, at the hinder margin of which a curious curved and flattened horn projects. The other petals and sepals are spotted and elongated, with the two lower sepals alone reflexed. The antennæ are not so long as in the male *C. tridentatum*, and they project symmetrically on each side of the horn-like projection at the base of the labellum, with their tips (which are not roughened with papillæ as in the male flower) almost entering the medial cavity. The stigmatic chamber is of nearly intermediate size between that of the male and female forms; it is lined with utriculi, charged with brown matter. The straight and well-furrowed ovarium is nearly twice as long as in *Monachanthus*, but is not so thick where it joins the flower; the ovules are not so numerous as in the female form, but are opaque and pulpy after having been kept in spirits, and resemble them in all respects. I believe, but dare not speak positively as in the case of the *Monachanthus*, that I saw the nucleus projecting from the testa. The pollinia are about a quarter of the size of those of the male *Catasetum*, but have a perfectly well developed disk and pedicel. The pollen-masses were lost in the specimens examined by me; but fortunately M. Reiss has given, in the 'Linnean Transactions,' a drawing of them, showing that they are of due proportional size, and have the proper folded or cleft structure; so that there can hardly be a doubt that they are functionally perfect. As we thus see that both the male and female organs are apparently perfect, *Myanthus barbatus* may be considered as the hermaphrodite form of the same species, of which the *Catasetum* is the male, and the *Monachanthus* the female.

It is not a little singular that the hermaphrodite *Myanthus* should resemble in its whole structure much more closely the male forms of two distinct species (namely *C. saccatum* and, more especially, *C. callosum*) than either its own male or female forms.

Finally, the genus *Catasetum* is interesting in an unusual degree in several respects. The separation of the sexes is unknown in other Orchids, excepting probably in the allied genus *Cycnoches* and in one other member of the *Vandææ*, namely, *Acropera*. In *Catasetum* we have three sexual forms, generally borne on separate plants, but sometimes mingled together; and these three forms are wonderfully different from each other—much more different than, for instance, a peacock is from a peahen. But the appearance of these three forms on the same plant now ceases to be an anomaly, and can no longer be viewed as an unparalleled instance of variability.

Still more interesting is this genus in its mechanism for fertilization. We see a flower patiently waiting, with its antennæ stretched forth in a well-adapted position, ready to give notice whenever an insect puts its head into the cavity of the labellum. The female *Monachanthus*, not having pollinia to eject, is destitute of antennæ. In the male and hermaphrodite forms, namely *Catasetum* and *Myanthus*, the pollinia lie doubled up like a spring, ready to be instantaneously shot forth when the antennæ are touched. The disk end is always projected foremost, and is coated with viscid matter, which quickly sets hard and firmly affixes the hinged pedicel to the insect's body. The insect flies from flower to flower, till at last it visits a female or hermaphrodite plant; it then inserts one of the balls of pollen into the stigmatic cavity. When the insect flies away, the elastic caudicle, made weak enough to yield to the viscosity of the stigmatic surface, breaks, and leaves behind the pollen-mass; then the pollen-tubes slowly protrude, penetrate the stigmatic canal, and the act of fertilization is completed. Who would have been bold enough to surmise that the propagation of a species should have depended on so complex, so apparently artificial, and yet so admirable an arrangement?

Notice of a Collection of Algæ made on the North-West Coast of North America, chiefly at Vancouver's Island, by DAVID LYALL, Esq., M.D., R.N., in the years 1859–61. By W. H. HARVEY, M.D., F.R.S. & L.S., Professor of Botany in the University of Dublin, &c.

[Read February 20, 1862.]

SEVERAL parcels of Algæ, collected by Dr. David Lyall on the coasts of Vancouver's Island and in the neighbouring seas, and

communicated by him to the herbarium at Kew, have been placed in my hands for determination. In the subjoined descriptive catalogue I have given the results of my examination, and shall merely preface the technical matter by a few general observations.

The whole number of species ascertained is 107, of which 100 are marine, and 7 freshwater species. The latter are as follows :—

A <i>Vaucheria</i> (<i>undeterminable</i>).	<i>Conferva floccosa</i> .
<i>Batrachospermum moniliforme</i> .	A <i>Zygnema</i> (<i>undetermined</i>).
<i>Cladophora glomerata</i> .	<i>Hydrurus penicillatus</i> .
<i>Conferva rivularis</i> .	

All of these (including probably the undeterminable ones) are also British, and only one of them, *Hydrurus penicillatus*, is of local distribution. Dr. Lyall's specimens of this plant are of small size; but at Santa Fé, in New Mexico, Mr. Fendler has collected it in great abundance and of gigantic size, his specimens being sometimes two feet in length.

Of the 100 marine Algæ, *eleven* are either new species or well-marked new forms to which I have given specific names, namely these :—

<i>Agarum fimbriatum, H.</i>	<i>Cystoclonium gracilarioides, H.</i>
<i>Laminaria apoda, H.</i>	<i>Callophyllis flabellulata, H.</i>
<i>Ectocarpus oviger, H.</i>	<i>Prionitis Lyallii, H.</i>
<i>Rhodomela Lyallii, H.</i>	<i>Schizymenia coccinea, H.</i>
<i>Polysiphonia senticulosa, H.</i>	<i>Callithamnion subulatum, H.</i>
<i>Hymenena latissima, H.</i>	

Of these the most remarkable is *Laminaria apoda*, which differs, as its name imports, from all other species of *Laminaria* in absolutely wanting a stipes. In other species, indeed, the stipes varies from less than half an inch to 12–15 feet in length; but in all cases a more or less obvious stipes interposes between the root and the lamina, and the new portion of frond grows between the apex of the stipes and the base of the lamina. In our *L. apoda* the stipes is represented by a basal callosity or thickening of the lamina, from which a fascicle of fibrous branching roots directly springs. Dr. Lyall has sent numerous specimens of various ages and sizes, and all have precisely similar characters; I do not doubt, therefore, that this is a well-marked and limited form. The nearest approach to *L. apoda* that I have seen occurs in some of the shorter-stemmed varieties of *L. dermatodea*; but I am not possessed of any specimen which could be regarded as intermediate.

I am not so confident of the distinctness of my *Agarum fimbriatum* from *A. pertusum*. The fimbriated character is not a very cer-

tain one; for it occurs occasionally in Algæ when developed under unusual circumstances; or it may arise from proliferous growth, after wounding at an early age. More specimens, and specimens of various ages, are required fully to establish this species.

Of *Hymenena latissima* many specimens were collected, but comparatively few of them were of adult age. The younger are undistinguishable from some *Nitophylla* in structure, the generic distinction not generally becoming obvious till fruit begins to be formed. Then the long lines of tetraspores are obviously separated by immersed and anastomosing veins, as in the original *H. fissa*, from which species and from *H. fimbriata* our plant is quite distinct.

Of the other new species, *Callophyllis flabellulata* is remarkable for closely simulating *Euthora cristata*; *Prionitis Lyallii* for its extraordinary variations in ramification and size; and *Callithamnion subulatum* for combining the characters of *C. americanum* and *C. floccosum*.

The species peculiar to the North-west Coast of America are 32, of which 7 are Melanosperms and 25 Rhodosperms, viz.—

Cystophyllum Lepidium, P. & R.	Rhodymenia pertusa, Ag.
Phyllospora Menziesii, Ag.	Cystoclonium gracilarioides, H.
Nereocystis Lütkeanus, P. & R.	Callophyllis flabellulata, H.
Alaria marginata, P. & R.	Constantinea Sitchensis, P. & R.
Agarum fimbriatum, H.	Gigartina mollis, Bail. & Harv.
Laminaria apoda, H.	Chondrus affinis, H.
Ectocarpus oviger, H.	Endocladia muricata, Ag.
—	Halosaccion Hydrophora, J. Ag.
Rhodomela Larix, Ag.	Prionites Lyallii, H.
R. floccosa, Ag.	P. lanceolata, H.
R. Lyallii, H.	Schizymenia Mertensiana, P. & R.
Polysiphonia Californica, H.	S. coccinea, H.
P. senticulosa, H.	Microcladia Coulteri, H.
Amphiroa Californica, Dcne.	M. borealis, P. & R.
Hymenena fimbriata, P. & R.	Ptilota Californica, P. & R.
H. latissima, H.	Callithamnion subulatum, H.
Rhabdonia Coulteri, H.	

The following, from among the peculiar North-west American species are “represented” by allied species in other seas, viz.—

Phyllospora Menziesii, by Phyllospora comosa, in Australia.

Alaria marginata, by Alaria esculenta, in Europe.

Rhodomela Larix, by Rhodomela lycopodioides, in Europe.

Hymenena fimbriata, by Hymenena fissa, at the Cape of Good Hope.

Rhodymenia pertusa, by Rhodymenia polymorpha, in Australia.

- Callophyllis flabellulata, by Callophyllis coccinea, *var. pusilla*, in Australia.
 Constantinea Sitchensis, by Constantinea Rosa marina, Kamtskatka.
 Chondrus affinis, by Chondrus crispus, in Europe.
 Halosaccion Hydrophora, (an *analogous* species to) Gloiosaccion Brownii, in Australia.
 Prionitis Lyallii, by Prionitis crinita, in Kamtskatka.
 Callithamnion subulatum, by Callithamnion floccosum, in Europe.

The following 43 species are common to the Atlantic Coasts of North America, and those marked with an asterisk are peculiarly American :—

- | | |
|--|--|
| *Fucus furcatus, <i>Ag.</i> | Rhodymenia Palmetta, <i>Grev.</i> |
| F. vesiculosus, <i>L.</i> | Ahnfeldtia plicata, <i>Ag.</i> |
| Desmarestia viridis, <i>Lx.</i> | Callophyllis laciniata, <i>Kg.</i> |
| D. aculeata, <i>Lx.</i> | Gigartina mamillosa, <i>Lx.</i> |
| *Alaria Pylaii, <i>Grev.</i> | Halymenia ligulata, <i>Ag.</i> |
| Laminaria saccharina, <i>Ag.</i> | Gloiosiphonia capillaris, <i>Carm.</i> |
| *L. dermatodea, <i>De la Pyl.</i> | Ceramium rubrum, <i>Ag.</i> |
| L. fascia, <i>Ag.</i> | C. diaphanum, <i>Ag.</i> |
| Striaria attenuata, <i>Grev.</i> | C. tenuissimum, <i>Ag.</i> |
| Chorda lomentaria, <i>Lgb.</i> | Callithamnion polyspermum, <i>Ag.</i> |
| Ectocarpus siliculosus, <i>Lgb.</i> | *C. Americanum, <i>H.</i> |
| E. littoralis, <i>Lgb.</i> | C. floccosum, <i>Ag.</i> |
| Odonthalia angustifolia, <i>Suhr.</i> | Porphyra vulgaris, <i>Ag.</i> |
| *Chondria atropurpurea, <i>H.</i> | Enteromorpha compressa, <i>Lk.</i> |
| Polysiphonia atrorubescens, <i>Grev.</i> | E. intestinalis, <i>Lk.</i> |
| P. urceolata, <i>Grev.</i> | Ulva latissima, <i>Ag.</i> |
| Corallina officinalis, <i>L.</i> | U. Linza, <i>L.</i> |
| Delesseria Hypoglossum, <i>Ag.</i> | Cladophora arcta, <i>H.</i> |
| D. alata, <i>Ag.</i> | C. glaucescens, <i>Griff.</i> |
| Gracilaria confervoïdes, <i>Grev.</i> | C. lætevirens, <i>Kg.</i> |
| Plocamium coccineum, <i>Lyngb.</i> | Hormosira Carmichaëlii, <i>Kg.</i> |
| Rhodymenia palmata, <i>Grev.</i> | |

The following 45 are natives of the British Islands, and generally of the Atlantic Coasts of Europe; those marked with an asterisk have not yet been found on the Atlantic Coast of America :—

- | | |
|----------------------------------|--|
| Fucus vesiculosus, <i>L.</i> | Ectocarpus littoralis, <i>Lgb.</i> |
| Desmarestia viridis, <i>Lx.</i> | E. siliculosus, <i>Lgb.</i> |
| D. aculeata, <i>Lx.</i> | Polysiphonia atrorubescens, <i>Grev.</i> |
| *D. ligulata, <i>Lx.</i> | P. urceolata, <i>Grev.</i> |
| *Carpomitra Cabreræ, <i>Kg.</i> | *Laurencia pinnatifida, <i>Lx.</i> |
| Laminaria saccharina, <i>Ag.</i> | Corallina officinalis, <i>L.</i> |
| L. fascia, <i>Ag.</i> | Delesseria Hypoglossum, <i>Ag.</i> |
| Striaria attenuata, <i>Grev.</i> | D. alata, <i>Ag.</i> |
| Chorda lomentaria, <i>Lx.</i> | Gracilaria confervoïdes, <i>Grev.</i> |

- | | |
|--|---------------------------------------|
| Plocamium coccineum, <i>Lyngb.</i> | Callithamnion polyspermum, <i>Ag.</i> |
| Rhodymenia palmata, <i>Grev.</i> | * <i>C. thujoideum, Ag.</i> |
| R. Palmetta, <i>Grev.</i> | <i>C. floccosum, Ag.</i> |
| Ahnfeldtia plicata, <i>Ag.</i> | * <i>Codium tomentosum, Ag.</i> |
| Callophyllis laciniata, <i>Kg.</i> | <i>Porphyra vulgaris, Ag.</i> |
| * <i>Kallymenia reniformis, Ag.</i> | <i>Enteromorpha compressa, Lk.</i> |
| <i>Gigartina mamillosa, Ag.</i> | <i>E. intestinalis, Lk.</i> |
| <i>Halymenia ligulata, Ag.</i> | <i>Ulva latissima, Ag.</i> |
| * <i>Schizymenia Dubyi, Ag.</i> | <i>U. Linza, L.</i> |
| <i>Gloiosiphonia capillaris, Carm.</i> | <i>Cladophora arcta, H.</i> |
| <i>Ceramium rubrum, Ag.</i> | <i>C. glaucescens, Griff.</i> |
| <i>C. diaphanum, Ag.</i> | <i>C. lætevirens, Kg.</i> |
| <i>C. tenuissimum, Ag.</i> | <i>Hormosira Carmichaëlii, Kg.</i> |
| * <i>Callithamnion Arbuscula, Lgb.</i> | |

The two following are natives of the Mediterranean Sea, but not of the British Isles nor of the Atlantic Coasts of Europe:—

- | | |
|------------------------------|----------------------------|
| <i>Amphiroa palmata, Kg.</i> | <i>Ulva fasciata, Del.</i> |
|------------------------------|----------------------------|

The following 20 are found on the West Coast of South America; those marked with an asterisk are also British:—

- | | |
|---|--------------------------------------|
| * <i>Desmarestia viridis, Lx.</i> | * <i>Ahnfeldtia plicata, Ag.</i> |
| <i>Macrocystis pyrifera, Ag.</i> | <i>Callophyllis variegata, Kg.</i> |
| * <i>Laminaria saccharina, Ag.</i> | <i>Gigartina radula, Ag.</i> |
| * <i>Chorda lomentaria, Grev.</i> | <i>Iridæa cordata, Bory.</i> |
| * <i>Ectocarpus siliculosus, Lyngb.</i> | * <i>Ceramium rubrum, Ag.</i> |
| <i>Polysiphonia dendroidea, Mont.</i> | * <i>C. diaphanum, Ag.</i> |
| * <i>Corallina officinalis, L.</i> | * <i>Codium tomentosum, Ag.</i> |
| * <i>Gracilaria confervoïdes, Grev.</i> | * <i>Porphyra vulgaris, Ag.</i> |
| * <i>Plocamium coccineum, Lyngb.</i> | * <i>Enteromorpha compressa, Ag.</i> |
| <i>Rhodymenia corallina, Bory.</i> | * <i>Ulva latissima, Ag.</i> |

The following 20 are common to Australia; those marked with an asterisk are also British:—

- | | |
|---|--------------------------------------|
| * <i>Desmarestia ligulata, Lgb.</i> | * <i>Halymenia ligulata, Ag.</i> |
| * <i>Carpomitra Cabrerae, Kg.</i> | <i>Ceramium cancellatum, Ag.</i> |
| <i>Macrocystis pyrifera, Ag.</i> | * <i>C. rubrum, Ag.</i> |
| * <i>Chorda lomentaria, Grev.</i> | * <i>C. diaphanum, Ag.</i> |
| * <i>Ectocarpus siliculosus, Lgb.</i> | * <i>C. tenuissimum, Ag.</i> |
| * <i>Amphiroa corymbosa, Lx.</i> | * <i>Codium tomentosum, Ag.</i> |
| * <i>Corallina officinalis, L.</i> | * <i>Porphyra vulgaris, Ag.</i> |
| * <i>Gracilaria confervoïdes, Grev.</i> | * <i>Enteromorpha compressa, Ag.</i> |
| * <i>Plocamium coccineum, Lgb.</i> | * <i>Ulva latissima, Ag.</i> |
| <i>Gigartina radula, Ag.</i> | <i>Ulva rigida, Ag.</i> |

From the foregoing lists it appears, taking Dr. Lyall's collections for a fair specimen of the marine botany of Vancouver's Island, that,

- 1st. There are no local species of *Chlorospermeæ*. The few species that were found by Dr. Lyall are all plants of very wide distribution.
- 2nd. The species of *Melanospermeæ* and *Rhodosperrmeæ* that are peculiar to the North-west Coast of America amount to about one-third of the whole number collected.
- 3rd. About one-third of these peculiar species have representatives in other countries; namely, four in Australia, four in Europe, two in North-eastern Asia, and one at the Cape of Good Hope.
- 4th. Forty-three per cent. of the whole number collected are common to the East Coast of North America, 45 per cent. to the Atlantic Coasts of Europe, 20 per cent. to the West Coast of South America, and 20 per cent. to the Australian shores. This comparison shows that there is greater affinity between the marine vegetation of the Western Coasts of America and of Europe than between the Western and Eastern Coasts of America.
- 5th. Out of those common to West and East America, all except six are also British; while of those common to West America and to Britain, eight have not yet been recorded from the East Coast of America.
- 6th. Of those common to South America, three-sevenths are also British; and of those common to Australia, four-fifths are British. But of those species which are common to Britain and either to South America or to Australia, all but one (*Carpomitra Cabreræ*) are so widely diffused that they may be regarded as almost cosmopolitan.

On the whole, the collection does not give evidence of a very extensive marine flora, but rather of a vegetation abounding in species of larger and coarser growth, and deficient in those delicately organized species which frequent shallow bays and estuaries. The most remarkable and characteristic of the Vancouver-Island Algæ are the *Laminariaceæ*, many of which are of such gigantic size that full-grown specimens can hardly be expected ever to be seen in Europe. The *Nereocystis* has a stipes said to attain the length of 300 feet. The *Alaria* probably have fronds of 20 to 30 feet in length—an enormous size for an undivided lamina of cellular tissue; and the *Costaria* and *Agarum*, though much smaller, still reach dimensions which appear extraordinary when compared with the dwarfer Laminarioid plants of the British shores. The selecting of herbarium specimens, characteristic without being inconveni-

ently large, of such unwieldy objects is no easy task; and Dr. Lyall deserves thanks and praise for the manner in which he has performed it, nor less for the great care with which he has preserved all his specimens, the minute localization of each, and the pains bestowed in furnishing extensive suites of each species. So variable are some of these Algæ in form, that, without examining long suites of specimens of different sizes and ages, it would be difficult or impossible to say what was a species and what a variety. Even with the ample materials supplied to me by Dr. Lyall, I fear that I have not in every case succeeded in unravelling this tangle.

MELANOSPERMEÆ.

1. *Fucus vesiculosus*, var. *evesiculosus*, *J. Ag. Sp. Alg.* i. 210.

Common between tide-marks. Vancouver's Island; Esquimalt and Victoria Harbours.

A narrower form on the outer sea-coast; a broader within the harbour. Also a very dwarf form from the outer sea-coast, 1–2 inches high, once-forked and fruiting; very similar to the dwarf variety from the Canary Islands, described by Montagne, 'Crypt. Canar.'

2. *Fucus furcatus*, *Ag.?* *Ic. t.* 14; *J. Ag. Sp. Alg.* i. p. 209.

Between tide-marks. Esquimalt; Vancouver's Island.

Of Agardh's plant I have seen no authentic specimen. Dr. Lyall's specimens differ from *F. vesiculosus*, var. *evesiculosus*, chiefly in the more immersed, less defined midrib, the uniformly narrower frond, 2–3 lines, rarely 4 lines wide, and the more slender, compressed, not turgid receptacles. My *F. Wrightii*, from Japan, scarcely differs. I fear that neither ought to be regarded as other than local varieties of *F. vesiculosus*, which sometimes, even in Europe, occurs with as narrow fronds. The elder Agardh's figure, above quoted, is worthless as a guide to the species described by J. Agardh.

3. **CYSTOPHYLLUM LEPIDIUM** (*Rupr.*). *Caule crasso brevi, frondibus elongatis teretibus (crassiusculis) inermibus pinnato-ramosissimis, ramis undique egredientibus geminatis sparsisque basi sæpe foliosis, foliis lineari-lanceolatis enerviis planis acutis, ramulis vesiculiferis subcorymbosis, vesiculis sub apice ramuli indivisi solitariis ovalibus mucronatis, receptaculis ?—Cystoseira Lepidium, Rupr. Alg. Mar. Ochotzk, p. 155.*

On rocks below low-water mark. Entrance of Esquimalt Harbour; also dredged in 14 fathoms at St. Juan Island, 48° 30' N., 132' W.

Stem 2–3 inches long. Fronds numerous, closely inserted, 2–3 feet long, 1–1½ line in diameter, in outline of branches lanceolate. Lateral branches 4–6 inches long, in pairs or irregularly scattered, patent, sub-bipinnate; the lower pinnules leaf-bearing, the upper vesiculiferous, each ramulus having a vesicle below its apex. Vesicles 1–1½ line long, like the pods of some *Lepidium*. No fruit on our specimens, which quite agree with those distributed by Dr. Ruprecht, from the Sea of Ochotzk. Though nearly allied to *C. geminatum*, J. Ag., it appears to be distinct.

4. *Phyllospora Menziesii*, Ag.; Harv.; Ner. Bor. Amer. i. p. 62, t. 3. f. B.

Rocks at low tide, outer sea-coast; Esquimalt and Fuca Strait. Dr. Lyall & C. Wood.

5. *Desmarestia viridis*, Lamour.; Ner. Bor. Amer. i. p. 77.

Rocks below low-water mark; Esquimalt Harbour and Fuca Strait, Dr. Lyall; cast ashore, Esquimalt, C. Wood; dredged in 6–8–10 fathoms Dr. Lyall & C. Wood.

6. *Desmarestia aculeata*, Lamour.; Ner. Bor. Amer. i. p. 78.

Rocks at low water; Esquimalt Harbour, and dredged in 8–10 fathoms, Dr. Lyall & C. Wood.

7. *Desmarestia ligulata*, Lamour.; Ner. Bor. Amer. i. p. 78.

Rocks below low-water mark; Esquimalt Harbour, Dr. Lyall & C. Wood; Burrard's Inlet, Br. Columbia, C. Wood; dredged in 10 fathoms in sea water, sp. gr. 1·016, a low sp. gr. caused by admixture of water from the melted snows of the surrounding mountains. Sp. gr. in Straits of Georgia, 1·026, C. Wood.

Some of the specimens are of ordinary breadth; others are of the widest variety constituting the *D. herbacea* of authors (*Fucus herbaceus*, Turn. t. 99).

8. *Carpomitra Cabrerae*, Kütz; Harv. Phyc. Brit. t. 14.

Fuca Strait, Dr. Lyall.

A new and unexpected habitat for this local plant. Dr. Lyall's solitary specimen is in fruit, and does not materially differ from British specimens.

9. *Macrocystis pyrifera*, Ag.; Harv.; Ner. Bor. Amer. i. p. 84.

Fuca Strait and outer sea-coast; Esquimalt, Dr. Lyall.

10. *Nereocystis Lütkeana*, Post. & Rupr. Illustr. t. 8, 9; Ner. Bor. Amer. i. p. 85.

Rocks at low water; Esquimalt and Fuca Strait, Dr. Lyall; dredged in Burrard's Inlet, in 10 fathoms, C. Wood.

Besides a large specimen sent in a cask to the Kew Museum,

Dr. Lyall has communicated numerous well-dried herbarium specimens of the young plant, which well illustrate the progressive development of the frond. The youngest specimen sent has a stem two inches long, tipped by a bulbous vesicle 2–3 lines in diameter, carrying at its summit two falcate-lanceolate leaves, which show a tendency to split from the base upwards, the line of future separation being indicated nearly to the middle of each leaf. In the next stage the stem has grown but little; but the apical bulb has attained the diameter of 4–5 lines, and the two leaves have, by medial splitting, become four, of which two are perfectly free, and two still connate for a short space near the base—thus showing (as is also more clearly seen in older plants) that the fissure takes place both from the base upwards and from the apex downwards. Other specimens, in which the stem is 6–8 inches long, the bulb 1–1½ inch in diameter, and the leaves 14–16 inches long, are not more advanced in subdivision than the first here described. The age and size at which splitting begins probably depend on the depth at which a specimen grows, those in shallow water beginning to divide at an earlier age. All after-growth consists in the lengthening of the stem till it reaches from 200 to 300 feet, in the increasing size and hollowing out of the apical vesicle till it becomes six feet or more in length, and in the multiplication of leaves, by continual bisection, until there results a huge, geminate tuft of foliage, always separated at base into two distinct bundles by the true apex of the vesicle, from which no leaves spring. Eventually each leaf is 20–30 feet long. In Dr. Lyall's larger herbarium specimens there are eight leaves, each partially bisected.

11. *Alaria Pylaii*, *Grev.*; *Harv.*; *Ner. Bor. Amer.* i. p. 89.

On stones at the mouth of the Esquimalt Harbour and St. Juan de Fuca, *Dr. Lyall & C. Wood.*

Most of the specimens are immature. The few that produce pinnæ have them broadly obovate, broader in proportion to their length than on specimens from Newfoundland. In other respects the plants agree.

12. *Alaria marginata*, *Post. & Rupr.?* *Harv.*; *Ner. Bor. Amer.* i. p. 89.

Esquimalt Harbour, &c.

The specimens are immature, without pinnæ, though some are of large size, 5–6 feet long. Even in the youngest state, this differs from the preceding by the very broad midrib, 1–1½ inch wide in fronds where the stipes is 3–4 lines wide; and half-an-inch wide in younger fronds, with stipes two lines wide.

13. *Costaria Turneri*, Grev. (*C. Turneri* and *C. Mertensii*, *J. Ag. Sp. Algæ*, i. p. 139, 140; *Harv.*; *Ner. Bor. Amer.* i. p. 90.)
Rocks at low water; Fuca Strait and Esquimalt, *Dr. Lyall*.

The numerous and beautifully preserved specimens sent vary with fronds cordate-ovate, ovate, ovato-lanceolate, and lanceolate, these forms passing insensibly one into another. The largest sent by *Dr. Lyall* are upwards of a foot wide and $2\frac{1}{2}$ feet long, and are frequently perforated toward the base. When full-grown, the fronds measure 10–12 feet in length.

14. *AGARUM FIMBRIATUM*, n. sp. Stipite compresso-plano demum fimbriato-pinnato, costa latiore continuato, lamina membranacea bullata hic illic foraminibus irregularibus raris pertusa, basi subcordata, margine crispato eroso-fimbriato.

Dredged in 4–10 fathoms; Esquimalt Harbour, *Dr. Lyall & C. Wood*.

Stipes 1–2 inches long, flattened, 3–4 lines wide, at first simple, afterwards pinnated with horizontally patent, root-like, subulate processes, continued through the frond as an immersed costa, 4–6 lines wide. Fronds 2–3 feet long, $1-1\frac{1}{2}$ wide, cordate at base; the margin strongly curled, and in all the older specimens jagged and fimbriated with irregular excurrent processes. The younger fronds are very much blistered (bullated), but have few foramina. The older are irregularly perforated with holes of unequal size and different shape, more abundant toward the margin. This must be near *A. pertusum*, P. & R., but differs in the fimbriated margin and stipes, if these be constant characters. More specimens are needed to ascertain this point.

15. *Laminaria saccharina*, Ag.; *Harv.*; *Ner. Bor. Amer.* i. p. 92.
Esquimalt Harbour, &c., common, *Dr. Lyall*.

Of this common plant many varieties are sent; some with very broad, others with narrow fronds, both varying greatly in proportionate length to breadth. Some have *strictly ovate* fronds, not more than once and a half as long as broad; others *ovato-lanceolate*, four times as long as broad; and others *lanceolate* and *linear-lanceolate*, many times as long as broad. One has a nearly *orbicular* frond! The substance varies from membranous to coriaceous, and the colour from olive-green to dark brown.

16. *Laminaria dermatodea*, *De la Pyl.*; *Ner. Bor. Amer.* p. 92.
Fuca Strait and Esquimalt, *Dr. Lyall & C. Wood*.

A series of specimens, young and mature. The younger and uncloven specimens differ from *L. saccharina* in their flattened,

widened-upward stipe and less wavy frond ; the mature ones from *L. digitata* in the stipe, &c.

17. *LAMINARIA APODA*, n. s. Stipite nullo !, lamina basi calloso-radicante late cordata coriacea demum apice in lacinias numerosas plus minus fissa v. omnino multipartita, radice ramosissima.

Rocks between tide-marks, Fuca Strait, *Dr. Lyall*.

Frond originating in a callus (or bulbiform stipe) attached to the rocks by many branching fibres, as in other species. Lamina sessile, a foot wide or more, 1-2 feet long (or more ?), cordate at base, ovate or ovato-lanceolate in outline, coriaceous, at first probably undivided, but in all our specimens more or less split, as in *L. digitata*. Some are cleft quite to the base into many narrow segments. A very remarkable species, characterized by the absence of stipe, unless the hardened and thickened base of the lamina be so called. Some specimens of *L. dermatodea* have very short stipites, not more than half an inch long ; and such serve to link our present plant with the stipitate species.

18. *Laminaria fascia*, *Ag.* ; *Harv. Ner. Bor. Amer.* i. p. 91.

Esquimalt and Fuca Strait, *Dr. Lyall & C. Wood*.

19. *Striaria attenuata*, *Grev.* ; *Harv. Ner. Bor. Amer. (Suppl.)* iii. p. 123.

Orcas Island, Vancouver, *Dr. Lyall*.

20. *Chorda lomentaria*, *Grev.* ; *Harv. Ner. Bor. Amer.* i. p. 98.

In rock-pools, Esquimalt and Fuca Strait, *Dr. Lyall*.

21. *ECTOCARPUS OVIGER*, n. sp. Filis (3-5-uncialibus) decompositoramosissimis viridibus, ramis ramulisque alternis v. secundis erectis, ultimis longiusculis vagis, sporis ovoideis ad ramos subsessilibus sæpe secundis.

Hab. Stems of *Nereocystis* ; Esquimalt, *Dr. Lyall*.

This has the aspect of *E. littoralis*, Ph. Br. (*E. firmus*, J. Ag.), but differs in the fruit, which is abundant in our specimens, and very like that of *E. granulatus*, from which our *E. oviger* differs in ramification.

22. *Ectocarpus littoralis*, *Ner. Bor. Amer.* i. p. 139.

On rocks and Fuci, Fuca Strait and Esquimalt, *Dr. Lyall & C. Wood*.

23. *Ectocarpus siliculosus*, *Lyngb.* ; *Ner. Bor. Amer.* i. p. 139.

On stems of *Nereocystis*, Esquimalt, *Dr. Lyall*.

24. *Ectocarpi* sp.

Nanaimo, on rocks, *Dr. Lyall*.

Not in fruit, and overgrown with parasites ; may be a var. of *E. littoralis*.

RHODOSPERMEÆ.

25. *Rhodomela larix*, *Ag.*; *Harv. Ner. Bor. Amer.* ii. p. 24.

On rocks and drifted, Fuca Strait; Point Roberts; Esquimalt; St. Juan de Fuca, *Dr. Lyall & C. Wood.*

26. *Rhodomela floccosa*, *Ag.*; *Harv. Ner. Bor. Amer.* ii. p. 24.

Fuca Strait and Point Roberts, *Dr. Lyall & C. Wood.*

27. RHODOMELA LYALLII, n. sp. Fronde valde compressa elata decomposita pinnata disticha, pinnis pinnulisque in ambitu lanceolatis, ramulis subulatis alternis brevibus, ceramidiis ovatis subsessilibus stichidiisque racemulosis.

Adrift on the beach, Fuca Strait, *Dr. Lyall.*

12–20 inches high, regularly pinnate 3–4 times, all the divisions lanceolate (not corymbulose or fastigiata) in outline; the ramuli of the minor pinnules subequal, the lowest not conspicuously longer than the rest. In fruit, every ramulus of each ultimate plumule is generally converted into either a conceptacle or a stichidium, without any shortening of the rachis; hence the arrangement is racemulose, rather than corymboso-fasciculate, by which character, together with the larger size, more compressed frond, and more regular ramification, this plant differs from *R. floccosa*.

28. *Odonthalia angustifolia*, *Suhr.?*

On the beach, Esquimalt, *Dr. Lyall.*

29. *Chondria atro-purpurea*, *Harv. Ner. Bor. Amer.* ii. p. 22, t. 18. E.

Fuca Strait, *Dr. Lyall.*

30. *Polysiphonia dendroidea*, *Mont. Syllog.* p. 421, No. 1491; *Fl. Boliv.* p. 16, t. 5. f. 1.

Dredged in 10 fathoms, and cast ashore, Esquimalt, *Dr. Lyall.*

Nearly allied to *P. parasitica* and *P. pennata*, but more robust.

31. *Polysiphonia atrorubescens*, *Grev.*; *Harv. Ner. Bor. Amer.* ii. p. 40; *Ph. Br.* t. 172.

Esquimalt, and Fuca Strait, dredged in 10 fathoms, and cast ashore, *Dr. Lyall.*

Var. β . *minor*. Filis tenuioribus brevioribusque; Orcas Island, *Dr. Lyall.*

32. *Polysiphonia Californica*, *Harv. Ner. Bor. Amer.* ii. p. 48.

Esquimalt, &c., common, *Dr. Lyall.*

A very abundant species. The herbarium contains upwards of 100 specimens of all sizes, from 1 to 10–12 inches high. The more pinnated specimens pass, by slight changes, into the following. Perhaps all might be united with *P. gemmifera*, P. & R.

33. POLYSIPHONIA CALIFORNICA, var. β . PLUMIGERA. Filis rigidiusculis distanter ramosis, ramis primariis alternis infra longe nudis supra crebre alterne plumuligeris; plumulis bi- tri-pinnatis subfasti-

giatis, pinnulis ultimis flexuoso-alternis subulatis erecto-patentibus; articulis 14-16-siphoniis, ramorum diametro 8-12-plo v. multoties longioribus, ramulorum diametro æqualibus v. vix brevioribus.

Sandy beach near low water, Point Roberts, lat. 49° N., *Dr. Lyall*.

Filaments 5-6 inches long, flaccid, but not softening, sparingly divided into a few, long, naked primary branches, which sometimes have one or two small subulate ramuli below, and are closely set near the apex with bi-pinnate branchlets or plumules. Each plumule is 3-4 lines long and 2-3 broad, with a circumscribed outline. Colour, brown-red. A distinctly marked form, but not specifically different from the common *P. Californica*.

34. *Polysiphonia urceolata*, *Grev.*; *Harv. Ner. Bor. Amer.* ii. p. 32; *Ph. Br.* t. 167.

Esquimalt; Fuca Strait; Point Roberts: common.

35. *POLYSIPHONIA SENTICULOSA*, n. sp. Filis 2-3-uncialibus pellucide articulatis capillaribus mollibus cæspitosis siccitate badiis decomposite ramosissimis, ramis alternis secundisve bis terve divisis, secundariis strictis virgatis ramuliferis, ramulis brevibus subuliformibus alternis erecto-patentibus, articulis 4-siphoniis ramorum diametro 4-6-plo longioribus, ramulorum diametro æqualibus v. brevioribus.

Orcas Island, *Dr. Lyall*.

36. *Laurencia pinnatifida*, *Lamour.*; *Harv. Ner. Bor. Amer.* ii. p. 70; *Ph. Br.* t. 55.

Low-water rocks, St. Juan de Fuca Strait, *C. B. Wood*; Victoria Harbour, *Dr. Lyall*.

37. *Amphiroa Californica*, *Deane*; *Harv. Ner. Bor. Amer.* ii. p. 86.

Imbedded in roots of *Laminariæ*, Fuca Strait, *Dr. Lyall*.

38. *Amphiroæ* sp. indeterminata.

St. Juan de Fuca, S.W., *C. Wood*; Esquimalt, *Dr. Lyall*.

39. *Amphiroa corymbosa*, *Harv. Ner. Austr.* p. 99. t. 38.

Fragments only.

40. *AMPHIROA (ARTHROCARDIA) EPIPHLEGNOIDES*, *J. Ag. MSS.*, *fide Lenorm.* Fronde dichotoma v. vage ramosa flabelliformi, articulis difformibus, aliis oblongis vix compressis v. teretibus, aliis cuneatis v. polyhedris margine obtusis, ceramidiis paucis articulis latioribus insidentibus.—*A. rudis*, *Harv.* in *Herb. D.C.D.*

Rocks near low-water mark, Fuca Strait, *Dr. Lyall*.

3-4 inches long. Lower and some of the upper joints like those of *Corallina officinalis*; the medial generally broad, short, and compressed, triangular or oblate, always rounded at the edge. A native also of Tahiti.

41. *CORALLINA OFFICINALIS*, *L.*; *Harv. Ner. Bor. Amer.* ii. p. 83.

Rocks between tide-marks, Esquimalt, *Dr. Lyall*.

42. *Delesseria hypoglossum*, var. *arborescens*, *Lamour.*; *D. arborescens*,
De la Pyl.

Fuca Strait, *Dr. Lyall.*

Fine specimens, not unlike some from the North of Ireland, or the "*D. arborescens*" of the French coast.

43. *Delesseria alata*, *Lamour.*, var. *latissima*.

On stems of *Nereocystis*, *Dr. Lyall.*

The fronds, though evidently not fully developed, are of extraordinary width; the broadest $\frac{1}{2}$ — $\frac{3}{4}$ inch, the narrower $\frac{1}{4}$ inch wide.

44. *Hymenena fimbriata*, *P. & R.*; *Harv. Ner. Bor. Amer.* ii. p. 102.

On the beach, Victoria Harbour; Esquimalt, *Dr. Lyall & C. Wood.*

45. HYMENENA LATISSIMA, n. s. Fronde latissima, juniore flabelliformi, adulta vage partita v. laciniata infra venulosa sursum subavenia, laciniis latissime cuneatis v. flabellatis inciso-lobatis, lobulis rotundatis, cystocarpiis sparsis, soris totam frondem demum percurrentibus.

Esquimalt Harbour, dredged and adrift, *Dr. Lyall, C. Wood.*

Fronds 12–15 inches long and wide, variously cleft, the segments fan-shaped, cut at the apex into many, short, round-topped lobes. The lower half of the frond is traversed with many conspicuous, subparallel, anastomosing veins; the upper apparently nerveless, until the tetrasporic fruit is formed, when the interspaces of the sori indicate the lines of nervation; and in older specimens anastomosing nerves may be clearly traced, even to the extremities. Colour, a bright red. The herbarium contains specimens with both kinds of fruit; but the bulk of those sent are without fructification, and consequently not clearly distinguishable from a *Nitophyllum*.

46. *Nitophylli*? v. *Hymenena* species?

Victoria Harbour, in deep water, *Dr. Lyall.*

Specimens without fruit, much torn, and proliferous from the wounds, and therefore not determinable. Some look as if they belonged to *Nitophyllum laceratum*, and others like a divaricated state of *Hymenena*.

47. *Gracilaria confervoides*, *Grev.*; *Harv. Ner. Bor. Amer.* ii. p. 108.

Esquimalt, *Dr. Lyall.*

A deep-water variety, very much resembling, in ramification and aspects, our *Cystoclonium gracilarioides*, but quite distinct in structure.

48. *Rhabdonia Coulteri*, *Harv. Ner. Bor. Amer.* ii. p. 154, t. 23. B.

Esquimalt, *C. B. Wood.*

A single specimen, in fruit (*cystocarpia*).

49. *Plocamium coccineum*, *Lyngb.*; *Harv. Ner. Bor. Amer.* ii. p. 153.
Dredged in 6-8 fathoms, Esquimalt, *Dr. Lyall*; low-water rocks,
Fuca Strait, *C. Wood*.

Apparently common; several specimens sent.

50. *Rhodymenia pertusa*, *J. Ag.*; *Harv. Ner. Bor. Amer.* ii. p. 147.
Cast ashore, Point Roberts; and on rocks at low water, Fuca Strait,
Dr. Lyall.

Fine specimens; some with *cystocarpia*.

51. *Rhodymenia palmata*, *Grev.*; *Harv. Ner. Bor. Amer.* ii. p. 148.
On rounded pebbles, on an exposed beach, Esquimalt, *Dr. Lyall*. Also
cast ashore, and on rocks at low water, in Fuca Strait, *Dr. Lyall*.

Common, and quite like the ordinary broad-leaved European
form.

52. *Rhodymenia corallina*, *Bory?*
Dredged in 14 fathoms, St. Juan de Fuca, *Dr. Lyall*.

Fragments, apparently of this species.

53. *Rhodymenia palmetta*, *Grev.*; *Harv. Ner. Bor. Amer.* ii. p. 149.
Fuca Strait, on stones, *Dr. Lyall*.

A single specimen.

54. *Ahnfeldtia plicata*, *J. Ag.*; *Harv. Ner. Bor. Amer.* ii. p. 168.
Esquimalt, and Fuca Strait, *Dr. Lyall*.

55. *Gymnogongri* species.
Esquimalt, *Dr. Lyall*.

One small specimen with *favellidia*. It agrees in several re-
spects with *G. linearis* (*Turn. Hist. Fuc.* t. 220), but is much
smaller and more ramulous, and may be distinct.

56. *CYSTOCLONIUM GRACILARIOIDES*, n. sp. Fronde longissima sim-
pliciuscula crassa alterne v. vage v. secunde ramosa, ramis cylindraceutis
basi vix attenuatis simplicibus omnino nudis v. ramulos perpaucos
ferentibus, cystocarpis?

Dredged in 10 fathoms, Esquimalt Harbour, *Dr. Lyall*.

Fronds 12-18 inches long, 1-1½ lines in diameter; very like the
cord-like varieties of *Gracilaria confervoides*, but with the cellular
structure proper to *Cystoclonium*. Lateral branches numerous,
5-6 inches long, patent, quite simple, mostly naked, rarely with a
few ramuli. Fruit a desideratum.

57. *CALLOPHYLLIS FLABELLULATA*, n. s. Fronde pusilla (1-4-unciali)
flabelliformi coccinea subdichotome v. digitatim multipartita et fas-
tigiata, laciniis linearibus raro cuneiformibus patentibus sensim an-

gustioribus, apicibus acutis, cystocarpiis in discum v. ad marginem laciniarum sessilibus.

Dredged in 8–10 fathoms, and cast ashore, Esquimalt, *Dr. Lyall*.

The smaller specimens so exactly resemble *Euthora cristata*, that it is difficult to persuade oneself, without dissection of frond and fruit, that they belong to a different genus. The larger look like small varieties of *Callophyllis variegata*, and yet are not identical; some very narrow ones are equally like the narrow and dwarf states of *C. coccinea*. The colour is a bright red. The substance is somewhat rigid, but very imperfectly adhering to paper. The average width of the segments is 1–2 lines.

58. *Callophyllis variegata*, Kütz. *Sp. Alg.* p. 745.

Open beach, Esquimalt, *Dr. Lyall*.

A few small specimens. They are less fastigate and broader than *C. flabellulata*, with more cuneate and obtuse or truncate segments, and of much softer substance.

59. *Callophyllis laciniata*, Kütz.; *Harv. Ner. Bor. Amer.* ii. p. 171; *Ph. Br.* t. 121.

Esquimalt, *Dr. Lyall*.

Fragments only.

60. *Constantinea Sitchensis*, *Post. & Rupr.*; *Harv. Ner. Bor. Amer.* ii. p. 173.

Adrift on the beach, Victoria Harbour, *Dr. Lyall*.

Perhaps this is only a luxuriant state of *C. rosa-marina*. The lamina in our specimens is torn, but must have been 6–8 inches in diameter when perfect.

61. *Kallymenia reniformis*, *J. Ag. Sp. Alg.* ii. p. 286.

Dredged in Esquimalt Harbour, 10 fathoms, *Dr. Lyall*.

A single specimen.

62. *Gigartina radula*, *J. Ag.*; *Harv. Ner. Bor. Amer.* ii. p. 178.

Fuca Strait and Victoria Harbour, *Dr. Lyall*, *C. Wood*.

63. *Gigartina mamillosa*, *J. Ag.*; *Harv. Ner. Bor. Amer.* ii. p. 175.

Var. *a. vulgaris*. Repetite ramosa, laciniis angustis cuneatis linearibusve.

Var. *β. latissima*. Parce dichotoma, laciniis latissime cuneatis truncatis.

Esquimalt Harbour, *Dr. Lyall*.

Between the broadest and simplest and the narrower forms there seems a direct passage; nor can I distinguish such varieties, more than similar states of *Chondrus crispus*. I have seen no authentic specimen of Agardh's "*G. papillata*" (from the Sandwich Islands); but his description agrees well with the broader and simpler of the Esquimalt specimens.

64. *Gigartina mollis*, *Bail. & Harv.*; *Harv. Ner. Bor. Amer.* ii. p. 175.
Rocks at low water, Fuca Strait, and dredged in 5 fathoms, *Dr. Lyall*.

65. *Chondrus affinis*, *Harv. Ner. Bor. Amer.* ii. p. 181.
Esquimalt, *Dr. Lyall*.

66. *Iridæa cordata*, *J. Ag.*; *Turn. Hist.* t. 116; *Ner. Bor. Amer.* ii. p. 180.
Esquimalt and Fuca Strait: common, *Dr. Lyall*.

Many specimens, of various ages, extremely varied in form; some with strictly cordate base, and others gradually passing off toward the obovate basally attenuated form called *I. laminarioides*. Substance in the younger plants thin and glossy, bright purple; in the older thick and fleshy, dull red-brown.

67. *Endocladia muricata*, *J. Ag.*; *Harv. Ner. Bor. Amer.* ii. p. 182,
t. 28. B.

Rocks between tide-marks; Esquimalt, *Dr. Lyall*; in 5–9 fathoms,
C. Wood.

68. *Halymenia ligulata*, *J. Ag.*; *Harv. Ner. Bor. Amer.* ii. p. 192.
Esquimalt Harbour, 4–6 fathoms, *Dr. Lyall*.

Two specimens only; a broad, flat, nearly regularly dichotomous form.

69. *Halosaccion hydrophora*, *Ag.*; *Harv. Ner. Bor. Amer.* ii. p. 194.

Esquimalt, on rocks and in tide-pools, *Dr. Lyall*; on floating wood,
C. Wood.

Old fronds 10–12 inches long, 1–1½ inch in diameter. Injured specimens are frequently proliferous from the wound, or the broken sac throwing out numerous sacs from the side.

70. *PRIONITIS LYALLII*, n. sp. Fronde polymorpha membranaceo-coriacea siccitate badia sæpissime plana plus minus pinnatim et dichotome ramosa; nunc subsimplici lanceolata pinnis lanceolatis utrinque marginata; nunc ramosissima, ramis lineari-cuneatis, basi longe angustatis margine foliiferis pinnulatisve, pinnis ciliæformibus; nunc di-pollachotoma laciniis linearibus patentibus apicibus acutis v. explanatis.

Esquimalt, on tidal rocks and rock-pools, *Dr. Lyall*; Fuca Strait,
C. B. Wood.

Between extreme states of this most variable species nothing but an extensive suite of specimens can suggest a connexion; and yet I find it impossible to fix limits to the following varieties:—

Var. *a. lanceolata*. Fronde 12–14 uncias longa, unciam lata, subsimplici lanceolata, pinnis minoribus foliaceis marginata et e disco prolifera.

Var. *β. ornata*. Caule compresso-filiformi tenui parce ramoso, ramis latissimis 6–8 uncias longis margine et disco foliiferis.

Var. *γ. normalis*. Fronde ramosissima digitato-pinnatim ramosa, ramis majoribus minoribusque lineari-cuneatis, basi angustatis, 2–4 uncias

longis, 3-5 lineas latis, plus minus margine pinnulatis, pinnulis subhorizontalibus anguste linearibus v. apice dilatatis.

This seems to be the central or typical form of the species. The larger fronds are 12-14 inches in the expansion of the branches.

Var. δ . *densissima*. Fronde creberrime ramosissima pluries pinnatim ramosa, pinnis pinnulisque linearibus basi angustatis.

A narrower and more densely branched state than the preceding.

Var. ϵ . *intermedia*. Fronde ramosissima angustata, ramis superioribus plus minus dilatatis.

Between δ & ζ .

Var. ζ . *dilatata*. Fronde plus minus ramosa vix pinnulata, ramis superioribus dilatatis foliaceisve lanceolatis.

Var. η . *depauperata*. Parvula, debilis, sæpius di-pollachotoma et fastigiata.

Numerous other minor and connecting states might be named.

71. PRIONITIS LANCEOLATA? var. FILICINA. Fronde creberrime bitripinnata, pinnis pinnulisque horizontalibus.

On rocks, Esquimalt, *Dr. Lyall*.

Two specimens only. In substance, colour, and structure these specimens agree with the Californian *P. lanceolata*, than which, however, they are much more densely branched and more pinnated. I do not venture to propose them as specifically different.

72. Schizymenia Dubyi, *J. Ag.*; *Harv. Ph. Br.* t. 123.

On rounded pebbles, on an exposed beach, Esquimalt, *Dr. Lyall*.

Very similar to some of the larger English specimens.

73. Schizymenia Mertensiana, *P. & R.*? *J. Ag. Sp.* ii. p. 174.

Adrift, Victoria Harbour, *Dr. Lyall*.

A fragment only. The substance resembles parchment.

74. SCHIZYMENIA? COCCINEA, n. sp. Fronde.....maxima rubro-coccinea gelatinoso-membranacea tenui, siccitate chartæ arcte adhærente, structura laxa, filis medullaribus paucis arachnoideis.

Dredged in 14 fathoms, Griffin Bay, St. Juan Island, *Dr. Lyall*.

Fragments only, from which the outline can be but vaguely guessed at. The largest piece is about 16 inches long and a foot wide, and presents a bright-crimson, glossy, soft membrane closely adherent to paper. Its cellular structure is rather that of *Halymania*; but the habit is more that of *Schizymenia*, where I provisionally place it.

75. Gloiosiphonia capillaris, *Carm.*; *Harv. Phyc. Bor.* t. 57.

On stems of *Nereocystis*, *Dr. Lyall*.

Two specimens only.

76. *Microcladia Coulteri*, *Harv. Ner. Bor. Amer.* ii. t. 33. A.
Rocks at low water, Esquimalt, *Dr. Lyall*.
77. *Microcladia borealis*, *P. & R.*; *Harv. Ner. Bor. Amer.* ii. p. 210.
Rocks at low water, Fuca Strait, *Dr. Lyall*.
78. *Ceramium cancellatum*, *Ag.*
Rocks and larger Algæ, at low water, Esquimalt, *Dr. Lyall*.
79. *Ceramium rubrum*, *Ag.*; *Ner. Bor. Amer.* ii. p. 213.
Esquimalt, *Dr. Lyall*.
80. *Ceramium diaphanum*, *Ag.*; *Ner. Bor. Amer.* ii. p. 215.
Rock-pools, Esquimalt and Port Roberts, *Dr. Lyall*.
81. *Ceramium tenuissimum*, *Ag.*; *Ner. Bor. Amer.* ii. p. 216. (*C. nodosum*, *Kütz.*)
Dredged in 10 fathoms, Esquimalt, *Dr. Lyall*.
82. *Ptilota Californica*, *Rupr.*; *Ner. Bor. Amer.* ii. p. 222.
Esquimalt, *Dr. Lyall*.
Fragments only, much battered.
83. *Callithamnion arbuscula*, *var. Pacificum*. (*C. Pikeanum*, *Harv. Ner. Bor. Amer.* ii. p. 230.)
Tidal rocks, Esquimalt, *Dr. Lyall*.
The specimens so nearly coincide with Orkney specimens of the European *C. arbuscula* that I cannot keep them specifically apart. The branching of the ramuli is less pectinate and more regularly pinnate than in the specimen from California on which my "*C. Pikeanum*" was founded.
84. *Callithamnion polyspermum*, *Ag.*; *Harv. Ner. Bor. Amer.* ii. p. 234.
On rocks, Esquimalt, *Dr. Lyall*.
85. *Callithamnion thuyoideum*, *Ag.*; *Phyc. Brit.* t. 269.
On dead shells, in 10 fathoms, Esquimalt, *Dr. Lyall*.
There are several specimens of this elegant species, very closely similar to those from the West of Ireland, in *Herb. T. C. D.* One of *Dr. Lyall's* shows a tendency to pass into "*C. tripinnatum*" or *C. gracillimum*.
86. *Callithamnion Americanum*, *Harv. Ner. Bor. Amer.* p. 238, t. 36. A.
On stems of *Nereocystis*, and dredged in 8-10 fathoms, Esquimalt, *Dr. Lyall*.
87. *Callothamnion subulatum*, n. sp. Fronde rigidiuscula erecta alterne decomposita ramosissima, ramis ramulisque opposite pinnatis; pinnis subulatis acutissimis, junioribus nudis, adultis basi intus ramulo multifido auctis demum fasciculato-ramulosis; tetrasporis triangule divisus ad ramulos secundarios sessilibus.
On small stones, sandy beach, Esquimalt, *Dr. Lyall*.
More rigid than *C. Americanum*, but seemingly intermediate

between the less ramulose states of that species and the following. The larger are 6-8 inches long and broad, their divisions having a pyramidal outline.

88. *CALLITHAMNION FLOCCOSUM*, var. *PACIFICUM*. Pinnis omnibus longis filiformi-subulatis simplicissimis.

On stems of larger Algæ, Orcas Island and Esquimalt, *Dr. Lyall*.

Much more densely branched and with much longer pinnæ than the usual Atlantic variety, and with more the aspect of *C. Americanum*; but some Scotch specimens in Herb. T. C. D., by the length of their pinnæ and general habit, come near the present.

CHLOROSPERMEÆ.

89. *Codium tomentosum*, *Harv. Ner. Bor. Amer.* iii. p. 29.

Esquimalt Harbour, &c., on rocks, *Dr. Lyall*.

90. *Porphyra vulgaris*, *Ag.*; *Ner. Bor. Amer.* iii. p. 53.

On rocks and Algæ, Esquimalt, &c., common.

Several varieties. Some are 3-4 feet long, and 1 foot wide; others are beautifully marbled with green and purple.

91. *Enteromorpha compressa*, *Link*; *Harv. Ner. Bor. Amer.* iii. p. 57.

On rocks and dredged, Esquimalt, &c., very common.

92. *Enteromorpha intestinalis*, *Link*; *Ner. Bor. Amer.* iii. p. 57.

Strait of Georgia, in 8 fathoms, *C. B. Wood*.

93. *Ulva latissima*, *Linn.*; *Ner. Bor. Amer.* iii. p. 59.

Esquimalt, &c., common.

94. *Ulva fasciata*, *Del.*; *Ner. Bor. Amer.* iii. p. 58.

Pools between tide-marks, outer sea-coast and adrift, *Dr. Lyall*.

95. *Ulva rigida*, *Ag.*

Esquimalt, *Dr. Lyall*.

96. *Ulva Linzæ*, *Ag.*; *Ner. Bor. Amer.* iii. p. 59.

Rock-pools, Esquimalt and Orcas Island, *Dr. Lyall*.

97. *Vaucheriæ* sp.

In running streams, Esquimalt and Lake Schweltza, *Dr. Lyall*.

The species is not determinable from dried specimens.

98. *Batrachospermum moniliforme*, *Ag.*

Stones in running streams, Chilukweynk Valley, *Dr. Lyall*.

99. *Cladophora arcta*, *Phyt. Br.* t. 135; *Ner. Bor. Amer.* iii. p. 75.

Orcas Island, Esquimalt, &c., *Dr. Lyall* & *C. Wood*.

100. *Cladophora glaucescens*, *Griff.*; *Ner. Bor. Amer.* iii. p. 77.

Nanaimo, Vancouver's Island, *C. Wood*.

101. *Cladophora lætevirens*, *Dillw.*; *Ner. Bor. Amer.* iii. p. 82.

Fuca Strait, *Dr. Lyall*.

Young specimens, about an inch in height.

102. *Cladophora glomerata*, *Linn.*; *Ner. Bor. Amer.* iii. p. 84.

Lake Scheveltza, *Dr. Lyall*.

103. *Conferva rivularis*, *Ag.*

In running streams, Sumas Prairie, Br. Columbia, *Dr. Lyall*.

104. *Conferva floccosa*, *Ag.*

In pools above high water, Esquimalt, *Dr. Lyall*.

105. *Zygnematis* sp.

Pools, Esquimalt.

A moderately robust species, with short joints.

106. *Hormotrichum Carmichaelii*, *Harv.*; *Ner. Bor. Amer.* iii. p. 90.

Rock-pools between tide-marks, Fuca Strait, *Dr. Lyall*.

107. *Hydrurus penicillatus*, *Ag.*; *Ner. Bor. Amer.* iii. p. 118.

On stones in streams, Chilukweynk Valley, *Dr. Lyall*.

On the Discovery of *Gladiolus Illyricus* (Koch) in the Isle of Wight. By ALEXANDER G. MORE, F.L.S.

[Read April 3, 1862.]

THROUGH the kindness of my friend the Rev. E. Venables, I have lately obtained the loan of a specimen and drawing of a wild *Gladiolus* gathered by a lady near Shanklin, in the Isle of Wight; and in answer to some inquiries addressed to her, Mrs. Phillipps, the discoverer, has informed me that it was found growing in the midst of a wild tract of copse and heath, called the "Apse" or "America" woods. Only one plant was noticed: it was in bud on the 7th of July 1855, and, having been carried home, afterwards flowered, when the drawing was made.

The *Gladiolus* found at Shanklin evidently belongs to the same species as that which grows in the New Forest, as I have ascertained by comparing Mrs. Phillipps's specimen with a series collected at Lyndhurst, by Mr. John T. Syme; but in the characters afforded by the stigma, whose lobes are suddenly (not gradually) enlarged upwards, the English plant from both localities appears to agree better with *Gladiolus Illyricus* (Koch) than with either *G. imbricatus* (Linn.) or *G. communis* (Linn.); and I therefore venture to propose a change of name, which, I am glad to say, has the approval of my friend Professor Babington, who further allows

me to state that he finds the English *Gladiolus* to agree exactly with Continental specimens of *G. Illyricus* issued by C. Billot.

Gladiolus communis (Linn.) is a much larger plant, and is easily distinguished from the other two species by its larger flowers and much stouter leaves. The range also of *G. communis* appears to be more exclusively southern in Europe.

It will be remembered that Dr. Arnott, in the latest edition of the British Flora, treats "*Gladiolus communis*" as an introduced plant. Mr. Bentham, also in his 'Handbook,' writes, "Possibly accidentally introduced;" but I believe that the occurrence of *Gladiolus Illyricus* in the Isle of Wight supplies an important link in support of its being indigenous to Britain.

There can be no doubt as to the identity of the present specimen. Fortunately, the finder noted down the date in her journal at the time, and made a drawing of the plant while it was still fresh. Further, there is a tradition on the spot: it has long been known to the inhabitants of a neighbouring farm-house that a wild *Gladiolus* grows in the woods at Shanklin.

The specimen now exhibited was found in the middle of the wood, in a spot remote from cottages; nor am I aware that *G. Illyricus* is at all cultivated as a garden-flower.

The nature of the British stations (heaths and heathy woods) agrees perfectly with what is known of the place of growth of *G. Illyricus* in the north-west of France.

If *G. Illyricus* appears to belong to the south and west of Europe, its position in Britain is not unlike that of several other species which, though absent from North and Middle Germany, extend along the shores of the Atlantic as far as the British Isles. *Arum Italicum*, *Rubia peregrina*, *Cyperus longus*, *Agrostis setacea*, &c. will readily occur as examples of this; and no doubt all these plants are influenced by the comparative mildness of the maritime climate of the west of Europe.

If very rare in Hampshire and in the Isle of Wight, *G. Illyricus* is also said to be exceedingly scarce in the Loire district of France, as indeed might be expected from its outlying position in both countries, where we may suppose it to be at the extreme limit of its range.

It is hoped that any botanist who may succeed in discovering other plants at Shanklin will not fail to publish the details, since, however great the geographical probabilities of its wildness, it would be very desirable to have more than a single root to vouch for *Gladiolus Illyricus* being indigenous to the Isle of Wight.

Florula Mallica. By M. P. EDGEWORTH, Esq., F.L.S.

[Read May 1, 1862.]

THE paper which I now offer to the Society is the result of my botanical observations in the Multan division of the Punjab, where the Malli resided in the time of Alexander. During an official residence of five years, I have visited every portion of it, but unfortunately not always at the most favourable season for botany; therefore further explorations may add some other species to the somewhat meagre flora now to be described, particularly in the northern portion. It is, however, interesting as a region of botanic geography osculating between that of the North-west of India and that of Sindh and Arabia.

The Multan division, comprising the districts of Jhung, Gogaira, and Multan (15,494 square miles, of which only 1221 are cultivated), is a tolerably natural one as a botanical sub-section. It is triangular, bounded on the south by the Sutlej, on the west by the Jhilum and the Chenab after their junction, except for a short distance, where the boundary is the edge of the Sandy Desert (or Thall) of the Sind Sāgar Doab, on the north-east by an irregular line running from Kot Isa Shah across the Vichan Doab (often termed by us, though not by the inhabitants, the Chaj or Jech) to a little above Chandniot, and thence in a nearly straight line to the Sutlej, nearly opposite Mamdot. It thus embraces some of the detached hills which form the remarkable ranges which shoot up suddenly out of the plain, rising to the height of 1000 feet at Kirana in the Vichan Doab, and finally descend near Shahkot in the Rechnab. Those near Chandniot are about 400 feet, and at Shahkot not about 150. They consist of sandstone and slate, and are very barren.

Thus the division consists of the lower extremities of the three Doab—the Vichan, Rechnab, and Bari. We might include the Bist also; but the total drying of the old Beas has obliterated that distinction, as obtained in the Ayin Akbari in the 16th century.

Each Doab consists of two distinct portions, the cultivated strip of low land bordering the rivers (Kāchhi) and the central higher land (*Bār*). This word appears to be a corruption of the Arabic *barr*, which is defined by Col. Chesney, in his 'Euphrates,' to be a dry desert of hard clay, more or less covered with bushes and grass. The term was probably applied by the Arab conquerors, who have left traces of their language in the village dialect, in several Arabic words not usually in the Urdū.

The Bār may further be considered as twofold; that more properly so called is raised some thirty to fifty feet above the lower land.

The Bār proper, when seen at the close of a favourable rainy season, is very pleasing—a rich carpet of grass dotted over with bushes or large trees, mostly *Salvadora* or *Tamarix*. The soil is hard, and in a few places there are dunes of blown sand (as in the Thall), and occasionally tracts of sodiferous soil which produces nothing almost but *Salsolaceæ*.

The Bār improper is intersected by the remains of deserted water-courses (arid branches of the several rivers). It is either densely clothed with a jungle of *Jhund* (*Prosopis*) or *Tamarix* both *orientalis* and *Gallica*, or consists of almost perfectly bare open tracts of clay, sometimes sodiferous, causing friable soil, the dust of which will fall like water in drops, sometimes with sand-dunes, generally thinly clothed with the grey *Anabasis multiflora*, which toward the Chenab seldom exceeds two feet in height, while towards the Sutlej it often is five or six, making a small bush with ramifications not unlike a miniature oak, and not unpleasing to the eye when in fruit, when the winged calyces are often of a bright rose-colour.

In the lower part of the Bari Doab, forming the district of Multan, the Bār is intersected by innumerable long, low mounds, the remains of ancient canals from the Ravi, Chenab, and Beyas, which, gradually silting up, have raised themselves above the level of the country, and finally, probably owing to the change of the course of the latter river, been quite deserted. Towards the south of the district there are several ranges of low dunes of drifting sand which have a peculiar vegetation of their own.

The *Kāchhi*, or irrigated portion of the district, produces very fine crops of cereals, sugar-cane, and indigo, particularly on the Chenab. There are also extensive groves of the date-palm, which was introduced by the Arabs in the eighth century. The usual weeds of cultivation appear in the winter, not only those common to the Punjab and North-west Provinces, but from Persia and Afghanistan, that do not cross to the Sutlej, as *Hypecoum* and *Goldbachia*. It is well wooded, principally with *Acacia Arabica* and *Lebek* (the former of enormous size and height) and *Dalbergia Zizyphus*. Wherever irrigation penetrates, the produce is very great; without it, very little will grow. In some places there are only wells for the purpose; but throughout the *Kāchhi* they have the advantage of inundation-canals from the rivers, which fill their

water-courses about the beginning of May, just after the spring crop (Rabi) has been brought in. Consequently the cotton or millet is sown earlier than is the practice where they are dependent only on the rain-fall in June or July.

The climate is excessive, varying from 120° in the shade to 21° , the lowest that I have observed it. During winter, the temperature falls to the freezing-point every night that is clear. There are frequent showers during the season. Hail occasionally falls, principally in March or April. In May the hot winds commence. They blow from the south, instead of west or north-west as is the case in Hindostan. This wind continues more or less during the whole summer. The east wind is rare; but in some years heavy rain accompanies that wind, as in the North-west Provinces: on such occasions the "Bār" is clothed with verdure: but this cannot be depended upon, and for several years in succession there may be no rain-fall at that season; consequently the smaller semitropical annuals which abound in other parts of India are but rare, especially the *Acanthaceæ*.

Water-plants are extraordinarily rare, though there are so many stagnant and semi-stagnant branches of the rivers. I have observed but seven, two of them very rare (*Limnanthemum* and *Nymphæa*), while there is a total absence of the *Lentibulariæ*, *Alismaceæ*, *Naiades*, and *Charæ*, all of which abound in the region immediately to the north and west, so much so that the natives at Multan are unable to clarify their molasses, from the want of the "Jhanjh" or *Hydrilla*, and other *Naiades*, which are used for the purpose of "claying" in other parts of India.

The whole Phanerogamic flora is but 334, exclusive of 113 only cultivated.

There are 34 species riparious, including those which enjoy partial submergence.

There were 32 annual weeds of cultivation in the cold season (Rabi), 33 in the summer and autumn, including those which prevail at all seasons, being 9, 2, and 10 per cent. respectively.

Including all shrubs, trees, and woody climbers, I find but 43, being 13·3 per cent.

I find no less than 78 species peculiar to our deserts. Among these the following are collected by the poorer classes, especially the nomadic tribes who inhabit the "Bār." The women sweep up the fallen seeds by a whisk into straw baskets resembling our dust-pans. *Tribulus alatus*, *Zygophyllum simplex*, *Trianthema*,

Boerhaavia elegans, *Agrostis scabrifolia*, *Panicum colonum* and *Hydaspicum*, *Cenchrus*, and *Pennisetum*.

It is a curious sight to see the numbers that go out from the villages into the desert to collect and eat the fruit of the *Salvadora oleoides*, called *Pilū*, and the *Capparis (Sodada) decidua*.

The late Dr. Stocks kindly communicated to me a list of his Sindh flora: there are only 19 Mallic plants, or 94·3 per cent., not common to Sindh; there are 76, or 77·7 per cent., not observed in the cis-Sutlej States by myself in 1834–8. No less than 227, or nearly 65 per cent., are common to North Africa and Arabia; 83, or nearly 25 per cent., are European, while 73·3 per cent. are common to India proper, exclusive of the Punjab and Sindh. The most remarkable forms were *Pappophorus*, *Stipagrostis*, *Cressa*, *Frankenia*, *Limneum*, *Dipterygium*, and *Neuroda*.

Among the Cryptogamic flora we have but four, exclusive of fungi, *Marsilea*, an *Equisetum*, *Adiantum Capillus-Veneris*, and a *Phascum*. There are a few fungi found, and two of them are edible—one resembling a morel, called *Kumbha*, which is found in profusion in the Rechnab Desert, and which is much liked by the natives and those of my European friends who have had the opportunity of tasting it, which I myself have not. The other is subterraneous, found in cultivated land near Multan, and called *Boenphul*, or earth-fruit, which I do not at all like. Unfortunately my collection of fungi was lost; therefore I cannot enumerate the species.

Lastly, I may point out the paucity of species in this flora—only 338, exclusive of *Cellulares*, in an area exactly the half of Ireland (in which Dr. Mackay enumerates 1057 in his ‘Flora Hibernica’)—little more than what I collected in Banda, $\frac{1}{5}$ th of its area. These species are distributed in 67 orders, exactly five, on an average, in each order; and in 226 genera, giving an average of 1·5 to each genus,—very much less even than remarked upon by Dr. T. Anderson in his ‘Aden Florula.’ There are very few genera of more than three species. *Eragrostis* has ten; *Aristida*, 9; *Panicum*, 8; *Heliotropium*, 7; and *Corchorus*, 6.

I append descriptions of those species which have not been published, or which call for remark. There are some three or four which I cannot agree in uniting as Dr. Anderson did. My reasons I have given in detail in the notes.

In fine, I beg to offer my thanks for the valuable assistance afforded to me at Kew by our President, Dr. Hooker, Professor Oliver, and Mr. Black.

FLORULA MALLICA.

THALAMIFLORÆ.

RANUNCULACEÆ.

Ranunculus sceleratus, L. 776. Not very common.

MENISPERMACEÆ.

Cocculus villosus, DC. *Prodr.* i. 98. Common towards the north, rarer towards the south.

— *Leæba a*, DC. *P.* i. 99. *a*. A lofty climber: rare.

— — *β. tomentosa*. *β*. Prostrate on rocks at Shahkot, &c.

Anamirta Cocculus. *Cultivated*.

NYMPHÆACEÆ.

Nymphaea Lotus γ. pubescens, L. Rare.

NELUMBIACEÆ.

Nelumbium speciosum, DC. *P.* i. 311. *Cult.*

PAPAVERACEÆ.

Papaver album, L. 726. *Cult.*

Argemone Mexicana, L. 727. Gradually spreading from the north downwards. It had not reached Multan in 1854.

Hypecoum procumbens, L. 180 (*Chiazospermum pendulum*, Bernhardt).

The Punjab form has larger leaves than the European and Levant forms. The siliques are sickle-shaped and not pendulous.

Fumaria parviflora. Very abundant.

CRUCIFERÆ.

Farsetia Edgeworthii, H. f. & T. *Linn. Journ.* v. p. 147. Chandniot Hills.

— *Jacquemontii*, H. f. & T. *l. c.* p. 148. Most abundant. (Punjabi, *Farid muri*.) Pleasant biting taste: considered a specific for curing rheumatism.

— *Hamiltonii*, Royle. Principally towards the north-east.

Cochlearia flava (alyssoides). River-banks, towards north and east.

Malcolmia Africana, L. (*Arabis arvensis*, Edgew. *Linn. Trans.*). Only to the north.

Sisymbrium Irio, L. Fields.

— *irioides*, Boissier. Fields. Boissier describes *irioides* as larger than *Irio*, whereas this is rather smaller, and as having white petals, whilst those of this are dirty yellow.

— — *β. or nitidum?* A much more delicate plant. In the Rechnab Bar or desert, and on the rocks at Chandniot. I should rather refer it to *S. nitidum*.

Lepidium sativum, L. *Cult.*

Brassica Rapa, L. Extensively cultivated. The roots sliced and dried in the sun.

— *Stocksii*, H. f. & T. I have only rarely observed this accidentally in fields: not cultivated.

— *Eruca*, L. Much cultivated for its oil.

— (*Sinapis*) *campestris*, L. Cult. “*Sarson*.”

— *juncea*, L. Cult. “*Rai*.” These native names have been accidentally transposed in the paper in the Linn. Journ. v. pp. 169, 170.

Goldbachia lævigata, DC. Corn-fields, only towards the north-west.

Dipterygium glaucum, Dcn. Fl. *Sinaica*. Sand-hills to the south.

Raphanus sativus, L. Cult. The siliques boiled as a pot-herb—not the root.

RESEDACEÆ.

Oligomeris glaucescens, Dcn. *Jacqt.* t. 25 (*Reseda oligandra*, J. A. S. vii. p. 764).

CAPPARIDEÆ.

Capparis spinosa (*obovata*, Royle), *Jacqt.* t. 21. I find no description of the dehiscence of the fruit in any European Flora. It is noted by Decaisne in Jacquemont. When ripe the skin separates and curls up in three or four segments like a *Martagon*, showing the seeds immersed in crimson pulp. It is found abundantly at Multan, but not in the next region northward, and appears again in the confined valleys of the Sutluj, Beyas, &c., as far as the Indus at Iskardo. The fruit is pickled by the natives. I preserved the buds in the European style and found them first-rate.

— *decidua* (*Sodada*, Forsk.) (*aphylla*, Roxb.). Most abundant: much used for firing, as it burns with a gaseous flame. The largest individual I have observed was near Chichawatni, at Jhangbiabani, 8 feet in girth.

Cratæva Roxburghii. Gardens.

Cadaba Indica. Rocks at Chandniot.

Cleome papillosa (*C. gracilis*, Edgew. J. A. S.).

— *brachycarpa*, DC. (*C. Ruta*, Dcn. in Jacquemont, t. 19).

Polanisia viscosa. Fields.

Gynandropsis pentaphylla. Fields, and in the desert. Eaten as a vegetable. (*Gandhūli*, Ind.)

POLYGALACEÆ.

Polygala (*Blepharidium*) *erioptera*, DC.—See note, p. 199.

ELATINACEÆ.

Lancretia æstivosa, W. A. The flowers are as often twin as solitary. The carpels are very often destroyed by a small *Cerambyx*.

Bergia ammannioides.

CARYOPHYLLACEÆ.

- Vaccaria parviflora. Corn-fields.
 Silene conoidea. Ditto.
 Stellaria media. Ditto.
 Stipularia flaccida, *Roxb.* This differs not only in its decandrous flowers, but in the seed, which is broadly winged. In *pentandra* the seed is scrobiculate and scarcely winged, while in *fallax* the seed is a compressed sphere without any wing.
 Spargularia rubra. Fields.
 Polycarpæa corymbosa. Fields.

PORTULACACEÆ.

- Portulaca meridiana. Gardens and desert.
 — quadrifida. Ditto ditto.
 — oleracea. Cultivated as a vegetable.

MOLLUGINEÆ.

- Mollugo Cerviana. Fields and desert.
 — nudicaulis. Ditto ditto.
 Orygia trianthemoides. Chandniot, &c.
 Glinus lotoides. Desert.

FRANKENIACEÆ.

- Frankenia pulverulenta. In sodiferous soil, but rare.

MALVACEÆ.

- Abutilon Indicum. (Ind. *Abut kanda.*) Used in coughs.
 Sida cordifolia.
 — grewioides, *Guil. & Per. Fl. Seneg.* 71. This differs from the African form in the petioles being longer, and the pedicels $\frac{1}{2}$ to 1 inch long, not *sessile* as described. The carpels are rugose on the back and shortly beaked.
 — humilis.
 Malva vulgaris.
 — parviflora.
 Althæa Ludwigii.
 Hibiscus micranthus, *Linn.* Chandniot hills.
 — laguneoides. In cotton-fields.—See description, p. 199.
 Abelmoschus esculentus.
 Gossypium herbaceum. *Cult.*

TILIACEÆ.

- Corchorus depressus (*Antichorus*), *L.*
 — trilocularis.
 — olitorius.
 — capsularis.

Corchorus fascicularis.

Grewia Asiatica. Gardens.

— *populifolia?* Bār. (*Gangher*, Ind.)

Triumfetta rotundifolia.

MELIACEÆ.

Melia composita. *Cult.*

Azadirachta Indica. *Cult.*

SAPINDACEÆ.

Cardiospermum Halicacabum.

AMPELIDEÆ.

Cissus carnosa.

Vitis vinifera. *Cult.*

GERANIACEÆ.

Monsonia Mallica. Perhaps a var. of *Erodium niveum*, Decaisne.—See description, p. 200.

OXALIDEÆ.

Oxalis corniculata.

ZYGOPHYLLACEÆ.

Zygophyllum simplex. Seeds eaten in the desert. Called "*Alethi*," as well as *Trianthema*.

Tribulus alatus. Seeds eaten in the desert. Called "*Bhūkri*."

— *lanuginosus*.

Fagonia Cretica, Linn. (*Arabica*, *Mysorensis*, &c.). Very variable, with simple and ternate leaves.

RUTACEÆ.

Peganum Harmala. Desert.

CALYCIFLORÆ.

RHAMNACEÆ.

Zizyphus nummularia. Not very plentiful.

— *Jujuba β. hortensis*. The wild species does not reach this region, as far as I have observed.

— — *γ. Hysudricus*.—See note, with description, pp. 200–202.

— *Spina-Christi*.

— *vulgaris*. In gardens: rare.

ANACARDIACEÆ.

Mangifera Indica. *Cult.*: peculiarly delicious in Multan.

MORINGACEÆ.

Hyperanthera pterygosperma. *Cult.*

LEGUMINOSÆ.

- Edwardsia Hydaspica. Gardens at Multan, from the Salt range.
 Crotalaria Burhia. Desert.
 Lotus corniculatus. Damp sand by the rivers.
 Trigonella Fœnum-græcum. *Cult.*
 — incisa.
 Melilotus leucantha.
 — parviflora.
 Medicago lupulina.
 Cyamopsis psoraleoides. *Cult.*
 Psoralea plicata. (*Bakhtmal*, Ind.) Camels delight in it.
 Indigofera linifolia.
 — cordifolia.
 — enneaphylla.
 — ornithopodioides, *Schimp.* This seems to me different from *Senegalensis*.
 — tinctoria. *Cult.*
 — paucifolia. The Indian form is more torulose than the African.
 Macronyx stricta, *Dalz.* (*Tephrosia tenuis*, Wall. Cat.).
 Tephrosia purpurea. Rare, though so abundant in the Cis-Sutluj.
 Clitoria Ternatea. *Cult.*
 Sesbania Ægyptiaca. *Cult.*
 — aculeata. Fields.
 Astragalus contortuplicatus.
 — tribuloides.
 — prolixus.
 Alhagi Maurorum.
 Æschynomene Indica.
 Cicer arietinum. *Cult.*
 Ervum Lens. *Cult.*
 — hirsutum. Fields.
 Vicia sativa (*angustifolia*, DC.). Fields.
 Pisum sativum. *Cult.*
 Lathyrus sativus. *Cult.*
 — Aphaca.
 — sphæricus, *Retz.* (*angulata*). Fields.
 Abrus precatorius. Jungle.
 Rhynchosia medicaginea. Jungle.
 — sericea. Jungle.
 Phaseolus Mungo (*Roxburghii*, W. & P.). *Cult.*
 — aconitifolius. *Cult.*
 Dolichos Lablab. *Cult.*
 Canavalia gladiata. *Cult.*
 Dalbergia Sisoo. Wild and *cult.*
 Butea frondosa. Rare, and only towards the north.
 Erythrina Indica. *Cult.*
 Prosopis spicigera. Most abundant.

Acacia Farnesiana. *Cult.*

— Jacquemontii.

— Arabica. Both the common and the cupressiform : sometimes both varieties on the same tree. It grows to a much larger size than in the N.W.P. I have measured one 16 feet 4 inches in girth, and several 11 or 12 feet.

— modesta. Only towards the north.

Albizia Lebec. *Cult.* : never, apparently, wild.

Cathartocarpus Fistula. *Cult.*

Cassia suffruticosa. *Cult.*

— Tora.

— Sophera. Rare.

Bauhinia variegata. *Cult.*

Tamarindus Indica. *Cult.* : very rare.

ROSACEÆ.

Potentilla supina.

Rosa Indica. *Cult.*

— Damascena. *Cult.*

Neuroda procumbens. Sand-hills.

Amygdalus Persica. *Cult.*

— vulgaris. *Cult.*

Pyrus Malus. *Cult.*

Cydonia. *Cult.*

GRANATEÆ.

Punica Granatum. *Cult.*

SALICARIEÆ.

Lawsonia alba. *Cult.* both in gardens and at a few places (*e.g.* Mailsian) in fields for the dye.

Ammannia vesicatoria.

— multiflora.

Ameletia rotundifolia.

Rotala Roxburghii.

TAMARISCINEÆ.

Tamarix dioica. Called "*Lai.*"

— Gallica. Called "*Pilchi.*" Occasionally producing manna.

— orientalis (*Faras*, Royle). Called "*Pharma.*" Generally covered with salt, so much that poor people dip it in water to season their bread. The wood when burnt is most offensive and stercoraceous. It grows with great rapidity. I have measured trees of six or seven years' growth 5 feet in girth, and they fall down of old age at twenty years.

CUCURBITACEÆ.

Cucumis trigonus. Desert.

— pubescens. Wild.

— — Melo. Many varieties of the Musk Melon, of great excellence.

- Cucumis usitatissimus*. “*Kakri*.”
 — *cicatrissatus*, *Stocks*. “*Albinda*.”
 — *Momordica*. “*Pūnt*.”
Citrullus vulgaris. *Cult*.
 — *fistulosus* (*St.*). *Cult*. H. J. B. iii. p. 74.—See description, p. 202.
 — *Colocynthus*.
Luffa pentandra. *Cult*.
 — *acutangula*. *Cult*.
Lagenaria vulgaris. *Cult*.
Momordica Charantia. *Cult.*, and wild in sand-hills.
Mukia scabrella.

I have not observed any species of *Trichosanthes* or *Coccinia*, which are common in Sirhind and Lahore.

AIZOONEÆ.

- Trianthema pentandra*, *Linn.* “*Itsit*.”—See description, p. 202.
 — *crystallina*, *Forsk.* “*Alethi*.” The seeds are swept up on the bare hard soil on which it grows and eaten in times of scarcity. It covers miles of the desert, particularly in the Rechnab Bār.—See description, p. 203.
 — *Hydraspica*.—See description, p. 203.

UMBELLIFERÆ.

- Anethum Sowa*.
Petroselinum sativum.
Ptychotis Ajwain.
Coriandrum sativum. Wild, among pulse fields.

RUBIACEÆ.

- Hedyotis Burmanniana*.
Wendlandia cinerea. Two stray specimens carried down by the Jhilum and Chenab, and growing wild.

COMPOSITÆ.

- Vernonia cinerea*.
Berthelotia lanceolata.
Grangea Ægyptiaca.
Blumea, sp. ——.
Eclipta prostrata.
Franceœuria crispa.
Xanthium Strumarium.
Myriogyne minuta.
Trichogyne cauliflora.
Echinops echinatus.
Microlonchus divaricatus.
Cirsium arvense.
Carthamus Oxyacanthus. Not so common as in Sirhind.
 — *tinctorius*. *Cult*.

Microrhynchus sarmentosus.

— *nudicaulis*.

Sonchus oleraceus. Rare (sand-hills).

— *Candollianus* (*Zollikoferia*, DC.). The pappus is remarkable, and very different from that of the normal *Sonchi*.

Cichorium Intybus. *Cult.*

Lactuca sativa. *Cult.* for the seeds, which are used as a medicine.

COROLLIFLORÆ.

PRIMULACEÆ.

Anagallis cærulea.

SAPOTACEÆ.

Mimusops Elengi. *Cult.* A tree in the Huzūri Bagh, Multan; said to have been brought by the late Nawab of Multan from Mecca.

— *Kauki*. *Cult.*

APOCYNÆ.

Nerium odorum. *Cult.*

ASCLEPIADACEÆ.

Leptadcnia Jacquemontii.—See note, p. 204.

Dæmia extensa.

Calotropis procera (*Hamiltonii*). In Bari Bār grows quite arboreous, 1½ feet in girth.

Pentatropis spiralis. The Punjab and Sindh plant is this species—not *microphylla*.—See note, p. 204.

Periploca aphylla.

Oxystelma esculentum.

Ceropegia esculenta. Both the tubers and leaves eaten as a vegetable. (*Gahlōt*, Ind.)—See description, p. 204.

Boucerosia edulis. Eaten as a vegetable. (*Situn*, Ind.)—See description, p. 205.

GENTIANACEÆ.

Limnanthemum Kleinianum.

Slevogtia orientalis.

BIGNONIACEÆ.

Tecoma undulata (*Jacq.*). Rare, but found both in Rechnab and Bari deserts. (*Lahúra*, Ind.)

CONVOLVULACEÆ.

Cressa Cretica.

Convolvulus arvensis. Fields: remarkably large and sweet-scented.

— *pluricaulis*. Desert.

Batatas pentaphylla. Rechnab Bār.

Ipomæa Pes-Tigridis.

— *sessiliflora*. With a variety.

— *reptans*. Not common.

Pharbitis Nil.

Rivea hypocrateriformis.

Cuscuta reflexa.

— *planiflora*. Found in a field of Cashmir lucerne at Gogaira.

CORDIACEÆ.

Cordia Myxa. *Cult.*

— *subopposita*. *Cult.*

BORAGINEÆ.

Ehretia serrata. In the Bār.

Heliotropium supinum.

— *Europæum*.

— *bicolor*.—See note, p. 205.

— *ramosissimum*.

— *marifolium*.

— *strigosum*.

— *brevifolium*.

Tournefortia subulata (*Edgeworthii*, DC.).

Arnebia hispidissima.

Nonnea Edgeworthii.

Trichodesma Africanum.

— *Indicum*.

Achusa hispida.

SOLANACEÆ.

Lycium Europæum (*Edgeworthii*, DC.).

Withania somnifera.

— *coagulans* (*Puneeria*, Stocks). (Ind. *Akri*: the fruit *Panni* or *Panir*.)

Solanum xanthocarpum.

— *gracilipes*. Rechnab Bār.

— *nigrum*.

— *Melongena*. *Cult.*

Datura fastuosa. *Cult.*

Capsicum ——. *Cult.*

SPHENOCLEACEÆ.

Pongatium Zeylanicum.

SCROPHULARINEÆ.

Doratanthera linearis. Desert.

Antirrhinum Orontium. Fields.

Linaria ramosissima. Chandniot.

Celsia Coromandeliana. Edges of rivers.

Herpestes Monieri. Ditto.

Mazus rugosus. Ditto.

Lindenbergia urticifolia.

— *macrostachya*. Chandniot.

Veronica Buxbaumii. Fields and gardens.

— *Anagallis*. Edges of rivers.

Striga euphrasioides.

OROBANCHEÆ.

Phelipæa Calotropidis. On the roots of *Calotropis* only. Differs from *lutea* in the anthers, which are mucronate, while in this they are obtuse.

LABIATÆ.

Ocimum Basilicum. *Cult.*
 — sanctum. *Cult.*
 Mentha incana? *Cult.*
 Salvia pumila. Edges of rivers.
 — plebeia. Ditto.
 Leucas urticifolia. Rechnab Bār.
 Dracophyllum Royleanum. *Cult.*

VERBENACEÆ.

Verbena officinalis.
 Lippia nodiflora.
 Clerodendron phlomioides.
 Vitex bicolor.

ACANTHACEÆ.

Dipteracanthus patulus. Chandniot and Shahkot rocks.
 Barleria ciliata. Ditto.
 Acanthodium spicatum. Desert.
 Peristrophe bicalyculata. Only once found.

PLUMBAGINEÆ.

Plumbago Zeylanica.

SALVADORACEÆ.

Salvadora oleoides. Most abundant: the fruit much eaten in the desert. 12 feet in girth at Thannam; at Baluana 11 feet 4 inches. (Ind. *Van*: the fruit is *Pīlū*.)
 — Indica. Rare: leaves eaten as a salad. At Pakpatan 14 feet 9 inches in girth.

PLANTAGINEÆ.

Plantago amplexicaulis.
 — Ispagula. *Cult.*

MONOCHLAMYDEÆ.

PHYTOLACCACEÆ.

Limeum Indicum, *Stocks*, in *Anderson, Fl. Adenensis, Linn. Journ.* v.—
 See description, p. 206.

Giesekia pharnaceoides.
 — rubella.

SALSOLACEÆ.

Beta vulgaris. *Cult.*
 Chenopodium murale.
 Spinacia oleracea. *Cult.* Not introduced by Europeans, but by the Arabs.
 Kochia arenaria. Very abundant.
 Sueda Indica (*Salsola lana*, Edgew.). (*Lani*, Ind.)

- Anabasis multiflora*. (*Lana*, Ind.) Grows in the Bari Bār to 7 or 8 feet high, like a dwarf tree.
Caroxylon foetidum. (*Gora lana*, Ind.)
Salsola Griffithsii. (*Khar*, Ind.) Used for preparing *Sajji*, potash.

AMARANTHACEÆ.

- Celosia argentea*.
Amaranthus Mangostanus. *Cult.*
 — *Gangeticus*. *Cult.*
 — *angustifolius*.
 — *Blitum*.
Mengea tenuifolia.
Euxolus caudatus.
Achyranthes aspera.
Digera arvensis.
Alternanthera denticulata.
Pupalia lappacea.
Ærua Javanica.
 — *Bovii*.—See description, p. 206.
 — *brachiata*.
 — *scandens*.

NYCTAGINEÆ.

- Boerhaavia elegans*. (*Helra*, Ind.) Much eaten in the desert. The seeds mucilaginous.
 — *diffusa*.
 — *repens*.
 — *vulvariifolia*.

POLYGONACEÆ.

- Polygonum glabrum*.
 — *Dryandri*.
Rumex dentatus (*Wallichianus*).
Calligonum polygonioides.

EUPHORBIACEÆ.

- Phyllanthus Niruri*.
Emblica officinalis. *Cult.*
Crozophora oblongifolia.
 — *plicata*.
Euphorbia Helioscopia.
 — *Chamæsyce*.
 — *granulata*, *Forsk.*
Ricinus communis. *Cult.*

URTICACEÆ.

- Cannabis sativa*. *Forskålea* probably exists in the rocks at Chandniot, but I did not see it.
Ficus Indica.
 — *religiosa*.
 — *caricoides*.

Morus Indica.

— Tatarica. *Cult.*

SALICINEÆ.

Populus Euphratica.

Salix Babylonica. *Cult.*

— tetrasperma. *Cult.*

GNETACEÆ.

Ephedra alata.

ENDOGENES.

ORCHIDEÆ.

Zeuxine sulcata.

PALMÆ.

Phoenix dactylifera. Introduced by the Arabs in the seventh century ; now forming vast self-sown groves.

ASPHODELEÆ.

Asphodelus fistulosus.

Asparagus, sp. Rechnab and Chaj Bārs.

Allium Cepa. *Cult.*

Uropetalum probably exists, though I never met with it.

AMARYLLIDEÆ.

Narcissus poeticus. Gardens.

Crinum, sp. Gardens.

TYPHACEÆ.

Typha latifolia.

CYPERACEÆ.

Cyperus rotundus, *Linn.*

— procerulus.

— Irio.

— pygmæus. *Stylo trifido*, as also in the Egyptian and Australian forms.

Scirpus grossus.

— affinis (*Nees*).

Fimbristylis communis, *Knth.*

Eleocharis palustris.

GRAMINACEÆ.

ORYZEÆ.

Oryza sativa. *Cult.*

OLYREÆ.

Zea Mays. *Cult.*

PANICEÆ.

Paspalum serobiculatum. *Cult.*, but not common.

Panicum brizoides.

— colonum.

— coccospermum (*vestitum*, *Nees*).

— psilopodium.

Panicum antidotale.

— *miliare*. *Cult.*

— *Hydaspicum*. Desert.—See description, p. 207.

— *miliaceum*. *Much cultivated.*

Digitaria ciliaris.

— *sanguinolenta*.

Oplismenus prostratus (*Pan. setigerum*, Roxb.).

— *Crus-Galli* (*Pan. hispidulum*, Roxb.).

Setaria Italica. *Cult.*

— *glauca*.

— *verticillata*.

Pennisetum Cenchri.

Cenchrus echinatus.

— *montanus*, *Nees*. Varies with green or purple spikes.

Penicillaria spicata. *Cult.*

Lappago racemosa.

PHALARIDÆ.

Phalaris minor.

ANDROPOGONÆ.

Imperata cylindrica (*Kœnigii*).

Erianthus Ravennæ.

Saccharum Sara.

— *canaliculatum*.

— *spontaneum*.

— *officinarum*. *Cult.*

Andropogon Bladhii.

— *annulatus*.

— *pertusus*.

— (*Cymbopogon*) *Arriani*.—See description, p. 208.

Vetiveria muricata. Abundant in the north, but ceases about 80 miles north of Multan.

Sorghum vulgare. *Cult.*

— *Halepense*. Rare.

Apluda communis, *Nees* (*aristata*, Roxb.).

Elionurus hirsutus.

STIPACÆ.

Aristida (*Chætaria*) *a. vulgaris*.

— — *β. var. cærulescens*.

— *hystricula*, n. sp.—See description, p. 208.

— (*Arthratherum*) *Royleana*.

— *funiculata*.

— *Mallica*, n. sp.—See description, p. 209.

— *articulata*, n. sp.—See description, p. 209.

— (*Stipagrostis*) *plumosa*, *Linn. nec T. Anderson*.—See description, p. 209.

— *pogonoptilum*, *Jaub. & Spach*, no. 129?; no. 638 of *Stocks's Herb.*

— *hirtigluma*.

AGROSTIDEÆ.

Polypogon Monspeliensis.

Vilfa scabrifolia, *Hochst.* no. 2302; no. 667 of *Stocks*.

—— commutata.

—— pallida.

PAPPOPHOREÆ.

Pappophorum Arabicum?

—— nanum (*Vincentianum*, Schmidt).

—— Persicum? An *Aucheri*? but much taller.

CHLORIDEÆ.

Eleusine Corocana. *Cult.*

—— flagellifera (*Arabica*).

Dactyloctenium Ægyptiacum.

—— var.? mucronatum. No. 54689, *Aucher*.

Cynodon linearis.

Dinebra verticillata.

Chloris villosa. *Shahkot*.

Schœnfieldia pallida. *Rare*.

ARUNDINEÆ.

Arundo Donax.

Phragmites Roxburghii.

HORDEEÆ.

Hordeum 6-stachyum. *Cult.*

Triticum æstivum. *Cult.*

—— hybernum. *Cult.*

—— durum. *Cult.*

Lolium temulentum.

AVENEÆ.

Avena fatua.

POEÆ.

Æluropus repens (*Nilotica*).

Poa annua.

Eragrostis poæoides.

—— unioloides.

—— Brownii.

—— tremula.

—— plumosa.

—— interrupta, *Roxb.*

—— viscosa, *Roxb.*

—— nutans.

—— diandra, *Roxb.*

—— cynosuroides. "*Panni*."

BAMBUSEÆ.

Bambusa. *Cultivated* at Baghdad, 40 miles above Multan.

MARSILEACEÆ.

Marsilea quadrifolia.

EQUISETACEÆ.

Equisetum.

FILICES.

Adiantum Capillus-Veneris. In old wells.

MUSCI.

Phascum, sp.

	Cult.	Spont.	Cis Sutlej.	Sindh.	India.	Arabia & Africa.	Europe.
THALAMIFLORÆ.							
Ranunculaceæ .. .. .	..	1	1	1	1	1	1
Menispermaceæ	1	2	1	2	1	1	..
Nymphæaceæ .. .. .	..	1	1	1	1	1	..
Nelumbiaceæ	1	..	..	..	..	..	..
Papaveraceæ	1	3	2	3	1	2	2
Cruciferae	6	11	4	9	4	9	3
Resedaceæ .. .. .	..	1	1	1	1	1	..
Capparidæ	1	7	4	7	5	7	1
Polygalaceæ .. .. .	..	1	..	1	..	1	..
Elatinaceæ .. .. .	..	2	1	2	2	1	..
Caryophyllaceæ .. .. .	..	6	5	6	6	5	5
Portulacaceæ .. .. .	..	3	3	3	2	2	1
Molluginæ .. .. .	..	4	3	4	4	4	1
Frankeniaceæ .. .. .	..	1	..	1	..	1	1
Tamariscinæ .. .. .	..	3	2	3	1	2	1
Malvaceæ	2	9	6	9	8	8	3
Tiliaceæ	1	7	5	7	7	7	..
Meliaceæ	2	..	..	..	..	..	..
Sapindaceæ .. .. .	..	1	1	1	1	..	..
Geraniaceæ .. .. .	..	1	..	..	..	1	..
Oxalidæ .. .. .	..	1	1	1	1	1	1
Zygophyllaceæ .. .. .	..	4	2	4	3	4	2
Rutaceæ .. .. .	..	1	1	1	..	1	1
Ampelidæ	1	1	1	1	1	1	..
Total ..	16	71	45	68	50	61	23
CALYCIFLORÆ.							
Rhamnaceæ	2	2	2	2	2	1	1
Anacardiaceæ	1	..	..	..	..	..	..
Moringaceæ	1	..	..	..	..	..	..
Leguminosæ	23	34	28	32	25	23	10
Rosaceæ	7	2	1	2	1	2	1
Granateæ	1	..	..	..	..	..	..
Salicariæ	1	4	4	4	4	1	..
Cucurbitaceæ	14	5	4	5	4	3	..
Aizooneæ .. .. .	..	3	2	3	2	2	1
Umbelliferæ	2	..	..	..	..	..	..
Rubiaceæ .. .. .	..	2	2	..	2	..	..
Synanthereæ	3	17	17	15	11	15	5
Total ..	55	69	60	63	51	47	18

	Cult.	Spont.	Cis Sutlej.	Sindh.	India.	Arabia & Africa.	Europe.
COROLLIFLORÆ.							
Primulaceæ .. .. .	..	1	..	1	1	..	1
Sapotaceæ	2	..	..	..	..	..	..
Apocynæ	1	..	..	..	..	..	..
Asclepiadaceæ .. .. .	..	8	4	8	4	4	..
Gentianaceæ .. .. .	..	2	2	1	2	1	..
Bignoniaceæ .. .. .	..	1	1	..	1	..	..
Convolvulaceæ .. .. .	..	11	9	11	9	5	2
Cordiaceæ	2	..	..	..	..	..	..
Boraginæ .. .. .	..	12	10	12	7	7	3
Solanaceæ	3	6	4	6	5	3	3
Sphenocleaceæ .. .. .	..	1	1	1	1	1	..
Scrophularinæ .. .. .	..	11	10	11	10	4	3
Orobanchæ .. .. .	..	1	1	1	..	..	..
Labiata	4	3	2	3	3	2	..
Verbenaceæ .. .. .	..	4	4	4	3	2	..
Acanthaceæ .. .. .	..	4	3	4	3	3	..
Plumbaginæ .. .. .	..	1	1	1	1	1	..
Salvadoraceæ .. .. .	..	2	2	2	1	..	..
Plantaginæ	1	1	1	1	..	1	1
Total ..	13	69	55	67	51	34	13
MONOCHLAMYDEÆ.							
Phytolaccaceæ .. .. .	..	3	2	3	2	3	..
Salsolaceæ	2	6	4	6	2	4	2
Amaranthaceæ	2	13	10	13	13	11	2
Nyctaginæ .. .. .	..	4	2	4	3	4	..
Polygonaceæ .. .. .	..	4	3	4	3	4	2
Euphorbiaceæ	2	6	4	6	4	6	2
Urticaceæ	1	5	5	5	5	2	1
Salicinæ	2	1	..	1	..	1	..
Gnetaceæ .. .. .	..	1	1	1	1	1	..
Total ..	9	43	31	43	33	36	9
ENDOGENES.							
Commelinaceæ .. .. .	..	1	1	1	1	..	..
Orchideæ .. .. .	..	1	1	1	1	..	..
Palmæ	1	..	..	..	..	..	..
Asphodeleæ	1	2	2	2	1	1	1
Amaryllideæ	2	..	..	..	..	..	..
Typhaceæ .. .. .	..	1	1	1	1	1	1
Cyperaceæ .. .. .	..	8	7	8	8	5	2
Graminaceæ :—							
Olyreæ	1	..	..	..	..	..	..
Paniceæ	6	16	14	15	14	10	5
Phalarideæ .. .. .	..	1	1	1	1	1	1
Andropogoneæ	2	13	11	13	11	7	2
Stipaceæ .. .. .	..	9	7	5	3	5	..
Agrostideæ .. .. .	..	4	3	4	3	2	1
Pappophoreæ .. .. .	..	3	..	1	..	3	..
Chlorideæ	1	7	5	6	5	5	2
Arundineæ .. .. .	..	2	2	2	2	1	1
Hordeæ	4	1	1	1	..	1	..
Aveneæ .. .. .	..	1	1	1	1	1	1
Poeæ .. .. .	..	12	10	12	8	6	3
Bambuseæ	1	..	..	..	..	..	..
Oryzeæ	1	..	..	..	..	..	..
Total ..	20	82	67	74	60	49	20

	Orders.	Genera.	Cult.	Spont.	Cis-Sutluj.	Sindh.	India.	Arabia & Africa.	Europe.
Thalamifloræ	22	50	16	71	45	68	50	61	23
Calycifloræ	8	52	55	69	60	63	51	47	18
Corollifloræ	16	52	13	69	55	67	51	34	13
Monochlamydeæ	9	27	9	43	31	43	33	36	9
Exogens	55	181	93	252	191	241	185	178	63
Endogens	8	41	20	82	67	74	60	49	20
Phanerogams	63	222	113	334	258	315	245	227	83
Acrogens, exclusive of } Fungi }	4	4	..	4	4	4	4	4	4
Grand total..	67	226	113	338	262	319	249	231	87

Notes on some of the Plants in the foregoing list.

POLYGALA.

There seems to be very much confusion about these *Blepharidia*. Dr. T. Anderson, in his 'Florula Adenensis,' unites a vast number of the forms published in DC. Prod. and Wight and Arnott, Prod., under the name *triflora* of Linnæus. I have examined the original specimens in the Herrmann herbarium in the British Museum, no. 269, published by Linnæus in the 'Flora Zeylanica,' vol. ii. p. 10; I have carefully compared them with the numerous specimens in the Kew herbarium, and have satisfied myself that there are three or four distinct species. *Triflora* is *rosmarinifolia* exactly. The *triflora* of Wight and Arnott has not such pointed leaves and alæ; the capsules are not at all margined, and usually pubescent, not glabrous. Both of these forms, as well as the third, *serpyllifolia*, to which I would refer the Aden species, though it differs somewhat from the Indian form, are prostrate. The last form is that described by DC. under the name *erioptera*, which does not suit this particular form, as the alæ are almost glabrous—only delicately ciliolate; it may probably be the "*obtusata*" of DC. The pubescent form obtains principally to the West of Africa, while those from Egypt and Abyssinia are almost identical with the Multan type.

HIBISCUS LAGUNEOIDES. Bipedalis, ramosus, omnino pilis stellatis pubescens, foliis late ovatis plus minus trilobatis repandis, stipulis minutis subulatis, floribus axillaribus solitariis, pedicellis (ramulisque junioribus) glanduloso-pilosis; involucello 9-fido; calyce 5-fido ner-

voso nec inflato, hirtello, pubescentia bifirmi; corolla parvula, petalis oblique truncatis calyce vix longioribus albis demum rubentibus; staminibus monadelphis biseriatis; antheris innumeris; stigmatibus 5; capsula ovata pubescente, pilis stellatis setisque brevibus rigidis, 5-loculari, loculis 12-spermis, seminibus nigris glabriusculis.

Both in the tamarisk jungle and in cotton-fields.

MONSONIA MALLICA. Foliis cordatis sericeis obtusis, scapis hirsutis, bracteis barbatis, sepalis mucronatis.

Multan; Sindh.

Annua, radice fibrosa, caule subnullo, foliis paulatim approximatis cordatis obtusis utrinque sericeis, nec niveis nec hirsutis nec nervosis, stipulis cuneatis ciliatis; scapis prælongis vix erectis, pilis longis patentibus albis hirsutis; umbellis multifloris, bracteis subulatis apice pilis longis barbatis, pedicellis elongatis pubescentibus; sepalis obovatis sericeo-pubescentibus marginatis longe mucronatis; petalis istis æqualibus integris; staminibus 15 in phalangibus 5 monadelphis; stylis sericeis; achenio basi acuto apice truncato rugoso pubescente, rostro prælongo plumoso, $2\frac{1}{2}$ –3 poll. longo.

This differs from *M. nivea* in the pubescence and texture of the leaves and the mucro of the sepals, and from *M. hispida* in the size and pubescence. Cf. Boissier, i. 8. p. 122.

I have very great hesitation about the species of *Zizyphus* cultivated in India or found in the Punjab.

The *Z. vulgaris* is cultivated in Cashmir, and, rarely, in gardens in the Punjab: I have not observed it in Multan. *Z. Jujuba* is abundant wild in the northern part of the Punjab, but not in Multan, where *nummularia* is only found sparingly, compared to the profusion seen in the northern districts. Although in the usual form no one could hesitate about the species, I have seen small stunted specimens of *Jujuba* that it would be difficult to distinguish from *nummularia* with thorns shorter than usual.

Z. Spina-Christi is found in gardens, but sparingly, and with some difference from the typical and Syrian form. The bark, though paler than the common Punjab *Ber*, is not the clear grey so remarkable in all the Syrian and African specimens and descriptions; and the inflorescence is almost glabrous and with almost sessile cymes, not downy and dichotomous. The petals in all that I have examined are emarginate, whereas they are entire in *Jujuba*. The name *Nabeca* was given by Forskahl to this species, after the Arabic name *Nabc*; but, unfortunately, the name *Napeca* was applied by Linnæus to some specimens collected in Ceylon by Herrmann, now in the British Museum. I have compared the

original specimens with those under the same name in the Linnean herbarium, and I find them to be a form much resembling *Enoplia*, but differing in having more glabrous leaves, longer peduncles to the cymes, and double thorns. I see specimens in the Kew herbarium almost exactly similar, from the Concan and Ceylon, from Mr. J. Walker; and it will be interesting if botanists on the spot, in Ceylon and the Concan, will ascertain if it be a different species or only a variety.

There now remains to me to define the form most abundant in the Punjab. I am not sure that it is anywhere truly wild, though I have observed it in the desert, but probably dropped by man or bird.

This species is immediately noticed on entering the western part of the Cis-Sutluj States, where it first appears as a small tree (the branches not drooping as the typical wild or cultivated *Jujuba*), and with almost smooth leaves. There is a slight pubescence in young specimens, but they are almost glabrous when old. The fruit is globular and dark-coloured, not orange or red like the wild Ber, or green like the cultivated. The leaves are usually roundish ovate, more or less serrulate. The inflorescence varies from perfect smoothness to thick tomentum. The cymes are usually short, sometimes reduced to a fascicle of flowers as in *Lotus*.

At first I had referred this to *Lotus*, but on comparison I find it is quite distinct; and there are no specimens in the herbaria leading from one form to the other; while it is difficult to consider this form to be only a variety of *Jujuba* as it has hitherto been defined.

Wight and Arnott define it by the tawny colour of the under surface of the leaf; but in the cultivated specimens, as well as in other northern wild specimens, the pubescence is almost grey, while we see a similar difference in the colour of the tomentum in *Enoplia* and *nummularia*. Therefore I believe it is more correct to consider it a well-marked variety of *Z. Jujuba*.

ZIZYPHUS JUJUBA. Arbor, foliis ovatis serrulatis v. integris, spinis geminis, una longiore rectiuscula, altera uncinata, cymis brevibus, petalis unguiculatis concavis integris demum reflexis.

a. *spontaneus*. Foliis subtus ferrugineo-tomentosis, drupis sphaericis flavo-aurantiacis.

β. *hortensis*. Foliis late ovalibus 3-nerviis basi inæqualibus integerrimis nervis apice breviter mucronatis, sursum glabris, subtus cano-tomentosis, cymis sessilibus; pedicellis pedunculo longioribus vix petiolum æquantibus, multifloris, alabastris depressis tomentosis sublanatis; drupis ovatis viridibus vel flavescentibus.

Hortis passim.

γ. *Hysudricus*. Foliis ovalibus obtusissimis basi paulo inæqualibus, junioribus pubescentibus demum utrinque glabratis serrulatis, cymis petiolo sublongioribus, pedicellis vel *glabris* vel lanatis integris; drupa globosa viridi-purpuraseente.

Punjab, passim.

CITRULLUS FISTULOSUS, *Stocks in H. J. B.* vol. iii. p. 74. Hirsutus, foliis cordatis sinuato-lobatis v. pinnatifidis, flore hirsuto, stam. non nectariferis, pepone globoso hirsuto.

Sindh; Multan.

Hirsutissimus, caulis demum fistulosus. Folia cordata, sinuato-lobata pinnatifidaque laciniis obtusis rotundatis; juniora molliter, seniora scabre hirsuta, glandulosa, moschata, pallide virescentia. Cirrhi 2-4-fidi; bracteæ cucullatæ, glabriuseulæ, 1-3-floræ. Flores pedunculati; ♂ pedunculis foemineis triplo longioribus. Calyx complanatus, tubo subnullo, breviter 5-dentatus, dentibus subulatis. Corolla subrotata v. cyathiformis, extus hirsutissima, intus pallide flava glabra venosa 5-7-partita. Stamina 5, basi quasi articulata, nec fornicata nec ciliata, 2-3-4-adelpha, connectivo 3-4-lobato. Anthera sinuata; discus centralis depressus, subtrigonus. ♀ Calycis tubus contractus, brevissimus, limbo plano breviter 5-dentato. Corolla extus hirsutissime, intus glabre 5-partita (profundius quam in masculo), segmentis ovatis acutis. Stamina rudimentaria, 2-3, quorum 2 bidentata, glabra, nec basi nectarifera. Discus glandulosus, annularis, pulvinatus. Stylus brevis, crassus, 3-fidus, stigmatibus convoluto-infundibuliformibus. Ovarium 3-loeculum, globosum, hirsutum. Pepo globosus, seminibus marginatis obtusis.

This species is found in Sindh and Multan, and much cultivated under the names of *Tinda*, *Albinda*, and *Dil-pasand*, "beloved to the heart": eaten cooked as a gourd. It seems a very different species from the water-melon, to which it is nearest. The stamens of the latter are nectariferous both in the male and female flower, as well as in *Colocynthis*; the anthers are only sinuate, not gyrose or conduplicate or anfractuose. M. Nandin refers this to *C. vulgaris*, but without any note as to whether he has made any experiments to prove the unity of the species.

TRIANTHEMA PENTANDRA, *Linn.* Foliis oblique ovatis v. oblongis inæqualibus; floribus axillaribus, uno sessili cæteris brevi-pedunculatis 3-7-nis pentandris; fructu duro tetraspermo circumscisso, opereulo clauso bipartibili loeculo mitriformi.

North-west Provinces.

Annua, diffusa vel suberecta, ramis teretibus glandulosis. Folia opposita, inæqualia, oblique ovalia vel oblonga, subtus glauca, utrinque plus minus crystallino-papillosa, petiolis canaliculatis marginatis quasi amplexicaulis glandulosis. Flores in axilla nidulans, unus sessilis, cæteri

brevi-pedunculati terni vel septeni. Bracteæ bracteolæ scariosæ, acuminatæ. Calyx quinquepartitus, segmentis dorso carinatis cuspidatis margine membranaceis intus coloratis (rubris vel rarius albis) eum junioribus quinque alternis. Ovarium biloculare, 4-ovulatum, apice mitriformi bilobo (vel emarginato), lobis emarginatis. Styli 2, divaricati, longe stigmatosi. Fructus durus, circumscissus, opereulo bipartibili dispermo clauso; eupula membranacea, disperma, placenta vera centrali sed alternatim ad parietes coalita. Semina subcompressa, rugosa, albumine pauco.

Common in cultivated ground as well as in the desert: it is called *Itsit*, and is used to procure abortion by the natives. It is generally reddish or purple, but has rarely a green fruit and stalk. It is very different from *T. pentandra* β , DC. Prod. iii. 852, which is the *obcordata* of Roxburgh.

TRIANTHEMA CRYSTALLINA. Papillosa, foliis ellipticis (vel ovalibus v. spathulatis), floribus 5-6-andris monogynis, calyce pentagono nervoso, fructu dispermo opereulo cupuliformi aperto.

Arabia. India, from the Peninsula to the Punjab.

Diffusa, ramosissima, crystallino-glandulosa, ramis stellatim prostratis teretibus. Folia subopposita, crassa, elliptica, ovalia v. spathulata, vel in Pentepotamia elliptica margine revoluto semiteretia, petiolis marginatis glanduloso-fimbriatis (in ramis omnibus persistentibus mareidis). Flores terni (in *W.* & *A.* et *DC.* congesti), axillares, bibractcolati. Calyx pentagonus, 5-fidus, segmentis late cuneatis 5-7-nerviis, marcescens, subhyalinus, apertus. Stamina 5, vel potius 6, raro 7. Stylus 1. Ovarium truncatum, supra cupuliforme. Fructus dispermus, placenta laterali, opereulo aperto. Semina compressa, cochleata, rugosa, embryone albumen farinaceum paucum cingente.

This is found both in the Peninsula and Arabia with broader leaves than the Punjab form, and less crowded branches; but I cannot consider them even as varieties. It varies in having green or red branches. It is not common in cultivated places, but in the Rechnab desert there are miles of ground covered with it; it is eaten under the name of *Alethi* (as well as *Zygophyllum simplex* and *Tribulus alatus*). The women sweep up the seeds from the bare hard soil with little whisks, and they are then winnowed and sifted.

TRIANTHEMA HYDASPICA. Papillosa, prostrata, foliis crassis ovatis, floribus in dichotomia sessilibus solitariis 5-7-andris digynis, fructu polyspermo biloculo.

Pentepotamia and Sindh.

Annua? Prostrata, omnino plus minus crystallino-punctata, ramis teretibus glanduloso-puberulis coloratis dichotomis. Folia opposita, erassiuscula, ovata, obtusa, margine revoluto, petiolo membranaceo-dilatato.

Flores solitarii, sessiles in dichotomia. Calyx 5-fidus, in sinibus segmentorum dentibus 5 (ut in *Ammannia*), acute pentagonus, segmentis ovatis extus herbaceis in mucronem glandulosum (uno excepto) productis, intus plus minus petaloideis roseis, demum in fructu stellatim patentibus. Stamina 7 (*fide Stocks* 5), filamentis filiformibus, antheris roseis. Styli duo, disjuncti, incrassati, stigmatosi. Ovarium biloculare, pluri-ovulatum, placenta centrali. Fructus pyxiformis, circumscissus, operculo clauso 2-loculari; capsula bilocularis, loculis membranaceis hinc parietis membranis scjunctis ita ut capsula pseudo-4-locularis fingitur. Semina numerosa, 8-10 in utroque loculo, cochleæformia, testa nigra rugosissima, embryo albumen paucum farinaceum cingente, cotyledonibus planis.

This appears to be peculiar to the basin of the Indus. Dr. Stocks referred it, in his letters and herbarium, to the *Diplochonium* of Fenzl. It seems to be quite different from the original species of that genus, *D. uvarioide* from the Cape being polyandrous and with smooth shining seeds. The fruit, habit, and calyx agree with this; but *Trianthema obcordata* has numerous stamens and seeds, and therefore must be referred to *Diplochonium*, if this be not re-joined to *Trianthema*.

Leptadenia Jacquemontii, though often leafless as described by Decaisne, as often has linear leaves exactly like those of *L. Spartium*; but the form of the corona and the pubescence of the corolla are different.

Pentatropis spiralis differs both in flower and foliage from *P. microphylla*, the Peninsular species. (See Pl. I. fig. 9.)

The leaves of the Punjab species are from ovate to almost linear with a gradual acumination, whereas those of *microphylla* vary from oval to ovate with a short abrupt mucro. The laciniae of the corolla are erect, scarcely ever opening, and never reflexed, as are those of the latter, while the divisions of the outer row of the corona are blunt and rounded, not rather acutely calcarate as in *microphylla*.

Compare the dissections of *spiralis* by Decaisne (Ann. Sc. Nat. ii. 9, 11) with those of *microphylla* by Wight (Icones, ii. 352).

CEROPEGIA ESCULENTA. Volubilis, foliis carnosis ovatis linearibusve, umbellis multifloris, coronæ stamineæ lobis lateralibus obtusis.

Multan; Sindh.

Radix tuberosa, volubilis, glabra. Folia glabra, carnosia, ovato-oblonga vel linearia, 2-7 poll. longa, $\frac{1}{2}$ ad 2 lata. Umbellæ compositæ, multifloræ. Calyx brevissimus. Corolla vix pollice longa, basi et fauce inflata, tubo longo, laciniis brevibus apice coalitis, pallide viridi-purpurascens, intus

leviter barbatis. Corona lobis exterioribus obtusis, interioribus ligulatis multo longioribus. Folliculi divaricati, longe cylindrici, glabri.

The leaves (which are acid) and the tubers are eaten: called *Gahlot*.

This differs from *bulbosa* of Roxb. in the exterior lobes of the corona, which are blunt, and not acute as in *bulbosa*, which I have found at Banda. The flowers also are smaller, while the leaves are larger.

BOUCEROSIA EDULIS (Pl. I. fig. 1-8). Erecta, ramis subteretibus, foliis caducis, floribus pedicellatis geminis, corolla glabra laciniis subulatis.

Multan; Sindh.

Rhizoma stolonosum, crassum, ramis radicanibus, radicibus fibrosis.

Rami erecti, succulenti, subteretes, 4-sulcati. Folia opposita, cuneata v. elliptica, caduca. Pedicelli gemini, alares, graciles, subpenduli, demum erecti, bibracteati, bracteis subulatis minutis. Calyx 5-partitus, segmentis acutis pellucido-marginatis. Corolla 5-fida, utrinque glabra, venacea, basi purpureo-striata, tubo inflato hemisphærico, laciniis subulatis attenuatis reflexis. Corona 15-fida, segmentis 5 ligulatis in antheris incumbentibus, 10 intermediis brevioribus falcato-subulatis intus cavis purpurascens nectariferis. Pollinia gibba, apice pellucida. Folliculi erecti, teretes, lævissimi, glaberrimi, valde attenuati. Semina marginata, alata, longe comosa.

Edulis, subacida, sponte in Salvadoretis crescit, ibi colligenda in foro venditur sub nomine *Situn*.

I refer our Desert species of *Heliotropium* to *bicolor*, Hochst. & Steud. (no. 62, DC. ix. 546), and *marifolium*, Retz. (no. 66, p. 547). I cannot agree in uniting these and several other species to *strigosum*, as Dr. T. Anderson proposes in his 'Florula Adenensis'—at least I consider it premature; for though there are many points of resemblance, there are plenty of distinguishing marks. I have carefully examined all the specimens in the Kew and Linnean herbaria, and although there may be some which are too difficult to refer to the correct species without very minute and almost microscopic examination, I feel satisfied that it is safer to leave these forms as species till more thoroughly examined in living specimens.

The distinguishing marks may be taken, firstly, in the habit—*erect* (nos. 62, 63, 64, 67, 70, 72, DC.) or *prostrate* (65, 66, 71, &c.). The shape of the leaves—linear, linear-lanceolate, or elliptic or oval. The laciniæ of the calyx also give distinct marks: some are long, linear, and acute (62, 67, 72, 78; 7015, Wall.); others free, short, and blunt (63, 66, 70; 1389, 1392, Wight; 2092, Wall.). The

nuts also give good marks: some are almost smooth (77, 78; 1389, Wight); some smooth below and strigose above (64); others (as 62, 63, 66, 72; and 1390 of Wight) thickly strigose; some are almost exactly globose, but others distinctly four-lobed. The anthers in many have hairs, converting the apex into a little pencil, while in other species they are wanting and are either simply apiculate or even blunt. The stigma in *linifolium* is smaller and *cordiform* obclavate, in all the rest parasol-shaped, with the apicula shorter or longer according to the species.

The throat of the corolla is usually closed with hairs, but in this, which I have referred to *bicolor*, it is open and bare. I have not had an opportunity of examining this point in an Arabian specimen.

Finally, we find every shade of pubescence, from the soft down of *tenuifolium* (no. 67) to the densely strigose forms of *strigosum*, *marifolium*, and *scabrum*.

LIMEUM INDICUM, *Stocks, MSS.* Prostratum, foliis suboppositis inæqualibus oblique ovatis vel rotundis mucronatis glabris, cymis brevi-pedunculatis, petalis hyalinis obtusatis 3-dentatis, stam. 7, coccis lævibus depressis.

Sindh to Punjab.

Annua? Rami prostrati, velutini, ad nodos incrassati, ramulis alternatim brevioribus quaque axilla. Folia subopposita, oblique ovata v. rotundata, mucronata, integerrima, utrinque glabra, crassiuscula, petiolis brevibus subamplexicaulibus stipulam mentientibus. Cymæ brevissimæ, pedunculatæ, axillares vel supra-axillares, pedicellis bracteolatis, bractea scariosa acuta. Sepala 5, quineuncialia, ovata, acuta, herbacea, margine membranaceo albo. Petala 5, hyalina, unguiculata, obtusata, apice truncata, tridentata, cum sepalis alterna. Stamina 7, filamentis basi dilatatis in discum glandulosum subcoalitis persistentibus, antheris 2-lobis introrsis. Ovarium 2-lobum, stylis 2, lobis contrariis, loculis 1-ovulatis. Fructus dicoccus, depresso subsphæricus, lævis, indchiscens. Seminis testa membranacea. Embryo annularis, albumen farineum amplectens, cotyledonibus longis linearibus.

The habit is that of *Glinus* or *Gisekia*. It differs from the generic character as given in DC. or Endlicher in having opposite leaves and smooth cocci.

ÆRUA BOVII, *Webb.* Ramosissima, dioica, lanuginosa, foliis sessilibus linearibus mucronatis, bracteis scariosis subglabris, stylo stigmatibus brevioribus.

Deserto Rechnab.

Dioica, crecta, ramosissima, lanugine stellata brevi vestita. Folia alterna, linearia, basi attenuata, apice mucronata. Spicæ axillares terminales-

que simplices vel ramosæ ita ut tota planta panicula vasta videtur. Flores terni, congesti, bracteis scariose argenteis obtusis subglabris. Calyx 5-partitus, laciniis extus longe lanatis, duabus exterioribus majoribus scariosis, tribus interioribus herbaceis linea viridi vel rubra notatis angustioribus.

- ♂ Stamina in anulum connexa, staminodiis obtusis 2-dentatis coloratis, filamentis calyce longioribus purpureis antherisque purpureis, polline luteo. Ovarium minutum, stylo nullo.
- ♀ Cupula staminifera 10-dentata, dentibus alternis (staminibus abortivis) acutis. Stylus ramis stigmatiferis $1\frac{1}{2}$ brevior. Ovarium 1-loculum. Semen lucidum.

This species has been confused with *Javanica*, from which it differs in habit, leaves, and the minute character of the style and bracts. In *Javanica* the style is equal to the stigmatic branches, and the bracts are lanose, not glabrous. The true *Javanica* has short branches. *Javanica* has but few and rare male flowers (as remarked by Forskahl, p. 170), whereas *suaveolens* has as many male plants as female; and *Javanica* also is not sweet-scented. They both grow in the same neighbourhood, so that there is plenty of opportunity to compare them. I therefore consider *Æ. β. Bovii* is a distinct species rather than a variety as it has been considered by Webb in the Niger Flora, p. 173, and DC. Prod. xiii. p. 299.

PANICUM (Sect. xi. VIRGARIA, *Trin. ap. Steud. Gram.*) HYDASPICUM.

Foliis planis sparse pilosis, gluma exterior 3-nervia, superiore 7-nervia. Rechnab Bār.

Culmi subcompressi, geniculati, nodique glabri. Vagina laxa, glabra, os versus ciliata, ligula minute ciliato-membranacea. Folia plana, sparse pilosa, margine minutissime serrulata, utrinque 3-nervia, sæpe purpurascens. Paniculæ laxæ, ovatæ, pedunculo compressiusculo filiformi, ramis ramulisque capillaribus undulatis scabro-setosis. Locustæ ovoideæ, solitariæ, longe pedicellatæ. Gluma exterior flosculo plus duplo brevior late ovata, acuta, *trinervia*. Gluma superior 7-nervia, breviter mucronata. Flosculi inferioris palea inferne herbacea, semi-7-nervia, breviter mucronata; palea superne hyalina, elliptica, acutiuscula, integra.

- ♀ Floris superioris paleæ lævissimæ, muticæ. Lodiculæ majusculæ, ovario longiores, bilobæ, carnosæ. Ovarium læve. Styli 2, divergentes. Stigma purpureum. Stamina vix exserta. Antheræ fusæ.

This differs from the cultivated *miliare*, Lam. (no. 483 in Steud. Gram. p. 73) in the glumes. The nerves in the lower are much stronger than any in this section that I have observed, and shorter. The upper are 7-, not 9-13-nerved. From *coloratum*, Linn. (no. 478. *ib.*) it differs in the absence of the raised glands from which the

hairs rise in the vagina. *Repens*, Lam., *arenarium* (no. 476. *ib.*), and *paludosum*, Roxb. (no. 465. *ib.*) have blunt glumes, and live in water.

ANDROPOGON (CYMBOPOGON) ARIANI. Cæspitosus, foliis brevibus complanatis, pedicellis pilis albis locusta longioribus, glumis inferioribus 5-9-nerviis ciliatis, superioribus 3-nerviis.

Deserta; Punjab.

Dense cæspitosus. Folia plana, brevia, glaucescentia. Vaginæ glabræ, ligula membranacea palcacea. Culmi glabri, erecti, 1-3-pedales. Paniculæ foliaceæ; pedunculi articulati, articulis breviter barbatis, vaginulis margine membranaceis, cito marcidis, subconjugatis. Spicæ cylindricæ, pedunculos æquantés. Locustæ geminæ, una sessilis (♀), altera pedicellata (♂). Glumæ utriusque bicarinatæ, ciliatæ, acutæ, subbifidæ, carinis serrulatis. Flosculi sessilis paleæ hyalinæ, ciliatæ, superior bifida aristata, arista locustam æquantē. Lodiculæ grosse eroso-truncatæ, subbidentatæ. Flosculi ♂ pedicelli dense pilosi, pilis inæqualibus locustam æquantibus. Paleæ integræ, hyalinæ, serrulatæ, deciduæ. Antheræ luteæ. Stigmata aurantiaca.

There are several forms very much resembling one another, and which have been confused together in herbaria. This species differs from all in the plane, not convolute, leaves. *Circinatus*, Hochst. (Steud. Gr. no. 294, p. 387) differs from all in the indurated polished glume. *Oliverii*, Boiss. (no. 295. *ib.*; Desf., 288. *ib.*) has rough convolute leaves, longer than those of *laniger*. The pedicel and rachis have hairs equalling the floscules. The glumes are 5-nerved. *Laniger* (from Algiers) has much shorter convolute leaves, the pedicels not quite reaching to the floscules. The glumes 7-11-nerved.

There is another species, abundant in the lower Himalaya, differing in having longer, linear convolute leaves, spikes defracted, with much shorter hairs in the pedicels, and scarcely aromatic—almost the same as the Persian *Oliverii*.

ARISTIDA (CHÆTARIA) HYSTRICULA. Pusilla, glabra, gluma superiore acutata inferiorem ovulatam mucronulatam subduplo superante.

Sindh and Multan. (*Stocks*, No. 187 partim.)

Spithamæa, pallescens. Culmi graciles, glabri, striati. Vaginæ brevès, ore pilis albis, longe ciliatæ. Folia glabra, convoluta, pollicaria. Paniculæ brevès, paucifloræ. Gluma inferior ovata, acuta, carina serrulata in mucronem abeunte (2-linealis); superior sublævis, linearis, in mucronem hispidulum acutata (3-3½-linealis), quandoque fissa. Flosculus hispidulus, arista non articulata, stipite 8-10-lineali, setis subæqualibus 1-1½-pollicaribus hispido-scabris.

The habit is very unlike *Hystrix* (Linn. fil.; Steud. Gram. no. 99, p. 141), though the technical description is too much like.

ARISTIDA (ARTHATHERUM) MALLICA. Foliis scabris pilosis, glumis subæqualibus (inferiore paullo longiore) acuminatissimis in setula hispidula terminatis.

Multan.

Nana, vix spithamæa, culmis parce pilosis. Folia scabra. Glumæ in setula hispidula terminatæ, acuminatissimæ, longior paullo brevior (5-7-linealis) carina serrulata. Gluma superior lævis, 1-nervia (4½-6-linealis). Flosculus scaberrimus; arista paullo super caryopsem secedens, stipite scabro-hispido 8-9-lineali, setis duabus 10-12 lin., tertia 14-15-linealibus.

This species is technically most like *Royleana*, Trin. (Steud. Gr. no. 177, p. 143), but the habit is very different; it is of a reddish colour, and very dwarf. It seems to approach nearest to *A. lieocalycina*, Trin. (Steud. Gr. no. 120, p. 146), but I have not seen an authentic specimen of that; the proportion of the glumes also is at variance.

ARISTIDA ARTICULATA. Erecta, glabra, foliis subacerosis, panicula coarctata, glumis subæqualibus, arista ad apicem stipitis articulata.

Rechnab deserto.

Culmi erecti v. geniculatim decumbentes. Vaginæ nodique glabri. Ligula pilosa. Folia sesquipollicaria, subacerosa. Panicula coarctata. Glumæ hispidulo-scabræ; inferior paullo brevior, carinata, acuta, mucronulata; superior bifida, intra dentes setula mucronata. Flosculus striato-hispidus; arista in glumis latitans, ad apicem stipitis articulata, setis tribus subæqualibus 6-7-linealibus.

The habit is that of *rigescens* (R. S.; Steud. Gr. no. 100, p. 141); but I do not observe any other specimens of this species in the Kew herbarium, nor any in which the awn is jointed at the branching of the setæ.

ARISTIDA (STIPAGROSTIS) PLUMOSA (Linn.; Steud. Gr. no. 125, p. 141) (*lanata* of Forskahl).

This species I have found both at Jhung and in the sand-hills to the south of the Multan district. I cannot agree with Dr. T. Anderson in referring the Aden species to this. One of the original specimens in the Linnean herbarium is identical with this. The other seems to be rather the "*obtusa*" of Delile (no. 128, Steud. Gr. p. 144). Col. Munro, in his paper on the Linnean grasses, makes no remark on this second specimen, which assuredly is a different species from the true and original *plumosa*.

In his Aden Flora Dr. T. Anderson unites *A. vulgaris*, Trin. (Steud. Gr. no. 66) to *A. Adscensionis*, Linn. (no. 76); but the blunt truncate glumes appear to me to be a most distinct characteristic.

Unfortunately I have lost or mislaid all my meteorological tables. I append an abstract of the only months I have found.

1850.	Minimum.		Maximum.		Mean.	Direction of Wind.	Rain.		
	Extreme.	Mean.	Extreme.	Mean.					
April .	60°	73°	67.7	87°	108°	95°	81.8	13½ days N., 6½ S.	in. 0.27
May . .	66	88	76.7	95	118	108	93.35	{ 12½ N., 2 S., 6½ W., 2 N.E., 2 S.E., 2 S.W.	0
June .	76	89	83.6	99	117	111	97.66	6 N.-N.N.E., 24 S.-S.S.E.	0
July . .	70	87	79.4	88	113	106	92.8	{ 4½ N., 5 N.E., 5½ E., 9½ S., 5 S.W., 1½ W.	2.26
Aug. .	64	83	78.4	92	109	103	91.1	{ 12 N., 4 N.E., 3 E., 2 S.E., 8 S., 9½ S.W., 2 W.	0
Sept. .	69	78	72.9	97	108	99.6	86.2	{ 3⅔ N., 3½ N.E., 1 ½ E., 1½ S., 4½ S.W., 1 W.	0

DESCRIPTION OF THE PLATE.

- Fig. 1. *Boucerosia edulis*. Corolla opened out.
 2. Gynostegium and staminal crown, looking down.
 3. Ditto, the staminal crown opened out.
 4. Ditto, profile.
 5. Part of corona opened out.
 6. Ditto, magnified from the outside.
 7. Ditto, ditto, from the inner side.
 8. Ditto, one of the inner scales separated.
 9. Coronal leaf of *Pentatropis spiralis*, copied from Decaisne, Flora Sinaica.
 10. Coronal leaf of Multan form.
 11. Coronal leaf of *P. microphylla*, according to Wight's Icones.

I N D E X.

	Page		Page
Abelmoschus esculentus	185	Agrostis tenacissima, <i>Linn.</i>	41
Abroma, <i>Jacq.</i>	113, 120	Ahnfeldtia plicata, <i>J. Ag.</i>	171
Abutilæ	99	Aira, <i>Linn.</i>	41
Abutilon, <i>Gærtn.</i>	99, 104	— alpina, <i>Linn.</i>	42
Acanthaceæ	18, 192	— aquatica, <i>Linn.</i>	41
Acanthophyllum, <i>C. A. Mey.</i>	62, 63	— arundinacea, <i>Linn.</i>	41
Acrossanthes, <i>Presl</i>	77	— cærulea, <i>Linn.</i>	41
Adansonia, <i>Linn.</i>	100	— cæspitosa, <i>Linn.</i>	41
Adansonieæ	100	— canescens, <i>Linn.</i>	42
Adenogramma, <i>Presl</i>	77	— Capensis, <i>Linn.</i>	42
Adenonema, <i>Bunge</i>	68	— caryophyllea, <i>Linn.</i>	42
Adenostemma viscosum, <i>Forst.</i> . . .	12	— cristata, <i>Linn.</i>	41
Ægilops, <i>Linn.</i>	55	— flexuosa, <i>Linn.</i>	42
— caudata, <i>Linn.</i>	55	— minuta, <i>Linn.</i>	41
— exaltata, <i>Linn.</i>	55	— montana, <i>Linn.</i>	42
— incurvata, <i>Linn.</i>	55	— præcox, <i>Linn.</i>	42
— ovata, <i>Linn.</i>	55	— spicata, <i>Linn.</i>	41
— squarrosa, <i>Linn.</i>	55	— subspicata, <i>Linn.</i>	41
Ærua Bovii, <i>Webb</i>	206	Aizooneæ	189
Agarum fimbriatum, <i>Harv.</i>	166	Alaria marginata, <i>Post. & Rupr.</i> . .	165
Agrocharis gracilis, <i>H. f.</i>	9	— Pylaii, <i>Grev.</i>	165
Agrostideæ	196	Algæ from the North-west coast of North America, chiefly from Vancouver's Island, W. H. Har- vey on a collection of	157
Agrostis, <i>Linn.</i>	40	Alopecurus, <i>Linn.</i>	39
— alba, <i>Linn.</i>	40	— agrestis, <i>Linn.</i>	39
— arundinacea, <i>Linn.</i>	40	— geniculatus, <i>Linn.</i>	39
— aurea, <i>Linn.</i>	41	— hordeiformis, <i>Linn.</i>	39
— australis, <i>Linn.</i>	41	— Monspeliensis, <i>Linn.</i>	39
— bromoides, <i>Linn.</i>	41	— paniceus, <i>Linn.</i>	39
— Calamagrostis, <i>Linn.</i>	40	— pratensis, <i>Linn.</i>	39
— canina, <i>Linn.</i>	40	Alsianthe, <i>Reich.</i>	71
— capillaris, <i>Linn.</i>	40	Alsine, <i>Linn.</i>	69
— Cornucopiæ, <i>Linn.</i>	41	Alsineæ	66
— cruciata, <i>Linn.</i>	41	Althæa, <i>Cav.</i>	99
— Indica, <i>Linn.</i>	40	Amaranthaceæ	193
— interrupta, <i>Linn.</i>	41	Amaryllideæ	194
— maritima, <i>Linn.</i>	41	Ampelideæ	186
— matrella, <i>Linn.</i>	41	Amphiroa Californica, <i>Dene.</i> . . .	169
— Mexicana, <i>Linn.</i>	41	— corymbosa, <i>Harv.</i>	169
— miliacea, <i>Linn.</i>	40	— epiphlegnoides, <i>J. Ag.</i>	169
— minima, <i>Linn.</i>	40	Amphorchis, <i>Thouars</i>	139
— paradoxa, <i>Linn.</i>	40	— occidentalis, <i>Lindl.</i>	139
— pumila, <i>Linn.</i>	41	Anacampseros, <i>Linn.</i>	74
— radiata, <i>Linn.</i>	41	Anacardiaceæ	186
— serotina, <i>Linn.</i>	41		
— Spica Venti, <i>Linn.</i>	40		
— stolonifera, <i>Linn.</i>	40		

	Page		Page
Andropogon, <i>Linn.</i>	52	Aristida articulata, <i>Edgew.</i>	209
— alopecuroides, <i>Linn.</i>	52	— arundinacea, <i>Linn.</i>	49
— (Cymbopogon) Ariani, <i>Edgew.</i>	208	— (Chætaria) hystricula, <i>Edgew.</i>	208
— barbatum, <i>Linn.</i>	53	— (Arthratherum) Mallica, <i>Edg.</i>	209
— bicornis, <i>Linn.</i>	52	— plumosa, <i>Linn.</i>	49
— caricosum, <i>Linn.</i>	53	— (Stipagrostis) plumosa, <i>Edgew.</i>	209
— contortum, <i>Linn.</i>	52	Arundinæ	196
— cymbarium, <i>Linn.</i>	53	Arundo, <i>Linn.</i>	48
— distachyon, <i>Linn.</i>	52	— arcuaria, <i>Linn.</i>	49
— divaricatum, <i>Linn.</i>	52	— Bambos, <i>Linn.</i>	48
— fasciculatum, <i>Linn.</i>	53	— Calamagrostis, <i>Linn.</i>	49
— Gryllus, <i>Linn.</i>	53	— Donax, <i>Linn.</i>	49
— hirtum, <i>Linn.</i>	52	— Epigejos, <i>Linn.</i>	49
— insulare, <i>Linn.</i>	53	— Phragmites, <i>Linn.</i>	49
— Ischæmum, <i>Linn.</i>	52	Arversia, <i>Cambess.</i>	73
— muticum, <i>Linn.</i>	53	Asclepiadacæ	190
— Nardus, <i>Linn.</i>	52	Asphodeleæ	194
— nutans, <i>Linn.</i>	52	Astiria, <i>Lindl.</i>	112
— polydactylon, <i>Linn.</i>	53	Avena, <i>Linn.</i>	47
— prostratum, <i>Linn.</i>	53	— bromoides, <i>Linn.</i>	48
— quadrivalvis, <i>Linn.</i>	53	— elatior, <i>Linn.</i>	48
— Ravennæ, <i>Linn.</i>	53	— fatua, <i>Linn.</i>	48
— scabrum, <i>Linn.</i>	53	— flavescens, <i>Linn.</i>	48
— Schœnantlus, <i>Linn.</i>	52	— fragilis, <i>Linn.</i>	48
Andropogoneæ	195	— hispida, <i>Linn.</i>	48
Angræcum, <i>Thouars</i>	134	— Lœfflingiana, <i>Linn.</i>	48
— arcuatum, <i>Lindl.</i>	136	— nuda, <i>Linn.</i>	48
— capitatum, <i>Lindl.</i>	137	— patula, <i>Linn.</i>	48
— caudatum, <i>Lindl.</i>	136	— Pennsylvanica, <i>Linn.</i>	48
— distichum, <i>Lindl.</i>	136	— pratensis, <i>Linn.</i>	48
— ichneumoneum, <i>Lindl.</i>	136	— pubescens, <i>Linn.</i>	48
— imbricatum, <i>Lindl.</i>	137	— sativa, <i>Linn.</i>	48
— infundibulare, <i>Lindl.</i>	136	— sesquitertia, <i>Linn.</i>	48
— monodon, <i>Lindl.</i>	135	— Sibirica, <i>Linn.</i>	47
— pellucidum, <i>Lindl.</i>	134	— sterilis, <i>Linn.</i>	48
— pertusum, <i>Lindl.</i>	135	— stipiformis, <i>Linn.</i>	48
— subulatum, <i>Lindl.</i>	134	Avenæ	196
— tridens, <i>Lindl.</i>	135	Ayenia, <i>Linn.</i>	113, 120
— vagans, <i>Lindl.</i>	135	Babington, Charles C., on the dis- covery of <i>Carex Ericetorum</i> , <i>Poll.</i> , as a native of Britain	30
Anoda, <i>Cav.</i>	99	Baitaria, <i>Ruiz & Pavon</i>	75
Anthocleista scandens, <i>H. f.</i>	16	Balardia, <i>Cambess.</i>	72
Antholoma	123	Balsaminæ	6
Anthospermum asperuloides, <i>H. f.</i>	11	Bambuseæ	196
Anthoxanthum, <i>Linn.</i>	35	Bastardia, <i>H. B. & K.</i>	99, 104
— adnatum, <i>Linn.</i>	35	Batrachospermum moniliforme, <i>Ag.</i>	176
— Indicum, <i>Linn.</i>	35	Bentham, G., notes on the Malvacæ and Sterculiæ	97
— paniculatum, <i>Linn.</i>	35	— on Inocarpus	146
Apluda, <i>Linn.</i>	54	Bignoniacæ	190
— aristata, <i>Linn.</i>	54	Blæria spicata, <i>Hochst.</i>	15
— digitata, <i>Linn.</i>	54	Bocoa, <i>Aubl.</i>	149, 150
— mutica, <i>Linn.</i>	54	Bolbophyllum, <i>Thouars</i>	125
— Zeugites, <i>Linn.</i>	54	—, sp. nov.	22
Apocynæ	190	— apetalum, <i>Lindl.</i>	127
Apophragma	142	— calamarium, <i>Lindl.</i>	125
Araliacæ	10	— cochleatum, <i>Lindl.</i>	125
Arenaria, <i>Linn.</i>	68	— comatum, <i>Lindl.</i>	128
Aristida, <i>Linn.</i>	49		
— Adscensionis, <i>Linn.</i>	49		
— Americana, <i>Linn.</i>	49		

	Page		Page
<i>Bolbophyllum distans</i> , <i>Lindl.</i>	125	<i>Callophyllis flabellulata</i> , <i>Harv.</i>	171
— <i>Elaidum</i> , <i>Lindl.</i>	127	— <i>laciniata</i> , <i>Kütz.</i>	172
— <i>falcipectalum</i> , <i>Lindl.</i>	128	— <i>variegata</i> , <i>Kütz.</i>	172
— <i>gravidum</i> , <i>Lindl.</i>	126	Calycifloræ	186
— <i>intertextum</i> , <i>Lindl.</i>	127	Calyptridium, <i>Nutt.</i>	74
— <i>lupulinum</i> , <i>Lindl.</i>	126	Campanulaceæ	14
— <i>micropetalum</i> , <i>Lindl.</i>	127	Capparideæ	184
— <i>pavimentatum</i> , <i>Lindl.</i>	128	Cardionema, <i>DC.</i>	77
— <i>tenuicaule</i> , <i>Lindl.</i>	126	<i>Carex Boryana</i> , <i>Schkuhr</i>	22
Bombaceæ	100, 107	— <i>Ericetorum</i> as a native of Britain, C. C. Babington on the discovery of	30
<i>Bombax</i> , <i>Linn.</i>	100, 108	— <i>Wahlenbergiana</i> , <i>Boott</i>	22
Boragineæ	191	Carpodiptera, <i>Griseb.</i>	109
<i>Boschia</i> , <i>Korth.</i>	100	<i>Carpomitra Cabrerae</i> , <i>Kütz.</i>	164
<i>Boucerosia edulis</i> , <i>Edgew.</i>	205	Carruthers, W., on some species of Oak from N. China, collected by Dr. Daniell	31
<i>Brachypodium sylvaticum</i> , <i>R. & S.</i>	23	Caryophylleæ	6, 57, 61, 185
<i>Brachystemma</i> , <i>Don</i>	68	<i>Catasctum tridentatum</i> , Chas. Dar- win on three remarkable sexual forms of	151
<i>Briza</i> , <i>Linn.</i>	44	<i>Cavanillesia</i> , <i>Ruiz & Pav.</i>	100
— <i>Eragrostis</i> , <i>Linn.</i>	44	<i>Cenchrus</i> , <i>Linn.</i>	55
— <i>maxima</i> , <i>Linn.</i>	44	— <i>capitatus</i> , <i>Linn.</i>	55
— <i>media</i> , <i>Linn.</i>	44	— <i>ciliaris</i> , <i>Linn.</i>	55
— <i>minima</i> , <i>Linn.</i>	44	— <i>echinatus</i> , <i>Linn.</i>	55
— <i>virens</i> , <i>Linn.</i>	44	— <i>frutescens</i> , <i>Linn.</i>	55
<i>Bromus</i> , <i>Linn.</i>	46	— <i>granularis</i> , <i>Linn.</i>	55
— <i>arvensis</i> , <i>Linn.</i>	46	— <i>lappaceus</i> , <i>Linn.</i>	55
— <i>ciliatus</i> , <i>Linn.</i>	46	— <i>muricatus</i> , <i>Linn.</i>	55
— <i>cristatus</i> , <i>Linn.</i>	46	— <i>racemosus</i> , <i>Linn.</i>	55
— <i>distachyos</i> , <i>Linn.</i>	47	— <i>tribuloides</i> , <i>Linn.</i>	55
— <i>geniculatus</i> , <i>Linn.</i>	47	<i>Ceramium cancellatum</i> , <i>Ag.</i>	175
— <i>giganteus</i> , <i>Linn.</i>	46	— <i>diaphanum</i> , <i>Ag.</i>	175
— <i>hordeaceus</i> , <i>Linn.</i>	46	— <i>rubrum</i> , <i>Ag.</i>	175
— <i>inermis</i> , <i>Linn.</i>	47	— <i>tenuissimum</i> , <i>Ag.</i>	175
— <i>Madritensis</i> , <i>Linn.</i>	46	<i>Cerastium</i> , <i>Linn.</i>	66
— <i>mollis</i> , <i>Linn.</i>	46	<i>Cerdia</i> , <i>Moz. & Sess.</i>	73
— <i>pinnatus</i> , <i>Linn.</i>	46	<i>Ceropegia esculenta</i> , <i>Edgew.</i>	204
— <i>purgans</i> , <i>Linn.</i>	46	<i>Cheirolæna</i> , <i>Benth.</i>	123
— <i>racemosus</i> , <i>Linn.</i>	47	<i>Cheirostemon</i> , <i>Humb. & Bonpl.</i>	100
— <i>ramosus</i> , <i>Linn.</i>	47	<i>Cherleria</i>	70
— <i>rigens</i> , <i>Linn.</i>	47	Chlorideæ	196
— <i>rubens</i> , <i>Linn.</i>	46	Chlorospermeæ	176
— <i>scoparius</i> , <i>Linn.</i>	46	<i>Chondria atropurpurea</i> , <i>Harv.</i>	168
— <i>secalinus</i> , <i>Linn.</i>	46	<i>Chondrus affinis</i> , <i>Harv.</i>	173
— <i>sterilis</i> , <i>Linn.</i>	46	<i>Chorda lomentaria</i> , <i>Grev.</i>	167
— <i>stipoides</i> , <i>Linn.</i>	47	<i>Chorisia</i> , <i>H. B. & K.</i>	100
— <i>tectorum</i> , <i>Linn.</i>	46	<i>Cicendia</i>	143
<i>Buettneria</i> , <i>Linn.</i>	113	— <i>exaltata</i>	143
<i>Buettneriaceæ</i>	110	— <i>fastigiata</i>	143
<i>Buettneriæ</i>	113	— <i>filiformis</i>	144
<i>Buffonia</i>	71	— <i>Poeppigii</i>	143
<i>Calamintha Simensis</i> , <i>Benth.</i>	18	— <i>pusilla</i>	143
<i>Calandrinia</i> , <i>H. B. & K.</i>	74	— <i>quadrangularis</i>	144
<i>Calanthe</i> , <i>R. Brown</i>	129	— <i>stricta</i>	143
— <i>corymbosa</i> , <i>Lindl.</i>	129	<i>Cinna</i> , <i>Linn.</i>	35
—, <i>sp. nov.?</i>	21	— <i>arundinacea</i> , <i>Linn.</i>	35
<i>Callinhoe</i> , <i>Nutt.</i>	99	<i>Citrullus fistulosus</i> , <i>Stocks</i>	202
<i>Callithamnion Americanum</i> , <i>Harv.</i>	175		
— <i>Arbuscula</i>	175		
— <i>floccosum</i>	176		
— <i>polyspermum</i> , <i>Ag.</i>	175		
— <i>subulatum</i> , <i>Harv.</i>	175		
— <i>thuyoideum</i> , <i>Ag.</i>	175		

	Page		Page
Cladophora arcta	176	Cynosurus Indicus, <i>Linn.</i>	45
— glaucescens, <i>Griff.</i>	176	— Lima, <i>Linn.</i>	44
— glomerata, <i>Linn.</i>	177	— paniccus, <i>Linn.</i>	45
— lætevirens, <i>Dillw.</i>	177	— Uniolæ, <i>Linn. f.</i>	45
Claoxylon (Athroandra) Barteri, <i>H. f.</i>	20	— virgatus, <i>Linn.</i>	45
— (—) Mannii, <i>H. f.</i>	20	Cyperaceæ	22, 194
Clarence Peak, Fernando Po, Dr. J.		Cystoclonium gracilarioides, <i>Harv.</i>	171
D. Hooker on the vegetation of.	1	Cystophyllum Lepidium, <i>Rupr.</i> . .	163
— —, account of the ascent of,		Cytisus Mannii, <i>H. f.</i>	8
by Mr. Gustav Mann	27	Dactylis, <i>Linn.</i>	44
Claytonia, <i>Linn.</i>	74	— ciliaris, <i>Linn.</i>	44
Clematis Simensis, <i>Fres.</i>	4	— cynosuroides, <i>Linn.</i>	44
Codium tomentosum, <i>Harv.</i>	176	— glomerata, <i>Linn.</i>	44
Cœlanthium, <i>E. Mey.</i>	75, 77	— lagopoides, <i>Linn.</i>	44
Cœlostegia, <i>Benth.</i>	123	Darwin, Charles, on three re-	
Coix, <i>Linn.</i>	51	markable sexual forms of Cata-	
— Lachryma Jobi, <i>Linn.</i>	51	setum tridentatum, an orchid, in	
Cola, <i>Schott</i>	111	the possession of the Linnean	
Cometes, <i>Burm.</i>	77	Society	151
Commelynaceæ	21	Decaschistia, <i>W. & Arn.</i>	99
Commersonia, <i>Forst.</i>	113	Delesseria alata, <i>Lamour.</i>	170
Compositæ	11, 189	— hypoglossum, <i>Lamour.</i>	170
Conferva floccosa, <i>Ag.</i>	177	Deschampsia cæspitosa, <i>P. B.</i> . . .	23
— rivularis, <i>Ag.</i>	177	Desmarestia aculeata, <i>Lamour.</i> . .	164
Constantinea Sitchensis, <i>Post. &</i>		— ligulata, <i>Lamour.</i>	164
<i>Rupr.</i>	172	— viridis, <i>Lamour.</i>	164
Convolvulaceæ	190	Dianthus, <i>Linn.</i>	62
Corallina officinalis, <i>Linn.</i>	169	Dicarpidium, <i>F. Müll.</i>	113
Corchorus capsularis	185	Dicellostyles, <i>Benth.</i>	122
— depressus	185	Dichranthus, <i>Webb</i>	77
— fascicularis	186	Dicliptera maculata, <i>Nees?</i>	18
— olitorius	185	Dicrocephala oblonga, <i>H. f.</i>	12
— trilocularis	185	Dolophragma	69
Cordiaceæ	191	Dombeya, <i>Cav.</i>	112, 115
Cornucopiæ, <i>Linn.</i>	36	Dombeyæ	112
— alopecuroides, <i>Linn.</i>	36	Drypis, <i>Linn.</i>	62
— cucullatum, <i>Linn.</i>	36	Durio, <i>Rumph.</i>	100
Corollifloræ	190	Durionæ	100, 110
Corrigiola, <i>Linn.</i>	77	Ectocarpus littoralis, <i>Harv.</i>	167
Corymbis, <i>Thouars</i>	138	— oviger, <i>Harv.</i>	167
— disticha, <i>Lindl.</i>	138	— siliculosus, <i>Lyngb.</i>	167
Costaria Turneri, <i>Grev.</i>	166	Edgeworth, M. P., Florula Mallica	179
Coutoubea volubilis, A. H. R. Grise-		Elatinaceæ	184
bach on	140	Elisanthe, <i>Fenzl</i>	65
Cristaria, <i>Cav.</i>	99	Elymus, <i>Linn.</i>	49
Cruciferae	183	— arenarius, <i>Linn.</i>	49
Cucubalus, <i>Linn.</i>	62, 64	— Canadensis, <i>Linn.</i>	49
Cucurbitaceæ	188	— caninus, <i>Linn.</i>	50
Cullenia, <i>Wright</i>	100	— Caput Medusæ, <i>Linn.</i>	50
Cyanotis Abyssinica, <i>A. Rich.</i>	21	— Europæus, <i>Linn.</i>	50
Cymbidium, <i>Swartz</i>	134	— Hystrix, <i>Linn.</i>	50
— adenoglossum, <i>Lindl.</i>	134	— Sibiricus, <i>Linn.</i>	49
Cynosurus, <i>Linn.</i>	44	— Virginicus, <i>Linn.</i>	50
— Ægyptiacus, <i>Linn.</i>	45	Endocladia muricata, <i>J. Ag.</i>	173
— aureus, <i>Linn.</i>	45	Endogenes	194
— cæruleus, <i>Linn.</i>	44	Enteromorpha compressa, <i>Link</i>	176
— Coracanus, <i>Linn.</i>	45	— intestinalis, <i>Link</i>	176
— cristatus, <i>Linn.</i>	44	Epipogium, <i>Gmelin</i>	137
— durus, <i>Linn.</i>	44	— nutans, <i>Lindl.</i>	137
— echinatus, <i>Linn.</i>	44	Equisetaceæ	197

	Page		Page
Eremogone, <i>Reich.</i>	71	Gigartina mamillosa, <i>J. Ag.</i>	172
Ericææ	15	— mollis, <i>Bail. & Harv.</i>	173
Ericinella Mannii, <i>H. f.</i>	16	— radula, <i>J. Ag.</i>	172
Eriodendron, <i>DC.</i>	100	Gladiolus Illyricus, <i>A. G. More</i> on the discovery of, in the Isle of Wight	177
Eriolæna, <i>DC.</i>	112	Glinus, <i>Linn.</i>	75, 76
Eriolæneæ	112	Gloiosiphonia capillaris, <i>Carm.</i>	174
Etaballia, <i>Benth.</i>	149, 150	Glossostemon, <i>Desf.</i>	113, 117
— Guianensis	150	Gnetaceæ	194
Eulophia, <i>R. Brown</i>	131	Goepertia, <i>Griseb.</i>	141
— Guineensis, <i>Lindl.</i>	131	— volubilis, <i>Gr.</i>	141
— longicollis, <i>Lindl.</i>	132	Goethea, <i>Nees & Mart.</i>	99, 106
— lurida, <i>Lindl.</i>	132	Gomphia micrantha, <i>H. f.</i>	8
— lutea, <i>Lindl.</i>	132	Gossypium, <i>Linn.</i>	100
— virilis, <i>Lindl.</i>	132	— herbaceum	185
Eumalveæ	99	Gouffeia	69
Euphorbia (<i>Esula</i>) ampla, <i>H. f.</i>	20	Gracilaria confervoides, <i>Grev.</i>	170
Euphorbiaceæ	20, 193	Grahamia, <i>Gill</i>	74
Facchinia, <i>Reich.</i>	71	Gramineæ	23, 194
Festuca, <i>Linn.</i>	45	Granateæ	188
— amethystina, <i>Linn.</i>	45	Grasses of the Linnean Herbarium, Col. Munro on the identification of	33
— bromoides, <i>Linn.</i>	45	Grisebach, <i>A. H. R.</i> , notes on Cou- toubea volubilis, <i>Mart.</i>	140
— calycina, <i>Linn.</i>	45	Guazuma, <i>Plum.</i>	113, 120
— cristata, <i>Linn.</i>	45	Guichenotia, <i>Gay</i>	113, 122
— decumbens, <i>Linn.</i>	45, 46	Guilleminea, <i>H. B. & K.</i>	77
— dumetorum, <i>Linn.</i>	46	Gymnandropogon, sp. ?, <i>Schimp.</i>	23
— duriuscula, <i>Linn.</i>	45	Gymnocarpos, <i>Forsk.</i>	77
— elatior, <i>Linn.</i>	45	Gymnosciadium ?	10
— fluitans, <i>Linn.</i>	45	Gynura vitellina, <i>Benth.</i>	9
— fusca, <i>Linn.</i>	45	Gypsophila, <i>Linn.</i>	62, 63
— maritima, <i>Linn.</i>	45	Habenaria, <i>W.</i>	139
— Myurus, <i>Linn.</i>	45	—, sp. nov.	22
— ovina, <i>Linn.</i>	45	— macrandra, <i>Lindl.</i>	139
— phœnicoides, <i>Linn.</i>	46	— paludosa, <i>Lindl.</i>	139
— reptatrix, <i>Linn.</i>	45	— præalta, <i>Lindl.</i>	140
— rubra, <i>Linn.</i>	45	— stenochila, <i>Lindl.</i>	139
— Schimperiana, <i>A. Rich.</i>	23	Habrosia, <i>Fenzl</i>	77
— serotina, <i>Linn.</i>	46	Halosaccion hydrophora, <i>Ag.</i>	173
— spadicea, <i>Linn.</i>	46	Halymenia ligulata, <i>J. Ag.</i>	173
— spinosa, <i>Linn. f.</i>	46	Hampea, <i>Schlecht.</i>	100
Filices	197	Hannafordia, <i>F. Müll.</i>	113, 122
Florula Mallica, by <i>M. P. Edge-</i> <i>worth</i>	179	Harvey, <i>W. H.</i> , notice of a collec- tion of Algæ made on the North- west coast of North America, chiefly at Vancouver's Island, by David Lyall, <i>M.D., R.N.</i> , in the years 1859-61	157
Fouquieria, <i>H. B. & K.</i>	75	Helichrysum (<i>Chionostemma</i> ?) chrysocoma, <i>C. S. Schultz</i>	13
Frankeniaceæ	185	— (<i>Xerochlæna</i>) fœtidum, <i>Cass.</i>	13
Fremontia, <i>Torr.</i>	100	— (<i>Chionostemma</i>) globosum, <i>C. H. Schultz</i>	13
Fucus, <i>Linn.</i>	163	— (<i>Achyrocline</i>) Hochstetteri, <i>C. H. Schultz</i>	13
— furcatus, <i>Ag.</i>	163	— (<i>Xerochlæna</i>) Mannii, <i>H. f.</i>	12
— vesiculosus (var. <i>evesiculosus</i>), <i>J. Ag.</i>	163	Helicterææ	111
Fugosia, <i>Juss.</i>	100		
Galeandra, <i>Lindl.</i>	133		
— gracilis, <i>Lindl.</i>	133		
— longibracteata, <i>Lindl.</i>	133		
Galium Aparine, <i>Linn.</i> (var. <i>hama-</i> <i>tum</i>)	11		
— rotundifolium, <i>Linn.</i>	11		
Gaya, <i>H. B. & K.</i>	99		
Gentianeæ	16, 190		
Geraniaceæ	6, 186		
Geranium Simense	6		

	Page		Page
Helicteres, <i>Linn.</i>	112	Iridæa cordata, <i>J. Ag.</i>	173
Heliosperma, <i>Reich.</i>	65	Ischæmum, <i>Linn.</i>	54
Heliotropium bicolor, <i>Hochst. &</i> <i>Steud.</i>	205	— aristatum, <i>Linn.</i>	54
Heritiera, <i>Ait.</i>	111	— murinum, <i>Forst.</i>	54
Hermannia, <i>Linn.</i>	112	— muticum, <i>Linn.</i>	54
Hermannieæ	112	Isolepis trifida	22
Hernandia	147	Julostyles, <i>Thw.</i>	100, 106
Herniaria, <i>Linn.</i>	77	Junceæ	22
Herrania, <i>Goud.</i>	113	Kallymenia reniformis, <i>J. Ag.</i>	172
Hibisceæ	99	Keraudrenia, <i>Gay</i>	113, 122
Hibiscus, <i>Linn.</i>	100, 107	Kitaibelia, <i>Willd.</i>	99
— laguneoides, <i>Edgew.</i>	185, 199	Kleinhovia, <i>Linn.</i>	112
— micranthus, <i>Linn.</i>	185	Kosteletzkya, <i>Presl</i>	99
Hoheria, <i>A. Cunn.</i>	99	Krascheninikowia, <i>Turcz.</i>	67
Holcus, <i>Linn.</i>	53	Kydia, <i>Roxb.</i>	99
— bicolor, <i>Linn.</i>	54	— axillaris, <i>Thw.</i>	122
— Halepensis, <i>Linn.</i>	53	— jujubifolia, <i>Griff.</i>	122
— lanatus, <i>Linn.</i>	53	Kyllingia macrocephala, <i>A. Rich.</i>	22
— latifolius, <i>Linn.</i>	54	Labiatae	17, 192
— laxus, <i>Linn.</i>	53	Lagunaria, <i>Don</i>	100
— mollis, <i>Linn.</i>	53	Lagurus, <i>Linn.</i>	48
— odoratus, <i>Linn.</i>	53	— cylindricus, <i>Linn.</i>	48
— pertusus, <i>Linn.</i>	54	— ovatus, <i>Linn.</i>	48
— saccharatus, <i>Linn.</i>	53	Lahia, <i>Hassk.</i>	100
— serratus, <i>Linn.</i>	54	Laminaria apoda, <i>Harv.</i>	167
— Sorghum, <i>Linn.</i>	53	— dermatodca, <i>De la Pyl.</i>	166
— spicatus, <i>Linn.</i>	53	— fascia, <i>Ag.</i>	167
— striatus, <i>Linn.</i>	53	Larbrea, <i>A. de St. Hil.</i>	67
Holosteum, <i>Linn.</i>	67	Lasiopetaleæ	113, 121
Honckeneya	70	Lasiopetalum, <i>Smith</i>	113, 122
Hooker, J. D., on the vegetation of Clarence Peak, Fernando Po; with descriptions of the plants collected by Mr. Gustav Mann on the higher parts of that mountain	1	Lastarria, <i>A. Gray</i>	77
Hordeæ	196	Laurencia pinnatifida, <i>Lamour.</i>	169
Hordeum, <i>Linn.</i>	50	Lavatera, <i>Linn.</i>	99
— bulbosum, <i>Linn.</i>	50	Lawrenca	103
— distichon, <i>Linn.</i>	50	Leguminosæ	8, 187
— hexastichon, <i>Linn.</i>	50	Leptadenia Jacquemontii, <i>Dene.</i>	204
— jubatum, <i>Linn.</i>	50	Lepyrodiclis	70, 71
— murinum, <i>Linn.</i>	50	Leucostemma, <i>Benth.</i>	68
— nodosum, <i>Linn.</i>	50	Leucothoë angustifolia, var. β , <i>DC.</i>	15
— vulgare, <i>Linn.</i>	50	Lewisia, <i>Pursh</i>	74
— Zeocriton, <i>Linn.</i>	50	Limeum Indicum, <i>Stocks</i>	206
Hormotrichum Carmichaelii, <i>Harv.</i>	177	Limosella aquatica, <i>Linn.</i>	19
Howittia, <i>F. Müll.</i>	99	Lindley, J., West-African Tropical Orchids	123
Hydrurus penicillatus, <i>Ag.</i>	177	Liparis, <i>Richard</i>	125
Hymenena fimbriata, <i>P. & R.</i>	170	— Guineensis, <i>Lindl.</i>	125
— latissima, <i>Harv.</i>	170	—, sp. ?	125
Hypericineæ	6	Lisianthea	145
Hypericum angustifolium, <i>Lamk.</i>	6	Lisianthus	144
Illecebrum, <i>Linn.</i>	77	Lissochilus, <i>R. Br.</i>	133
Impatiens bicolor, <i>H. f.</i>	7	— arenarius, <i>Lindl.</i>	133
— filicornu, <i>H. f.</i>	6	— longifolius, <i>Benth.</i>	133
— hians, <i>H. f.</i>	7	— purpuratus, <i>Lindl.</i>	133
— Mannii, <i>H. f.</i>	7	— roseus, <i>Lindl.</i>	133
Inocarpus, <i>Forst.</i> , <i>G. Bentham</i> on, 146, 149		Lobelia (Tupa) columnaris, <i>H. f.</i>	14

	Page		Page
<i>Lolium temulentum</i> , <i>Linn.</i>	49	<i>Minuartia</i>	69
— <i>tenuë</i> , <i>Linn.</i>	49	<i>Mniarum</i> , <i>Forst.</i>	77
<i>Luzula campestris</i> , <i>Linn.</i>	22	<i>Modiola</i> , <i>Mœench.</i>	99
<i>Lyallia</i> , <i>H. f.</i>	73	<i>Mollugineæ</i>	60, 75, 185
<i>Lychnis</i> , <i>Linn.</i>	62, 63, 64	<i>Mollugo</i> , <i>Linn.</i>	75
<i>Lygeum</i> , <i>Linn.</i>	36	<i>Monochlamydeæ</i>	192
— <i>spartum</i> , <i>Linn.</i>	36	<i>Monocosmia</i> , <i>Fenzl</i>	74
<i>Lysiosepalum</i> , <i>F. Müll.</i>	113, 122	<i>Monsonia Mallica</i>	200
<i>Macarthuria</i> , <i>Endl.</i>	75	<i>Montezuma</i> , <i>DC.</i>	100
<i>Macrocystis pyrifera</i> , <i>Ag.</i>	164	<i>Montia</i> , <i>Linn.</i>	74
<i>Mæsa Indica</i> , <i>A. DC.</i>	16	<i>More</i> , A. G., on the discovery of <i>Gladiolus Illyricus</i> , <i>Koch</i> , in the Isle of Wight	177
<i>Mahernia</i> , <i>Linn.</i>	112	<i>Moringaceæ</i>	186
<i>Malachium</i> , <i>Fries</i>	67	<i>Munro</i> , Col. W., on the identifica- tion of the Grasses of Linnæus's herbarium	33
<i>Malachra</i> , <i>Linn.</i>	99	<i>Musci</i>	197
<i>Malope</i> , <i>Linn.</i>	98	<i>Myrodia</i> , <i>Schreb.</i>	111, 114
<i>Malopeæ</i>	98	<i>Myrsineæ</i>	16
<i>Malva</i> , <i>Linn.</i>	99, 101	<i>Napæa</i> , <i>Linn.</i>	99
<i>Malvaceæ</i>	185	<i>Nardus</i> , <i>Linn.</i>	35
—, G. Bentham on the	97, 98	— <i>aristata</i> , <i>Linn.</i>	35
<i>Malvastrum</i> , <i>A. Gray</i>	99	— <i>articulata</i> , <i>Linn.</i>	35
<i>Malvaviscus</i> , <i>Dillen.</i>	99, 106	— <i>ciliaris</i> , <i>Linn.</i>	35
<i>Mango</i> (<i>Mangifera Indica</i>), M. T. Masters on an unusual mode of germination in the	24	— <i>Gangites</i> , <i>Linn.</i>	35
<i>Manisuris</i> , <i>Linn.</i>	54	— <i>Indica</i> , <i>Linn.</i>	35
— <i>Myurus</i> , <i>Linn.</i>	54	— <i>stricta</i> , <i>Linn.</i>	35
<i>Mann</i> , Gustav, account of the ascent of Clarence Peak, Fernando Po	27	— <i>Thomæ</i> , <i>Linn.</i>	35
<i>Marsileaceæ</i>	197	<i>Neesia</i> , <i>Blume</i>	100
Masters, M. T., note on an unusual mode of germination in the Mango	24	<i>Nelumbiaceæ</i>	189
<i>Matisia</i> , <i>Humb. & Bonpl.</i>	100	<i>Nereocystis Lütkeana</i> , <i>Post. & Rupr.</i>	164
<i>Matisieæ</i>	100	<i>Neumayera</i> , <i>Reich.</i>	71
<i>Megaclinium</i> , <i>Lindl.</i>	128	<i>Notiophrys</i> , <i>Lindl.</i>	138
— <i>oxypterum</i> , <i>Lindl.</i>	128	— <i>glandulosa</i> , <i>Lindl.</i>	138
— <i>purpuratum</i> , <i>Lindl.</i>	128	<i>Nyctagineæ</i>	193
<i>Melandrium</i> , <i>Roehl.</i>	65	<i>Nymphæaceæ</i>	183
<i>Melanospermeæ</i>	163	<i>Oak</i> , from Northern China, W. Carruthers on some species of	31
<i>Melhania</i> , <i>Forsk.</i>	112, 116	<i>Ochnaceæ</i>	8
<i>Meliaceæ</i>	186	<i>Ochroma</i> , <i>Sw.</i>	100
<i>Melica</i> , <i>Linn.</i>	42	<i>Odonthalia angustifolia</i> , <i>Suhr.</i>	168
— <i>altissima</i> , <i>Linn.</i>	42	<i>Odontostemma</i>	70
— <i>ciliata</i> , <i>Linn.</i>	42	<i>Olyra</i> , <i>Linn.</i>	51
— <i>cynosuroides</i> , <i>Linn.</i>	42	— <i>latifolia</i> , <i>Linn.</i>	51
— <i>Falx</i> , <i>Linn.</i>	42	<i>Olyreæ</i>	194
— <i>minuta</i> , <i>Linn.</i>	42	<i>Orchideæ</i>	21, 194
— <i>nutans</i> , <i>Linn.</i>	42	<i>Orchids</i> , West-African Tropical, Dr. Lindley on	123
— <i>papilionacea</i> , <i>Linn.</i>	42	<i>Orobancheæ</i>	192
<i>Melochia</i> , <i>Linn.</i>	112, 117	<i>Orygia</i> , <i>Forsk.</i>	75, 76
<i>Menispermaceæ</i>	5, 183	<i>Oryza</i> , <i>Linn.</i>	51
<i>Merckia</i>	70	— <i>sativa</i> , <i>Linn.</i>	51
<i>Microcladia borealis</i> , <i>P. & R.</i>	175	<i>Oryzææ</i>	194
— <i>Coulteri</i> , <i>Harv.</i>	175	<i>Oxalideæ</i>	8, 186
<i>Milium</i> , <i>Linn.</i>	40	<i>Oxalis corniculata</i> , <i>Linn.</i>	8
— <i>Capense</i> , <i>Linn.</i>	40	<i>Pachira</i> , <i>Aubl.</i>	100
— <i>confertum</i> , <i>Linn.</i>	40	<i>Palava</i> , <i>Cav.</i>	99, 101
— <i>effusum</i> , <i>Linn.</i>	40	<i>Paniceæ</i>	194
— <i>lendigerum</i> , <i>Linn.</i>	40	<i>Panicum</i> , <i>Linn.</i>	37
— <i>paradoxum</i> , <i>Linn.</i>	40		
— <i>punctatum</i> , <i>Linn.</i>	40		

	Page		Page
<i>Panicum alopecuroideum</i> , <i>Linn.</i>	37	Phalarideæ	195
— <i>Americanum</i> , <i>Linn.</i>	37	<i>Phalaris</i> , <i>Linn.</i>	36
— <i>arborescens</i> , <i>Linn.</i>	38	— <i>aquatica</i> , <i>Linn.</i>	36
— <i>brevifolium</i> , <i>Linn.</i>	38	— <i>arundinacea</i> , <i>Linn.</i>	36
— <i>brizoides</i> , <i>Linn.</i>	39	— <i>bulbosa</i> , <i>Linn.</i>	36
— <i>capillare</i> , <i>Linn.</i>	38	— <i>Canariensis</i> , <i>Linn.</i>	36
— <i>clandestinum</i> , <i>Linn.</i>	38	— <i>erucæformis</i> , <i>Linn.</i>	36
— <i>colonum</i> , <i>Linn.</i>	38	— <i>oryzoides</i> , <i>Linn.</i>	36
— <i>coloratum</i> , <i>Linn.</i>	39	— <i>paradoxa</i> , <i>Linn.</i>	36
— <i>compositum</i> , <i>Linn.</i>	37	— <i>phleoides</i> , <i>Linn.</i>	36
— <i>conglomeratum</i> , <i>Linn.</i>	39	— <i>tuberosa</i> , <i>Linn.</i>	36
— <i>Crus Corvi</i> , <i>Linn.</i>	38	— <i>zizanioides</i> , <i>Linn.</i>	36
— — <i>Galli</i> , <i>Linn.</i>	37	<i>Pharnaceum</i> , <i>Linn.</i>	75, 76
— <i>curvatum</i> , <i>Linn.</i>	39	<i>Pharus</i> , <i>Linn.</i>	52
— <i>Dactylon</i> , <i>Linn.</i>	38	— <i>latifolius</i> , <i>Linn.</i>	52
— <i>dichotomum</i> , <i>Linn.</i>	38	<i>Phleum</i> , <i>Linn.</i>	39
— <i>dimidiatum</i> , <i>Linn.</i>	37	— <i>alpinum</i> , <i>Linn.</i>	39
— <i>dissectum</i> , <i>Linn.</i>	37	— <i>arenarium</i> , <i>Linn.</i>	39
— <i>distachyon</i> , <i>Linn.</i>	39	— <i>nodosum</i> , <i>Linn.</i>	39
— <i>divaricatum</i> , <i>Linn.</i>	38	— <i>pratense</i> , <i>Linn.</i>	39
— <i>filiforme</i> , <i>Linn.</i>	37	— <i>schœnoides</i> , <i>Linn.</i>	39
— <i>glaucum</i> , <i>Linn.</i>	38	<i>Phyllospora Menziesii</i> , <i>Ag.</i>	164
— <i>grossarium</i> , <i>Linn.</i>	38	<i>Physodium</i> , <i>Presl.</i>	112
— <i>hirtellum</i> , <i>Linn.</i>	38	<i>Phytolaccaceæ</i>	60, 192
— <i>Hydaspicum</i> , <i>Edgew.</i>	207	<i>Pittosporeæ</i>	5
— <i>incurvum</i> , <i>Linn.</i>	39	<i>Pittosporum Mannii</i> , <i>H. f.</i>	5
— <i>Indicum</i> , <i>Linn.</i>	39	<i>Plagianthus</i> , <i>Forst.</i>	99, 101, 102
— <i>Italicum</i> , <i>Linn.</i>	37	<i>Plantagineæ</i>	19, 192
— <i>latifolium</i> , <i>Linn.</i>	38	<i>Plantago</i> (<i>Leptostachys</i>) <i>palmata</i> ,	
— <i>lineare</i> , <i>Linn.</i>	38	— <i>H. f.</i>	19
— <i>miliaceum</i> , <i>Linn.</i>	38	<i>Plectranthus</i> (<i>Coleoides</i>) <i>glandu-</i>	
— <i>musciparum</i> , <i>Linn.</i>	39	— <i>losus</i> , <i>H. f.</i>	17
— <i>oryzoides</i> , <i>Linn.</i>	39	— (<i>Indi</i>) <i>ramosissimus</i> , <i>H. f.</i>	17
— <i>patens</i> , <i>Linn.</i>	38	<i>Plinthine</i> , <i>Reich.</i>	71
— <i>polystachyum</i> , <i>Linn.</i>	37	<i>Plocamium coccineum</i> , <i>Lyngb.</i>	171
— <i>ramosum</i> , <i>Linn.</i>	39	<i>Plumbagineæ</i>	192
— <i>repens</i> , <i>Linn.</i>	38	<i>Poa</i> , <i>Linn.</i>	42
— <i>verticillatum</i> , <i>Linn.</i>	38	— <i>alpina</i> , <i>Linn.</i>	42
— <i>virgatum</i> , <i>Linn.</i>	38	— <i>amabilis</i> , <i>Linn.</i>	43
<i>Papaveraceæ</i>	183	— <i>angustifolia</i> , <i>Linn.</i>	42
<i>Pappophoreæ</i>	196	— <i>annua</i> , <i>Linn.</i>	42
<i>Paratropia Mannii</i> , <i>H. f.</i>	10	— <i>aquatica</i> , <i>Linn.</i>	42
<i>Parietaria Mauritanica</i> , <i>Wedd.</i>	20	— <i>bulbosa</i> , <i>Linn.</i>	43
<i>Paronychia</i> , <i>Juss.</i>	77	— <i>capillaris</i> , <i>Linn.</i>	43
<i>Paronychiaceæ</i>	60, 77	— <i>Chinensis</i> , <i>Linn.</i>	43
<i>Paspalum</i> , <i>Linn.</i>	36	— <i>ciliaris</i> , <i>Linn.</i>	43
— <i>dissectum</i> , <i>Linn.</i>	37	— <i>compressa</i> , <i>Linn.</i>	43
— <i>distichum</i> , <i>Linn.</i>	37	— <i>distans</i> , <i>Linn.</i>	43
— <i>paniculatum</i> , <i>Linn.</i>	37	— <i>Eragrostis</i> , <i>Linn.</i>	43
— <i>virgatum</i> , <i>Linn.</i>	37	— <i>flava</i> , <i>Linn.</i>	43
<i>Pavonia</i> , <i>Cav.</i>	99, 105	— <i>Malabarica</i> , <i>Linn.</i>	43
<i>Peddiea parviflora</i> , <i>H. f.</i>	20	— <i>nemoralis</i> , <i>Linn.</i>	43
<i>Pentacæna</i> , <i>Bartl.</i>	77	— <i>palustris</i> , <i>Linn.</i>	43
<i>Pentapetes</i> , <i>Linn.</i>	112, 116	— <i>pilosa</i> , <i>Linn.</i>	43
<i>Pentatropis spiralis</i> , <i>Dcne.</i>	204	— <i>rigida</i> , <i>Linn.</i>	43
<i>Penthea</i> , <i>Lindl.</i>	138	— <i>spicata</i> , <i>Linn.</i>	43
— <i>Pumilio</i> , <i>Lindl.</i>	138	— <i>tenella</i> , <i>Linn.</i>	43
<i>Petasostylis</i>	144	— <i>trivialis</i> , <i>Linn.</i>	42
<i>Petrocoptis</i> , <i>A. Braun</i>	65	— <i>vivipara</i> , <i>Linn.</i>	42
<i>Pettera</i> , <i>Reich.</i>	71	<i>Poææ</i>	196

	Page		Page
Pollichia, <i>Soland.</i>	77	Rottbœllia dimidiata, <i>Linn. f.</i>	55
Polpoda, <i>Presl</i>	77	— exaltata, <i>Linn. f.</i>	55
Polycarpæa, <i>Lam.</i>	73	— incurvata, <i>Linn. f.</i>	55
Polycarpeæ	72	Rubiaceæ	11, 189
Polygalaceæ	184	Rubus apetalus, <i>Poir.</i>	9
Polygonaceæ	193	Ruizia, <i>Cav.</i>	112
Polysiphonia atrorubescens, <i>Grev.</i>	168	Rulingia, <i>R. Br.</i>	113, 121
— Californica, <i>Harv.</i>	168	Rutaceæ	186
— dendroidea, <i>Mont.</i>	168	Sabulina	71
— senticulosa, <i>Harv.</i>	169	Saccharum, <i>Linn.</i>	36
— urceolata, <i>Grev.</i>	169	— Officinarum, <i>Linn.</i>	36
Polystachya?	22	— Ravennæ, <i>Linn.</i>	36
Polystachya, <i>Hooker</i>	129	— spicatum, <i>Linn.</i>	36
— alpina?, <i>Lindl.</i>	131	— spontaneum, <i>Linn.</i>	36
— bifida, <i>Lindl.</i>	129	Sagina	71
— elastica, <i>Lindl.</i>	131	— Abyssinica, <i>Hochst.</i>	6
— ensifolia, <i>Lindl.</i>	129	Salicariæ	188
— laxiflora, <i>Lindl.</i>	129	Salicineæ	194
— odorata, <i>Lindl.</i>	130	Salsolaceæ	192
— pyramidalis, <i>Lindl.</i>	130	Salvadoraccæ	192
— setifera, <i>Lindl.</i>	130	Sanicula Europæa, <i>Linn.</i>	9
— tessellata, <i>Lindl.</i>	130	Santalaceæ	19
Porphyra vulgaris, <i>Ag.</i>	176	Sapindaceæ	186
Portulaca, <i>Linn.</i>	74	Saponaria, <i>Linn.</i>	62, 63
Portulacaria, <i>Jacq.</i>	74	Sapotaceæ	190
Portulacææ	58, 74, 185	Sarotes, <i>Lindl.</i>	113, 122
Primulaceæ	190	Schizotechium, <i>Fenzl</i>	68
Prionitis lanceolata (var. filicina)	174	Schizymenia coccinea?, <i>Harv.</i>	174
— Lyallii, <i>Harv.</i>	173	— Dubyi, <i>J. Ag.</i>	174
Psammotrophe, <i>Eckl. & Zeyh.</i>	77	— Mertensiana, <i>P. & R.?</i>	174
Pteranthus, <i>Forsk.</i>	77	Schoenus? erraticus, <i>H. f.</i>	22
Pterospermum	112	Schübleria	142
Ptilota Californica, <i>Rupr.</i>	175	Scleranthus, <i>Linn.</i>	77
Pycnostachys Abyssinica, <i>Fresen.</i>	17	Sclerocephalus, <i>Boiss.</i>	77
Quararibea, <i>Aubl.</i>	100, 110	Scleronema, <i>Benth.</i>	100, 109
Quercus	32	Scrophularineæ	19, 191
— acutissima, <i>Carruth.</i>	33	Sebæa brachyphylla, <i>Griseb.</i>	16
— Maccormickii, <i>Carruth.</i>	32	Secale, <i>Linn.</i>	50
— Mongolica, <i>Fisch.</i>	32	— cereale, <i>Linn.</i>	50
— serrata, <i>Thunb.</i>	32	— Creticum, <i>Linn.</i>	50
—, sp.	32	— Orientale, <i>Linn.</i>	50
—, sp.	33	— villosum, <i>Linn.</i>	50
Ranunculaceæ	4, 183	Senecio Clarenceana, <i>H. f.</i>	14
Ranunculus pinnatus, <i>Poir.</i>	5	— Mannii, <i>H. f.</i>	14
Reevesia, <i>Lindl.</i>	111	Senra, <i>Cav.</i>	100
Reichertia, <i>Karst.</i>	142	Seringia, <i>Gay</i>	113, 122
Resedaceæ	184	Sida, <i>Linn.</i>	99, 103
Rhabdonia Coulteri, <i>Harv.</i>	170	Sidalcea, <i>A. Gray</i>	99
Rhamnaceæ	186	Sidææ	99
Rhodomela floccosa, <i>Ag.</i>	168	Siebera	69
— Larix, <i>Ag.</i>	168	Silene, <i>Linn.</i>	62, 63, 64
— Lyallii, <i>Harv.</i>	168	Sileneæ	61
Rhodospermeæ	168	Silvæa, <i>Phil.</i>	74
Rhodymenia corallina, <i>Bory</i>	171	Solanææ	18, 191
— palmata, <i>Grev.</i>	171	Solanum Indicum, <i>Linn.</i>	18
— palmetta, <i>Grev.</i>	171	Spergula, <i>Linn.</i>	72
— pertusa, <i>J. Ag.</i>	171	Spergularia, <i>Pers.</i>	72
Rosaceæ	9, 188	Sphæralcea, <i>A. de St. Hil.</i>	99, 104
Rottbœllia, <i>Linn. f.</i>	55	Sphærocoma, <i>T. Anders.</i>	73
— compressa, <i>Linn. f.</i>	55	Sphenocleaceæ	191
— corymbosa, <i>Linn. f.</i>	55	Spinifex, <i>Linn.</i>	52

	Page		Page
Spinifex squamosus, <i>Linn.</i>	52	Triticum Polonicum, <i>Linn.</i>	51
Spraguea, <i>Torr.</i>	74	— prostratum, <i>Linn.</i>	51
Stachys (Stachyotypus) aculeolata, <i>H. f.</i>	18	— repens, <i>Linn.</i>	51
Stellaria, <i>Linn.</i>	67	— Spelta, <i>Linn.</i>	51
Stephania hernandifolia, <i>Wall.</i>	5	— tenellum, <i>Linn.</i>	51
Sterculia, <i>Linn.</i>	111, 113	— turgidum, <i>Linn.</i>	51
Sterculiaceæ, G. Bentham on the,	97, 110	— unilaterale, <i>Linn.</i>	51
Sterculiæ	111	Trochetia, <i>DC.</i>	112, 115
Stichophyllum, <i>Philippi</i>	73	Tryphane, <i>Reich.</i>	71
Stipa, <i>Linn.</i>	47	Tunica, <i>Scop.</i>	62
— arguens, <i>Linn.</i>	47	Typhaceæ	194
— Aristella, <i>Linn.</i>	47	Uebelina, <i>Hochst.</i>	66
— avenacea, <i>Linn.</i>	47	Ulva fasciata, <i>Del.</i>	176
— capillata, <i>Linn.</i>	47	— latissima, <i>Linn.</i>	176
— juncea, <i>Linn.</i>	47	— Linzæ, <i>Link</i>	176
— membranacea, <i>Linn.</i>	47	— rigida, <i>Ag.</i>	176
— pennata, <i>Linn.</i>	47	Umbelliferæ	9, 189
— spicata, <i>Linn.</i>	47	Ungeria, <i>Endl.</i>	111
— Spinifex, <i>Linn.</i>	47	Uniola, <i>Linn.</i>	44
Stipaceæ	195	— bipinnata, <i>Linn.</i>	44
Striaria attenuata, <i>Grev.</i>	167	— mucronata, <i>Linn.</i>	44
Swertia Clarenceana	16	— paniculata, <i>Linn.</i>	44
Symbolanthus	144	— spicata, <i>Linn.</i>	44
Talinopsis, <i>A. Gray</i>	74	Urena, <i>Linn.</i>	99, 105
Talinum, <i>Adanson</i>	74	Ureneæ	99
Tamariscineæ	188	Urticaceæ	193
Tarrietia, <i>Blume</i>	111, 114	Urticæ	20
Telephium, <i>Linn.</i>	75, 76	Vanilla, <i>Plumier</i>	137
Tetradia, <i>R. Br.</i>	111	— Africana, <i>Lindl.</i>	137
Thalamifloræ	183	— grandifolia, <i>Lindl.</i>	138
Thalictrum rhynchocarpum, <i>Quart.</i>		Velezia, <i>Linn.</i>	62
— <i>Dill. & Rich.</i>	4	Verbenaceæ	192
Theobroma, <i>Linn.</i>	113	Vernonia Clarenceana, <i>H. f.</i>	11
Thesium (Euthesium) tenuissimum, <i>H. f.</i>	19	Veronica (Veronicastrum) Mannii, <i>H. f.</i>	19
Thespesia, <i>Corr.</i>	100	Viola Abyssinica, <i>Steud.</i>	5
Thomasia, <i>Gay</i>	113, 122	Violariæ	5
Thurberia, <i>A. Gray</i>	100	Viscaria, <i>Roehl.</i>	65
Thymeleæ	20	Wahlenbergia arguta, <i>H. f.</i>	15
Tiliaceæ	185	— polyclada, <i>H. f.</i>	15
Trianthema crystallina, <i>Edgew.</i>	203	Waltheria, <i>Linn.</i>	113
— Hydasypica, <i>Edgew.</i>	203	Wibelinia, <i>Hochst.</i>	62
— pentandra, <i>Linn.</i>	202	Wierzbekia, <i>Reich.</i>	7
Trifolium Simense, <i>Fresen.</i>	9	Wissadula, <i>Medik.</i>	99, 104
— subrotundum, <i>Steud. & Hochst.</i>	8	Zea, <i>Linn.</i>	51
Triplateia	69, 70	— Mays, <i>Linn.</i>	51
Tripsacum, <i>Linn.</i>	51	Zizania, <i>Linn.</i>	51
— dactyloides, <i>Linn.</i>	51	— aquatica, <i>Linn.</i>	51
Trisetum lachnanthum, <i>Hochst.</i>	23	— effusa	51
Triticum, <i>Linn.</i>	50	— palustris, <i>Linn.</i>	52
— æstivum, <i>Linn.</i>	50	Zizyphus Jujuba	201
— hybernum, <i>Linn.</i>	50	— Spina-Christi	200
— junceum, <i>Linn.</i>	51	— vulgaris	200
— maritimum, <i>Linn.</i>	51	Zonanthus, <i>Griseb.</i>	145
— monococcum, <i>Linn.</i>	51	— Cubensis, <i>Gr.</i>	145
		Zygophyllaceæ	186

THE END.

