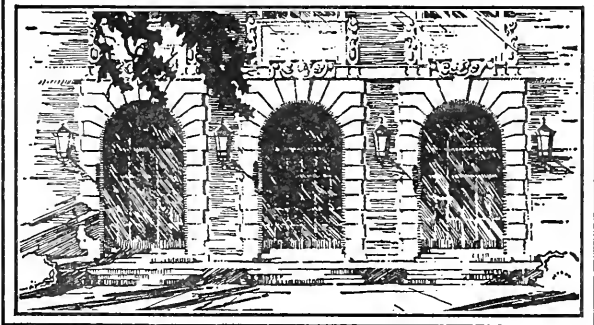


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LIST OF PAPERS.

| | page |
|---|---------------|
| ARNOTT, G. A. WALKER, LL.D., F.L.S., Regius Professor of Botany in the University of Glasgow. | |
| Note on <i>Samara lœta</i> , L. | 326 |
| BABINGTON, CHARLES CARDALE, Esq., M.A., F.L.S., F.G.S. &c. | |
| On <i>Cuscuta epilinum</i> and <i>halophyta</i> | 44 |
| A Description of a new genus of <i>Lineæ</i> | 90 |
| On <i>Spiranthes gemmipara</i> | 189 |
| BABINGTON, CHURCHILL, Esq. | |
| Remarks on British Lichens and Fungi, principally on Species or Varieties new to our Flora | 32 |
| BAUER, FRANCIS, Esq., F.R.S. & L.S. | |
| Observations on the Ergot..... | 52 |
| BENTHAM, GEORGE, Esq., F.L.S. | |
| On the <i>Heliamphora nutans</i> , a new Pitcher Plant from British Guiana..... | 53 |
| Account of two new genera of Plants, allied to <i>Olacineæ</i> | 85 |
| BERKELEY, Rev. M. J., M.A., F.L.S. | |
| On a Gall gathered in Cuba, by W. S. MacLeay, Esq., on the leaf of a plant belonging to the order <i>Ochnaceæ</i> | 33 |
| On an edible <i>Fungus</i> from Tierra del Fuego, and an allied Chi- lian species | 97 |
| On <i>Agaricus crinitus</i> , L., and some allied species | 230 |
| BIRD, GOLDING, A.M., M.D., F.R.S., F.L.S. &c. | |
| On the Siliceous Armour of <i>Equisetum hyemale</i> , L., with an ac- count of its hitherto undescribed Stomatic Apparatus | 290 |
| BLACKWALL, JOHN, Esq., F.L.S. | |
| Descriptions of newly-discovered Spiders | 41 |
| The Difference in the Number of Eyes with which Spiders are provided, proposed as the Basis of their distribution into Tribes; with the characters of a new Family and three new Genera of Spiders | 66 |
| A Catalogue of Spiders, either not previously recorded or little known as indigenous to Great Britain, with remarks on their Habits and Economy..... | 130, 131 |
| BOOTT, FRANCIS, M.D., F.L.S. &c. | |
| On <i>Carex saxatilis</i> , L., and an allied Species | 180 |
| Caricis species novæ vel minùs cognitæ | 254, 258, 284 |
| BROWN, ROBERT, Esq., D.C.L., V.P.L.S. &c. | |
| Some Account of an undescribed Fossil Fruit | 344 |
| BUNBURY, CHARLES JAMES FOX, Esq., F.L.S. | |
| Remarks on certain Plants of Brazil, with descriptions of some which appear to be new | 101, 108 |

B571

| | <i>page</i> |
|--|-------------|
| CANTOR, THEODORE, M.D., Civil Surgeon, Prince of Wales's Island. | |
| Observations on two Malayan species of <i>Semnopithecus</i> | 235 |
| Description of the Wild Dog of the Malayan Peninsula..... | 236 |
| CLARK, —, Esq. | |
| On the Sea Cocoa-nut of the Seychelles, <i>Lodoicea Seychellarum</i> , Comm. and Labill..... | 152, 153 |
| CLARK, BRACY, Esq., F.L.S., Corresp. Memb. of the French Instit. | |
| An Appendix or Supplement to a Treatise on the <i>Œstri</i> and <i>Cu-</i> <i>terebræ</i> of various Animals | 99, 100 |
| CLARKE, HYDE, Esq., F.L.S. | |
| Note on the Preservation of Specimens of Natural History | 96 |
| CLARKE, ROBERT, Esq., Senior Assistant Surgeon to the Colony of Sierra Leone. | |
| A Notice of the African Grain called Fundi or Fundungi | 155 |
| COOPER, DANIEL, Esq., A.L.S. | |
| On the Structure of the Nut known as Vegetable Ivory | 120 |
| COUCH, JONATHAN, Esq., F.L.S. | |
| A Letter on the occurrence of Wilson's Petrel (<i>Procellaria Wil-</i> <i>soni</i>) on the British coast | 2 |
| An Account of a Fish, nearly allied to the genus <i>Hemiramphus</i> , taken in Cornwall | 151 |
| COXE, JOHN REDMAN, M.D., Professor of Materia Medica in the University of Pennsylvania. | |
| Observations on some Fungi or Agarici, which by deliquescence form an inky fluid, drying into a bister-coloured mass, capable of being used as a water-colour for drawings, and of a very indestructible nature by means of common agencies | 19 |
| CURTIS, JOHN, Esq., F.L.S. | |
| Descriptions of the Nests of two Hymenopterous Insects inhabit- | |
| ing Brazil, and of the species by which they were constructed | 186 |
| Descriptions of the Insects collected by Capt. P. P. King, R.N., F.R.S., F.L.S. &c., in the Survey of the Straits of Magellan.. | 196 |
| On the Economy of the Order <i>Strepsiptera</i> | 212 |
| DON, DAVID, Esq., Libr. L.S., Professor of Botany in King's Col- | |
| lege, London. | |
| Description of a new genus of Plants belonging to the Natural Family <i>Bignoniaceæ</i> | 3 |
| Descriptions of the Indian species of <i>Iris</i> | 8 |
| An Account of the Indian Species of <i>Juncus</i> and <i>Luzula</i> | 9 |
| A Monograph of the genus <i>Disporum</i> | 44 |
| A Monograph of <i>Streptopus</i> , with the description of a new genus now first separated from it | 47 |
| On the Structure of the Tissues of <i>Cycadeæ</i> | 53 |
| On a peculiar kind of Organs existing in the Pitcher of <i>Nepen-</i> <i>thes distillatoria</i> | 91 |
| DOUBLEDAY, EDWARD, Esq., F.L.S. &c. | |
| Remarks on the genus <i>Argynnis</i> of the 'Encyclopédie Métho- | |
| dique,' especially in regard to its subdivision by means of cha- | |
| racters drawn from the neuration of the wings | 229, 233 |
| On the Pterology of the <i>Diurnal Lepidoptera</i> , especially upon that of some Genera of the <i>Heliconidæ</i> | 348 |

| | page |
|---|------------------------------|
| EDGEWORTH, M. PAKENHAM, Esq., F.L.S., Bengal Civil Service. | |
| Descriptions of some unpublished species of Plants from North-Western India | 252 |
| Description of a new genus of <i>Lentibulariæ</i> , with remarks on some Indian species of <i>Utricularia</i> | 351 |
| FALCONER, HUGH, M.D., F.R.S., F.L.S. &c., Superintendent of the Hon. E.I.C.'s Botanic Garden at Calcutta. | |
| Extracts from Letters addressed to Dr. Royle, F.R.S., F.L.S. &c., Prof. Mat. Med., King's College | 13 |
| Description of <i>Aucklandia</i> , a new genus of <i>Compositæ</i> , supposed to be the <i>Costus</i> of Dioscorides..... | 80 |
| On a reformed character of the genus <i>Cryptolepis</i> of Brown ... | 114 |
| On <i>Edgeworthia</i> , a new genus of Plants of the Order <i>Myrsinæ</i> | 129 |
| Description of the Asafœtida plant of Central Asia | 308 |
| Account of <i>Gamoplexis</i> , an undescribed genus of Orchideous Plants | 320 |
| Description of <i>Athalamia</i> , a new genus of <i>Marchantiæ</i> | 343 |
| FORBES, EDWARD, Esq., F.R.S., F.L.S. &c., Professor of Botany in King's College, London. | |
| On <i>Pectinura</i> , a new genus of <i>Ophiuridæ</i> , and on the species of <i>Ophiura</i> inhabiting the Eastern Mediterranean | 167, 174 |
| On the <i>Radiata</i> of the Eastern Mediterranean | 184 |
| On the <i>Medusa proboscidalis</i> of Forskähl | 222 |
| Notice of some Peloria varieties of <i>Viola canina</i> , L. | 382 |
| FORREST, THOMAS. | |
| A notice of the <i>Encephalartos horridus</i> , which flowered at Kinmel Park..... | 9 |
| FORSTER, THOMAS, M.B., F.L.S. &c. | |
| On the permanent varieties of <i>Papaver orientale</i> , L. | 158 |
| On the Migration of the Swallows | 296 |
| FOX, GEORGE TOWNSHEND, Esq., F.L.S. | |
| A notice of the Birds of Iceland, accompanied by specimens..... | 21 |
| GARDNER, D. P., M.D., of Hampden Sidney College, Virginia. | |
| On the Influence of the Dew-Point on the Temperature of Plants | 119, 120 |
| GARDNER, GEORGE, Esq., F.L.S. | |
| Description of <i>Peltophyllum</i> , a new genus of Plants allied to <i>Triuris</i> of Miers, with remarks on their Affinities | 176 |
| GIRAUD, HERBERT, M.D. | |
| Contributions to Vegetable Embryology, from Observations on the Origin and Development of the Embryo in <i>Tropæolum majus</i> | 124 |
| GRIFFITH, WILLIAM, Esq., F.L.S. | |
| On the Ovulum of <i>Santalum</i> , <i>Loranthus</i> , <i>Viscum</i> , &c. 162, 166, 168 | |
| On the Root Parasites referred by authors to <i>Rhizanthæ</i> and their Allies | 179, 180, 189, 190, 209, 216 |
| On the Development of the Ovulum in <i>Avicennia</i> | 223 |
| On the Ovulum of <i>Santalum</i> , <i>Osyris</i> , <i>Loranthus</i> , and <i>Viscum</i> ... | 223 |
| On the <i>Ambrosinia ciliata</i> of Roxburgh | 263 |
| On the Anatomy of <i>Eriocauloneæ</i> | 271 |
| On the Structure of the Ascidia and Stomata of <i>Dischidia Rafflesiana</i> , Wall | 279 |
| On the Seeds of <i>Careya</i> , Roxb. | 280 |

| | page |
|--|-------------------------|
| Papers on various subjects, bearing date in 1834 and 1835 | 281 |
| On the Impregnation of <i>Dischidia</i> | 324 |
| HAMILTON, FRANCIS BUCHANAN, M.D., F.R.S., F.L.S. &c. | |
| Commentary on the Eighth Book of the <i>Hortus Malabaricus</i> of Van Rheede | 134, 293, 310, 343, 355 |
| Commentary on the Ninth Book of Van Rheede's <i>Hortus Mala- baricus</i> | 361 |
| HARO, A., M.D., of Mentz. | |
| On <i>Secale cornutum</i> , the <i>Ergot</i> of Rye, and on a species of <i>Asplenium</i> , related to <i>A. Trichomanes</i> , L. | 159 |
| HARRIS, Major W. C. | |
| Account of the Trees producing Myrrh and Frankincense, as found in those parts of the coast of the Red Sea and Indian Ocean whence those Gums were obtained in the first dawn of Commerce | 181 |
| HASSALL, ARTHUR HILL, Esq., F.L.S. | |
| Observations on the Growth and Reproduction of <i>Enteromorpha intestinalis</i> | 152 |
| An Essay on the Distribution, Vitality, Structure, Modes of Growth and Reproduction, and Uses of the Freshwater <i>Con- fervæ</i> | 160, 163 |
| HEMING, G. C., M.D., F.L.S. &c. | |
| On the Muscles which move the Tail and Tail-coverts of the Peacock | 212 |
| HENDERSON, Mr. JOSEPH. | |
| On the reproductive Organs of <i>Equisetum</i> | 74 |
| HENFREY, ARTHUR, Esq., F.L.S. | |
| Observations on the immediate causes of the Ascent of the Sap in Spring | 229 |
| HINCKS, Rev. W., F.L.S., F.R.S.E. &c. | |
| Descriptions of three Vegetable Monstrosities lately found at York | 46 |
| Descriptions of some Vegetable Monstrosities | 118 |
| On the causes of disjunctions of Vegetable Substance, especially those which are horizontal | 273 |
| HOGG, JOHN, Esq., M.A., F.R.S., F.L.S. &c. | |
| Additional observations on the <i>Spongilla fluviatilis</i> | 8 |
| Further Observations on the <i>Spongilla fluviatilis</i> , with some re- marks on the nature of the <i>Spongiæ Marinæ</i> | 36, 225 |
| Additional remarks on the <i>Spongilla fluviatilis</i> | 226 |
| D'HOMBRES FIRMAS, Baron. | |
| Notes on the Seals of Linnæus | 323 |
| HOOKE, JOSEPH DALTON, M.D., F.R.S., F.L.S. &c. | |
| An Enumeration of the Plants of the Galapagos Islands ... | 231, 238, 263, 276 |
| On the Vegetation of the Galapagos Archipelago, as compared with that of some other Tropical Islands and of the Continent of America | 312, 313 |
| HOPE, Rev. F. W., M.A., F.R.S. & L.S. | |
| Descriptions of some new Insects collected in Assam, by William Griffith, Esq., Assistant Surgeon in the Madras Medical Ser- vice | 42 |

| | <i>page</i> |
|---|-------------|
| Descriptions of some new Insects collected in Assam, by William Griffith, Esq., Assistant Surgeon in the Madras Medical Establishment..... | 77 |
| On some rare and beautiful Coleopterous Insects from Silhet, the major part belonging to the collection of Frederic Parry, Esq. of Cheltenham | 127, 157 |
| KIPPIST, RICHARD, Esq., Libr. L.S. | |
| On the existence of Spiral Cells in the Seeds of <i>Acanthaceæ</i> | 63 |
| On <i>Jansonia</i> , a new genus of <i>Leguminosæ</i> , from Western Australia | 330 |
| KÖLLIKER, ALBERT, Professor of Physiology and Comparative Anatomy in the University of Zurich. | |
| Some Observations upon the Structure of two new species of <i>Hectocotyle</i> parasitic upon <i>Tremoctopus violaceus</i> , Delle Chiaje, and <i>Argonauta Argo</i> , L., with an exposition of the hypothesis that these <i>Hectocotylæ</i> are the males of the <i>Cephalopoda</i> upon which they are found..... | 236, 237 |
| LANKESTER, EDWIN, M.D., F.R.S., F.L.S. &c. | |
| On a White Incrustation on Stones, from the bed of the river Annan | 81 |
| LHOTSKY, Dr. JOHN. | |
| An Account of a species of <i>Lepidosperma</i> , from Tasman's Peninsula, Van Diemen's Land... .. | 4 |
| Some Data towards a Botanical Geography of New Holland ... | 11 |
| A Biographical Sketch of Ferdinand Bauer, Natural History Painter to the Expedition under Capt. Flinders | 39 |
| LINDLEY, JOHN, Esq., Ph.D., F.R.S., F.L.S. &c., Professor of Botany in University College, London. | |
| A Note upon the Anatomy of the Roots of <i>Ophrydeæ</i> | 10 |
| MACONOCHE, Capt. ALEXANDER, R.N., late Lieutenant-Governor of Norfolk Island. | |
| Some Notes on the Natural History of Norfolk Island | 228 |
| MAIN, JAMES, A.L.S. | |
| Remarks on Vegetable Physiology | 225 |
| MICHELOTTI, Signor GIOVANNI. | |
| Observations on some new or little-known species of <i>Polyparia</i> , found in the supercretaceous strata of Italy | 95 |
| MIERS, JOHN, Esq., F.R.S., F.L.S. &c. | |
| On some new Brazilian Plants allied to the Natural Order <i>Burmanniaceæ</i> | 60 |
| Additional Observations on some Plants allied to the Natural Order <i>Burmanniaceæ</i> | 66 |
| Description of a new genus of Plants from Brazil | 96 |
| On a new genus of Plants from Chili | 122 |
| On a new genus of Plants of the family <i>Burmanniaceæ</i> | 328 |
| On the genus <i>Atamisquea</i> | 355 |
| NEES VON ESENBECK, C. G., F.M.L.S., President of the Imperial Leopoldino-Caroline Academy Naturæ Curiosorum. | |
| A Descriptive Catalogue of the <i>Gramineæ</i> and <i>Cyperaceæ</i> contained in the Indian Herbarium of Dr. Royle | 92 |
| NEWPORT, GEORGE, Esq., F.R.S., F.L.S. &c. | |
| Monograph on the Class <i>Myriapoda</i> , Order <i>Chilopoda</i> , with observations on the general arrangement of the <i>Articulata</i> | 190, 191 |

| | <i>page</i> |
|--|-------------|
| Additions and Corrections to his Monograph of the <i>Myriapoda</i> | |
| <i>Chilopoda</i> | 231 |
| On the Natural History, Development, and Anatomy of the Oil Beetle, <i>Meloë</i> , more especially <i>Meloë cicatricosus</i> , Leach..... | 268 |
| On the Aqueous Vapour, and on the dark colour of the Wax, in Bee-hives..... | 288 |
| Note on the Generation of <i>Aphides</i> | 292 |
| On the Natural History, Anatomy and Development of <i>Meloë</i> (Second Memoir) | 317 |
| Note on <i>Cryptophagus cellaris</i> , Payk..... | 327 |
| On the Natural History, Anatomy and Development of <i>Meloë</i> (Third Memoir, the Anatomy) | 346, 368 |
| On the Formation and Use of the Air-Sacs and Dilated Tracheæ in Insects | 353 |
| On the Anatomy and affinities of <i>Pteronarcys regalis</i> , Newm. | 370, 387 |
| ORD, GEORGE, Esq., F.L.S. | |
| Notes on the Habits of the Box-Tortoise of the United States of America, the <i>Cistuda Carolina</i> of Gray | 116 |
| OWEN, RICHARD, Esq., F.R.S., F.L.S. &c. | |
| On a new Species of the genus <i>Lepidosiren</i> of Fitzinger and Natterer | 27 |
| PLANCHON, J. E., Docteur-ès-Sciences. | |
| On <i>Meliantheæ</i> , a new natural order of Plants | 361 |
| QUEKETT, EDWIN JOHN, Esq., F.L.S. | |
| Observations on the Anatomical and Physiological Nature of <i>Ergot</i> in certain Grasses | 4 |
| Observations on a certain Crystalline Matter found on the recently cut surfaces of the Wood of the Red Cedar | 58 |
| Some further Observations on the Nature of the <i>Ergot</i> of Grasses | 160 |
| Remarks on the Examination of some Fossil Woods which tend to elucidate the structure of certain tissues in the recent Plant | 232 |
| On the Development of Starch and Chlorophylle | 293 |
| RALPH, THOMAS SHEARMAN, Esq., A.L.S. &c. | |
| On the Axial and Ab-axial arrangement of Carpels | 284 |
| On the Structure of <i>Viola</i> , in connection with its Impregnation | 297 |
| REEVE, LOVELL, Esq., A.L.S. &c. | |
| On the calcifying functions of the Cowry and the Olive, two genera of Pectinibranchiate Mollusks | 307 |
| On the Structure and Comparative Physiology of <i>Chiton</i> and <i>Chitonellus</i> | 322 |
| RUDGE, EDWARD, Esq., F.R.S., F.L.S. &c. | |
| A notice of <i>Cereus tetragonus</i> | 7 |
| SCHOMBURGK, Sir ROBERT H. | |
| Description of the <i>Curata</i> , a plant of the tribe of <i>Bambuseæ</i> , of the culm of which the Indians of Guiana prepare their Sarbacans or Blowpipes | 49 |
| SMITH, Mr. JOHN, A.L.S. of the Royal Botanic Garden, Kew. | |
| Observations on the cause of <i>Ergot</i> | 1 |
| A Notice of a Plant which produces perfect Seeds without any apparent action of Pollen on the Stigma | 41 |
| A Note on the Fern known as <i>Aspidium Baromez</i> | 58 |
| Arrangement and Definition of the Genera of Ferns, founded | |

| | <i>page</i> |
|---|-------------|
| upon their venation, with examples of the species, and observations on the affinities of each genus | 75 |
| SOLLY, EDWARD, Esq., jun., F.R.S., F.L.S. &c. On the Solid Vegetable Oils | 214 |
| SOWERBY, G. B., Esq., F.L.S. &c. Description of a new species of <i>Cowry</i> | 314 |
| SUTOR, GEORGE, Esq., F.L.S. &c. Notes on the Forest-trees of Australia | 177 |
| TAYLOR, WILLIAM, Esq., F.L.S. A Note on the Bokhara Clover | 77 |
| THWAITES, G. H. K., Esq. On the Structure and Movements of <i>Bacillaria paradoxa</i> , Gmel. On the early stages of the Development of <i>Lemanea fluviatilis</i> , Agardh..... | 310 360 |
| VALENTINE, WILLIAM, Esq., F.L.S. On the Structure and Development of the Reproductive organs of <i>Pilularia globulifera</i> | 20 |
| Supplementary Observations on the Development of the Theca, and on the Sexes of Mosses | 33 |
| WALKER, FRANCIS, Esq., F.L.S. &c. Notes on the Variations of Structure in the British species of <i>Eurytomidæ</i> | 233 |
| Characters of undescribed species of British <i>Chalcidites</i> | 261 |
| WESTWOOD, JOHN OBADIAH, Esq., F.L.S. &c. Descriptions of some new species of the Coleopterous genus <i>Cerapterus</i> | 75 |
| Observations on the genus <i>Derbe</i> of Fabricius | 82 |
| A Synopsis of the Coleopterous family <i>Paussidæ</i> , with descriptions of a new Genus and some new Species | 110 |
| A Description of an additional species of <i>Paussus</i> | 115 |
| Description of a new Indian species of <i>Paussus</i> | 133 |
| On the occurrence of the Potatoe Disease, independent of the Attacks of Insects | 345 |
| Descriptions of some new species of <i>Athyreus</i> , MacL., a genus of Lamellicorn Beetles | 358 |
| On the Australian species of the Coleopterous genus <i>Bolboce- ras</i> , Kirby | 365 |
| Descriptions of some new or imperfectly known Species of <i>Bol- boceras</i> | 384 |
| WHITE, ADAM, Esq., F.L.S. &c. Notes towards a Statistical Account of the Fauna of New Zea- land and the Auckland Islands, so far as regards Annulose Animals | 306 |
| WOODS, JOSEPH, Esq., F.L.S. &c. Attempt to arrange the <i>Carices</i> of Middle Europe | 209 |

SHORT COMMUNICATIONS.

| | <i>page</i> |
|---|-------------|
| ANSELL, JOHN, Esq. Notice of <i>Juncus diffusus</i> , Hoppe, gathered near Hoddesdon, Herts | 313 |
| BABINGTON, CHARLES CARDALE, Esq., F.L.S. &c. Notice of some Fir-cones taken from beneath about 10 feet of solid peat at Burrishoole, near Newport, co. Mayo | 89 |
| BACKHOUSE, JAMES, JUN., Esq. Notice of specimens of <i>Spergula stricta</i> , Swartz., and of <i>Equisetum Drummondii</i> , Hook., both collected in Teesdale, Yorkshire | 222 |
| BENNETT, JOHN JOSEPH, Esq., F.R.S., Sec.L.S. &c. Note on a new species of the genus <i>Arundinaria</i> of Michaux ... | 51 |
| BIDWELL, J. C., Esq. Notice of a new species of <i>Araucaria</i> from the neighbourhood of Moreton Bay, and of the germination of <i>Nuytsia floribunda</i> | 123 |
| BORRER, WILLIAM, Esq., F.R.S., F.L.S. &c. Notice of <i>Leersia oryzoides</i> , Swartz, gathered in Henfield Level, Sussex | 222 |
| BOSTOCK, JOHN ASHTON, Esq. Extract of a Letter to J. Bostock, Esq., M.D., F.L.S., on an extraordinary Flight of Locusts observed between Cawnpore and Agra | 183 |
| BROMFIELD, WILLIAM ARNOLD, M.D., F.L.S. Notice of a species of <i>Calamintha</i> from the Isle of Wight..... | 179 |
| BURNHAM, J., Esq. Extract of a Letter to H. Clarke, Esq., F.L.S. | 99 |
| CAMERON, Mr. RICHARD, A.L.S. Notice of a Fern, cultivated in the garden of the Birmingham Horticultural Society as the <i>Agnus Scythicus</i> , or Vegetable Lamb | 57 |
| CLARKE, JOSHUA, Esq. Notice of specimens of <i>Galium Vaillantii</i> , Dec., gathered near Saffron Walden | 222 |
| Notice of <i>Barkhausia setosa</i> , Dec., found near Saffron Walden... | 179 |
| COOPER, DANIEL, Esq., A.L.S. Notice of specimens of <i>Lastrea rigida</i> collected at Settle | 52 |
| CUMMING, Mr. WILLIAM. Notice of specimens of <i>Lagurus ovatus</i> collected near Saffron Walden | 49 |
| Notice of specimens of <i>Lagurus ovatus</i> , <i>Briza maxima</i> , and <i>Mentha crispa</i> , gathered near Saffron Walden | 81 |

| | page |
|---|------|
| FARRE, FREDERICK, M.D., F.L.S. &c. | |
| Notice of a singular gall on the leaves of a species of Oak from Mexico | 65 |
| FELKIN, WILLIAM, Esq., F.L.S. | |
| Notice of some specimens of Sea-Island Cotton grown in a cotton-mill in the centre of Manchester | 99 |
| FOX, GEORGE TOWNSHEND, Esq., F.L.S. | |
| Notice of a specimen of <i>Phrynosoma cornutum</i> from Texas | 57 |
| FRANCIS, GEORGE, Esq., F.L.S. | |
| Notice of <i>Lepurandra saccidora</i> , Graham | 73 |
| GARDNER, GEORGE, Esq., F.L.S. &c. | |
| Extract of a Letter to J. Miers, Esq., F.L.S. | 99 |
| GOULD, JOHN, Esq., F.R.S., F.L.S. &c. | |
| Notice of a nondescript Lizard from New Holland | 81 |
| GRIFFITH, WILLIAM, Esq., F.L.S. | |
| Extracts of Letters to R. H. Solly, Esq., F.L.S., on the Ovula of <i>Ephedra</i> and <i>Callipeltis</i> ; and on the parasitism of <i>Cuscuta</i> and <i>Orobanchæ</i> | 90 |
| Extract of a Letter to R. H. Solly, Esq., F.L.S., on the Ovulum of <i>Osyris</i> | 113 |
| Extract of a Letter to R. H. Solly, Esq., F.L.S., on the Ovula of <i>Santalum</i> and <i>Osyris</i> ; and on the Sporules of <i>Isoëtes</i> , <i>Azolla</i> , and <i>Anthoceros</i> | 121 |
| HANKEY, JOHN ALEXANDER, Esq., F.L.S. | |
| Notice of specimens of <i>Fritillaria Meleagris</i> gathered at Finchley, Middlesex | 134 |
| HASSALL, ARTHUR HILL, Esq., F.L.S. | |
| Notice of an Apple in which decay had been induced by inoculation of decayed matter | 160 |
| HINCKS, Rev. WILLIAM, F.L.S. | |
| Notice of a specimen believed to belong to <i>Neottia gemmipara</i> , Smith, from the collection of Dr. Wood of Cork..... | 162 |
| HOME, Sir EVERARD, Bart., Capt. R.N. | |
| Extract of a Letter to R. Brown, Esq., V.P.L.S., giving an Account of the Measurement of some of the largest of the New Zealand and Norfolk Island Pines..... | 321 |
| HOPE, Rev. FREDERIC WILLIAM, F.L.S. | |
| Notice of an extensive Collection of Engraved Portraits of Linnæus | 166 |
| HORE, Rev. WILLIAM STRONG, F.L.S. | |
| Notice of a remarkable variety of Duck | 46 |
| LIFF, WILLIAM TIFFIN, Esq., F.L.S. | |
| Notice of some larvæ believed to belong to <i>Musca canicularis</i> , contained in the Urate of Ammonia voided by a Boa Constrictor | 52 |
| JANSON, JOSEPH, Esq., F.L.S. | |
| Notice of specimens of <i>Neottia æstivalis</i> collected near Lyndhurst | 80 |
| Notice of some living flowering plants of the "hungry rice" of Sierra Leone, <i>Paspalum exile</i> , Kipp. | 167 |
| KIPPIST, RICHARD, Esq., Libr. L.S. &c. | |
| Note on <i>Crepis biennis</i> and <i>Barkhausia taraxacifolia</i> | 98 |

| | <i>page</i> |
|---|-------------|
| Description of the Fundi or Fundungi, a new species of graniferous <i>Paspalum</i> from the colony of Sierra Leone..... | 156 |
| Note on the characters and distribution of <i>Barkhausia setosa</i> , Dec. | 179 |
| LANKESTER, EDWIN, M.D., F.R.S., F.L.S. &c. | |
| Notice of an Agaric in which gills were abundantly developed on a portion of the surface of the pileus directly over the stipes... | 226 |
| Notice of a <i>Fucus</i> sold in London under the name of "Australian Moss," believed to agree with <i>Fucus spinosus</i> , L. | 267 |
| LAY, JOHN TRADESCANT, Esq. | |
| Notice of some specimens of the <i>Keih-seen-me</i> , a species of <i>Alga</i> related to <i>Nostoc</i> , and eaten as a delicacy among the Chinese | 180 |
| MANN, THOMAS WHITE, Esq., F.L.S. | |
| Notice of an instance of extraordinary vitality in a specimen of <i>Sedum Telephium</i> | 89 |
| NEWMAN, EDWARD, Esq., F.L.S. | |
| Notice of a species of <i>Trichomanes</i> lately found in the co. Kerry, and supposed to be distinct from <i>Tr. speciosum</i> | 179 |
| NEWPORT, GEORGE, Esq., F.R.S., F.L.S. &c. | |
| Notice of <i>Pteronarcys regalis</i> , Newm., a Neuropterous insect furnished with external branchiæ in its perfect state | 180 |
| NORTHUMBERLAND, His Grace The DUKE OF. | |
| Notice of the Fruit of <i>Chrysophyllum monopyrenum</i> , Sw., grown at Sion House..... | 99 |
| Notice of the Fruit of <i>Diospyros edulis</i> , grown at Sion House ... | 134 |
| OGILBY, WILLIAM, Esq., F.L.S. | |
| Notice of a new species of Clover (allied to <i>Trifolium resupinatum</i>) recently introduced from Cabul | 80 |
| RALPH, THOMAS SHEARMAN, Esq., A.L.S. | |
| Notice of a Collection of Indian Fruits and Seeds presented by... | 158 |
| RAUCH, FRANCIS, Esq. | |
| Notice of a Fruit of <i>Salisburia adiantifolia</i> , grown in the Imperial Garden at Vienna..... | 73 |
| READ, W. H. RUDSTON, Esq., F.L.S. | |
| Notice of a shell of <i>Spondylus varius</i> , Brod., beneath the enamel of which a quantity of water had been retained for several months..... | 134 |
| REEVE, LOVELL, Esq., F.L.S. | |
| Notice of a specimen in spirits of the Animal of <i>Panopæa Aldrovandi</i> | 160 |
| SOLLY, RICHARD HORSMAN, Esq., F.R.S., F.L.S. | |
| Notice of a male plant of <i>Encephalartos pungens</i> , which had flowered in the Royal Botanic Garden at Kew | 52 |
| Notice of some effects produced on specimens of Fossil Wood preserved in a Cedar-wood Cabinet | 128 |
| STOCKS, J. ELLERTON, Esq., M.D., F.L.S. | |
| Notes on the Vegetation of Scinde | 367 |
| TAYLOR, WILLIAM, Esq., F.L.S. | |
| Notice of the Oil of <i>Madia sativa</i> , grown near Ipswich..... | 77 |
| Notice of the seeds, oil and oil-cake of <i>Camelina sativa</i> , Crantz. | 162 |

| | |
|---|-----|
| WARD, NATHANIEL BAGSHAW, Esq., F.L.S. | |
| Notice of a specimen of the <i>Agnus Scythicus</i> , or Vegetable Lamb | 58 |
| Notice of a Plant of <i>Musa Cavendishii</i> brought from the Navigators' Island in one of Mr. Ward's cases | 157 |
| Notice of specimens exhibiting the extreme states of <i>Chondrus crispus</i> , Lyngbye, gathered at Linnmouth, N. Devon | 283 |
| Notice of specimens of <i>Uncaria procumbens</i> , Burch.; and of a portion of the stipes of a Fern, probably <i>Pteris esculenta</i> , Sol. | 293 |
| Notice of Italian Specimens of <i>Adiantum Capillus Veneris</i> , L., and <i>Asplenium Trichomanes</i> , L., one of the latter bearing on several of its pinnae sori, taking their origin from the upper as well as from the lower surface of the frond; also of a branch of a Scotch Fir hollowed by hornets | 317 |
| Notice of several Ferns collected in Ireland | 326 |
| WATSON, HEWETT COTTRELL, Esq., F.L.S. | |
| Notice of specimens of <i>Carum Bulbocastanum</i> gathered near Cherry Hinton, and of <i>Seseli Libanotis</i> gathered near Seaford | 51 |
| WESTCOTT, Mr. FREDERICK. | |
| Description of a Fern cultivated in the Garden of the Birmingham Horticultural Society as the <i>Agnus Scythicus</i> , or Vegetable Lamb | 58 |
| WESTWOOD, JOHN OBADIAH, Esq., F.L.S. | |
| Notice of various Insects from the Collection of Lieut.-Col. J. B. Hearsey | 131 |
| Notice of the Aërial processes of the roots of <i>Sonneratia acida</i> , L., sent by Mr. Templeton from Ceylon | 166 |
| Notice of some Estrideous Insects received from Professors Zetterstedt and Dahlbom | 179 |
| Notice of several instances of Insect Monstrosities | 346 |
| Notice of the Silk spun by the Caterpillars of the new Indian Silk Moth <i>Bombyx Huttoni</i> , Westw. | 357 |
| WOOD, Rev. WILLIAM, B.D., F.L.S. | |
| Notice of a remarkable variety of <i>Typha angustifolia</i> | 42 |
| WOODS, JOSEPH, Esq., F.L.S. &c. | |
| On <i>Crepis biennis</i> and <i>Barkhausia taraxacifolia</i> | 98 |
| WRIGHT, Hon. H. | |
| Notice of specimens of the inner bark of the Cinnamon-tree, peeled of extraordinary length | 151 |
| YARRELL, WILLIAM, Esq., F.L.S. | |
| Notice of an interwoven mass of filaments of <i>Conferva fluviatilis</i> , of extraordinary size | 65 |

OBITUARY NOTICES.

| | <i>page</i> | | <i>page</i> |
|---|-------------|--|-------------|
| ABRAHAM, James Hussey ... | 298 | Field, Barron | 298 |
| Allen, William | 202 | Finch, William, M.D. | 372 |
| Anderson, William..... | 331 | Forester, Forester Rich., M.D. | 203 |
| Ansley, John | 135 | Fox, George Townshend | 372 |
| Baily, Francis..... | 238 | Gilbert, Davies | 68 |
| Bartlet, John | 67 | Gimbernat, Charles de | 35 |
| Bauer, Francis | 101 | Gisborne, Rev. Thomas..... | 299 |
| Beatty, Sir Wm., Knt., M.D. . | 135 | Goodall, Rev. Joseph, D.D. ... | 70 |
| Bedford, John, Duke of | 67 | Goodenough, The Very Rev. Edmund, D.D. | 239 |
| Beetham, William | 67 | Goolden, Richard | 137 |
| Bell, Sir Charles, K.H..... | 135 | Graham, Robert, M.D. | 300 |
| Bell, Rev. Isaac | 135 | Grey, Sir Thomas, Kt., M.D. | 334 |
| Bevan, Thomas, M.D. | 332 | Griffith, William | 239 |
| Biggs, Arthur..... | 371 | Guillemard, John Lewis | 244 |
| Blumenbach, John Fred., M.D. | 72 | Hailstone, Rev. John, M.A. ... | 372 |
| Bostock, John, M.D..... | 333 | Harlan, Richard, M.D. | 246 |
| Bowman, John Eddowes | 135 | Harrison, William | 137 |
| Bree, Rev. Robert Francis..... | 145 | Hatchett, Charles | 334 |
| Bridgman, William | 334 | Hills, Robert | 244 |
| Brookes, Samuel | 34 | Holford, Charles | 34 |
| Butt, Rev. Thomas | 137 | Hollinshed, Lawrence Brock... | 34 |
| Carlisle, Sir Anthony, Knt. ... | 104 | Holme, Edward, M.D. | 373 |
| Chichester, The Bishop of ... | 105 | Hope, Thomas Charles, M.D. | 250 |
| Chinnock, Henry Singer | 298 | Hornemann, Jens Wilken..... | 145 |
| Christy, William, Jun. | 67 | Hoy, James Barlow | 204 |
| Churchill, Lord Chas. Spencer | 67 | Hull, John, M.D. | 34 |
| Churchill, Lord Henry John Spencer | 105 | Hunneman, John | 36 |
| Clarke, Edmund John, M.D. . | 137 | Hurlock, Joseph | 244 |
| Coles, George..... | 137 | Jacquin, Baron Joseph Francis | 73 |
| Cooper, Daniel | 173 | Jamison, Sir John, M.D. | 244 |
| Cordeaux, Charles, M.D. | 239 | Janson, Joseph | 301 |
| Cotton, Richard..... | 67 | Johnson, James Rawlins, M.D. | 137 |
| Cunningham, Allan | 67 | Keith, Rev. Patrick | 70 |
| Cuvier, Frédéric | 35 | Kendrick, James, M.D. | 376 |
| Dalton, Rev. James | 172 | Kent, William | 71 |
| Davy, Rev. Martin, D.D. | 34 | Knapp, John Leonard | 244 |
| DeCandolle, Augustin Pyramus | 142 | Knight, Henry Gally, M.P. ... | 301 |
| Delessert, Baron Benjamin ... | 339 | Knowlton, Thomas | 302 |
| Dietrichsen, Lionel | 334 | Lagasca, Don Mariano | 71 |
| Don, David..... | 145 | Lambert, Aylmer Bourke | 137 |
| Dreyer, Rev. Richard, LL.B. . | 34 | Lane, Charles | 139 |
| Dunston, John | 372 | Latham, John, M.D. | 172 |
| Dutrochet, Henri, M.D. | 341 | Latham, Richard | 302 |
| Ellis, John | 372 | Leigh, Richard | 139 |
| Farnham, John Lord..... | 34 | Locke, William Oliver, M.D. | 376 |

| | <i>page</i> | | <i>page</i> |
|--------------------------------|-------------|---------------------------------|-------------|
| Loddiges, George | 334 | St. Hilaire, Etienne Geoffroy . | 247 |
| Loudon, John Claudius..... | 204 | Samouelle, George..... | 304 |
| Lubbock, Sir John Wm., Bart. | 105 | Saye and Sele, Lord | 338 |
| Lush, Charles, M.D. | 302 | Sharpe, James | 72 |
| Lynn, James, M.D. | 172 | Sheppard, Rev. J. Revett, M.A. | 106 |
| Macartney, James, M.D. | 206 | Simmons, Richard, M.D. | 338 |
| Main, James | 303 | Sligo, the Marquis of | 245 |
| Marlborough, George, Duke of | 67 | Smirnov, John | 245 |
| Martin, Matthew | 35 | Solly, Samuel | 339 |
| Matthews, Alexander..... | 173 | Sowerby, Charles Edward..... | 149 |
| Maycock, James Dottin, M.D. | 72 | Stephenson, Simon | 207 |
| Menzies, Archibald | 139 | Sternberg, Gaspard Count ... | 35 |
| Mills, William | 72 | Stuart, Dauiel | 339 |
| Milne, George | 35 | Sutton, Charles, D.D. | 341 |
| Morgan, John..... | 376 | Taylor, Thomas, M.D. | 379 |
| Mountnorris, the Earl of | 245 | Trinius, Karl Bernhard von ... | 249 |
| Newman, Rev. Thos., M.A. ... | 172 | Valentia, Lord Viscount | 106 |
| Newton, Rev. Thos., M.A. ... | 172 | Vigors, Nicholas Aylward, | |
| Nixon, Rev. Robert, B.D..... | 35 | D.C.L. | 106 |
| Northumberland, Hugh Percy, | | Viney, Major-General | 107 |
| Duke of | 335 | Walsingham, Lord, Rev. Thos. | 72 |
| Nouaille, Peter | 303 | Wedgewood, John | 245 |
| Onley, Charles Saville | 207 | Weekes, Richard | 380 |
| Parkinson, John | 336 | Wheeler, Thomas | 380 |
| Pavon, Don José | 208 | Wickham, William Nicholas ... | 339 |
| Peete, William | 377 | Wilmot, Sir John Eardley, Bart. | 381 |
| Pennant, David | 141 | Wilmot, R. Montague, M.B.... | 107 |
| Penny, George | 36 | Wood, George William | 207 |
| Quekett, Edwin John | 378 | Wood, Rev. William, B.D. ... | 107 |
| Rackett, Rev. Thomas, M.A.... | 105 | Woods, Henry | 107 |
| Roddam, George, M.D. | 379 | Wright, Francis Boucher | 107 |
| Rokewode, John Gage | 172 | Young, William Weston | 36 |
| Rudge, Edward | 337 | Younge, William, M.D..... | 35 |
| St. Aubyn, Sir John, Bart. ... | 72 | | |

PROCEEDINGS
OF THE
LINNEAN SOCIETY OF LONDON.

November 6, 1838.

Edward Forster, Esq., V.P., in the Chair.

The Society assembled this evening for the Session.

The Vice President stated that the late Nathaniel John Winch, Esq., A.L.S., of Newcastle-upon-Tyne, had bequeathed to the Society his entire herbarium, consisting of upwards of 12,000 species of plants, and his library of Natural History.

Read, "Observations on the cause of Ergot." By Mr. John Smith, A.L.S., of the Royal Botanic Garden, Kew.

Mr. Smith, like many others, had supposed that the ergot of rye was an organized fungus, growing in the florets of the rye and other grasses, but in the early part of October his attention was particularly directed to the subject by observing several large drops of a brown-coloured fluid suspended from a spike of a species of *Elymus*, in which were several full-grown ergots, and others in a younger state. The fluid was viscid and had a saccharine flavour. On subjecting a portion of it to the microscope, it was found to be full of innumerable minute, oblong, transparent bodies, varying from the 3000th to the 7000th of an inch, and resembling the sporules of fungi, and slightly bent, having a somewhat indistinct spot at each end. On applying a drop of water to a full-grown ergot, multitudes of these bodies became disengaged from its surface, and issued from the cracks or longitudinal fissures which generally characterize the fully developed ergot. These bodies imparted to the water a milky appearance. He observed the same bodies on ergots of all ages and sizes, and on opening the unexpanded flowers of ergot-bearing spikes, they were met with in abundance on the different organs, especially on the anthers; for on cutting an anther and applying water, they

were seen to float out along with the pollen. They were also observed on the ovarium, and in little clusters on the hairs and feathery stigmata. These bodies are found to accompany the ergot through all its stages, and are present even before the fecundation of the ovarium, at least before the discharge of the pollen, and consequently before there is any appearance of an ergot; they therefore cannot be the sporules, but must be the cellules of the minute fungus itself. On examining an ergot, the surface before being moistened presents under the microscope the appearance of a thin whitish pruinose crust, which, on the application of moisture, speedily separates into myriads of the minute transparent cellules before mentioned. On viewing the ergot in the dry state under the microscope, the pruinose appearance of the crust will be found to arise from these bodies being united together longitudinally, forming slightly elevated spiculæ, but crowded underneath and forming a kind of crust. These cellules so united present the appearance of slender-jointed filaments, either simple or branched, in which state they occur likewise on the anthers. Mr. Smith regards these cellules as the articulations of a minute filamentous fungus which is developed in the early stage of the flower, and propagating itself by the separation of the joints and impregnating the soil or the perfect seeds of the grass, which on germination and subsequent development carry up some of the reproductive matter of the fungus, which again develops itself in the flower, in the manner that Mr. Francis Bauer has shown to take place in the propagation of the smut and grain-worms in wheat.

Read, "A Letter on the occurrence of Wilson's Petrel (*Procellaria Wilsoni*) on the British coast." By Jonathan Couch, Esq., F.L.S.

A single specimen of the bird was found in a field near Polperro in Cornwall, about the middle of August last, when the stormy petrel (*P. pelagica*) abounded on the coast. Mr. C. instituted a comparison between them, and the result was as follows:

Weight of the stormy petrel 4 drams, 35 grains; of Wilson's petrel 5 drams, 2 scruples.

| | | | |
|---|--------------------|-----------------|--------------------------|
| Length | 6 inches | | 7 inches. |
| Spread of wings | 14 $\frac{1}{4}$ — | | 16 $\frac{1}{2}$ — |
| Wings extended beyond the tail ... | $\frac{1}{2}$ — | | 1 $\frac{1}{2}$ — |
| With the legs extended, the toes } extend short of the tail..... } | 1 line. | Beyond the tail | $\frac{1}{2}$ in. 2 lin. |

The stormy petrel is feathered just to the basal joint; but in Wilson's petrel the feathers only approach within 4 lines of it. In the former the tarsus is in length 1 line short of an inch, in the latter 1 inch 4 lines, and equally slender with the former; and the

hinder toe is so minute that it might escape any but attentive examination. In the bill the markings are more strongly defined, with the terminal hook longer and sharper. The prominence of the forehead is less than in the more common species. Colour of the head black with a hoary tint, lighter on the throat. The back, belly, wings, and tail are ferruginous, lighter on the wing coverts; the rump white, and a little of the same at the vent. Tarsi and feet black, with a longitudinal stripe of sulphur-yellow, more of a golden at the borders or the web between each toe.

The stouter configuration of this species enabling it better to escape the violence of a storm may be ascribed perhaps as a reason why it is not more often found on our coasts.

On examining the stomach of a stormy petrel Mr. Couch found about half an inch of a common tallow candle, of a size so disproportionate to the bill and gullet of the bird, that it seems wonderful how it could have been able to swallow it.

November 20.

Edward Forster, Esq., V.P., in the Chair.

Read, "Description of a new Genus of Plants belonging to the Natural Family *Bignoniaceæ*." By D. Don, Esq., Libr. L.S., Prof. Bot. King's College.

The subject of this paper was collected by Capt. Sir James Edward Alexander, during a journey through the interior of Southern Africa to the western coast. The plant was discovered by that enterprising traveller in the open desert, called the Kei Kaap, in Great Namaqua Land, in 25° S. latitude and 17° E. longitude. It is a thorny bush, about six feet high, with small simple, hoary, wrinkled, serrated leaves and large white flowers. There can be no doubt that the plant belongs to the *Bignoniaceæ*, although in habit it bears a stronger resemblance to *Verbenaceæ*, especially to *Duranta* and *Gmelina*. In its spathaceous calyx and regular funnel-shaped corolla the genus comes near to *Spathodea*, but is abundantly distinguished from it by the cells of the anthers being parallel and connate from the middle upwards. Its regular funnel-shaped corolla, spathaceous calyx, equal stamina, and serrated leaves essentially distinguish it from Burchell's curious genus *Rhigozum*, with which it agrees in habit. On the specimen were two expanded flowers and a bud. The calyx in all three had six teeth, and both the expanded flowers and the bud had a six-cleft limb; one of these had seven stamens, and the

other, as well as the bud, six, so that this last may be regarded as the normal number.

The following are the name and characters of this new genus.

CATOPHRACTES. *Calyx* spathaceus, hinc fissus, inde 6-dentatus. *Corolla* infundibuliformis: *limbo* 6-lobo, patenti, æquali. *Stamina* 6, raro 7. subæqualia, exserta. *Antherarum loculi* paralleli, è medio sursùm con-nati. *Ovarium* abbreviatum, conicum, biloculare ?

Frutex (namaquensis) *erectus*, *spinus*. *Folia fasciculata*, *simplicia*, *serrata*. *Flores laterales*, *subsessiles*, *speciosi*, *albi*.

Sp. 1. *C. Alexandri*.

Read, "An Account of a species of *Lepidosperma*, from Tasman's Peninsula, Van Diemen's Land." By Dr. Lhotsky. Communicated by Prof. Don, Libr. L.S.

This species is nearly allied to the *Lepidosperma elatior* of Labillardière, and is remarkable for the great length of its leaves, varying from 10 to 15 and even 20 feet. A specimen exhibited to the meeting had the leaf upwards of 13 feet long. It was discovered by Dr. Lhotsky in Tasman's Peninsula, Van Diemen's Land, growing in a dense jungle, through which its long slender leaves contrive to penetrate. It is termed "Cutting Grass," and like the other species of this Cyperaceous genus is characterized by the sharp edges of its leaves, which inflict wounds on the unwary traveller who happens to pass the plant hastily.

December 4.

Edward Forster, Esq., V.P., in the Chair.

G. E. Dennes, Esq., Vine Street, Golden Square; R. G. Holland, Esq., Surgeon, Sheffield; and Henry Laxton, Esq., Parliament Street, were elected Fellows of the Society.

Read, "Observations on the Anatomical and Physiological Nature of Ergot in certain Grasses." By E. J. Queckett, Esq., F.L.S.

Having had the opportunity of examining the formation of the ergot in several grasses, the author has endeavoured to trace the cause and origin of this singular formation on them, and particularly on *Elymus sabulosus*.

It was found, that when a grain of the grass was to be replaced by an ergot, it presented before the period of expansion of the flower a singular mildewed appearance. This, when examined microscopically, was seen to consist of filaments, at whose base were myriads

of particles of exceedingly diminutive size, forming a complete coating to the young grain, so that no part of its body was visible through it.

From this state the increase of the young ergot, but not of the filaments and particles, was very rapid; for in a short time after, when the ergot began to appear between the paleæ of the flower, its violet black colour was then visible, on account of the mildewed appearance not keeping pace in development with the ergot*.

After the ergot begins to appear beyond the paleæ, it in a short time attains its full size, and loses almost entirely its mildewed covering, presenting now its perfect violet black surface, and measures in different specimens from half an inch to one inch and half.

If the ergot be examined carefully at this period, in such specimens as have not been subjected to injury or displacement on the plant, it will be found that at its base are the two scales which are observable in the same place in the healthy grain, and that it is articulated to the receptacle, and separates from it as readily as the grain when ripe does from the same spot, and at the apex of it is a small body, frequently hairy, on which can be observed the remains of the stigmas.

From the relations of the ergot to these parts, and compared with those of the healthy grain, it is found that it is placed between and upon the same organs as the grain, and there cannot be a doubt but that this singular body is not an independent fungus, but a grain diseased from causes presently to be mentioned.

When the particles before mentioned, which occur on the surface of the ergot, and which are also found in a viscid fluid that hangs about the paleæ of the infected grass, are examined by the microscope, their size is found to be $\frac{1}{40000}$ part of an inch in length, and $\frac{1}{60000}$ part of an inch in diameter in the generality of instances, and their number is countless, probably 20 millions on each ergot. When magnified from 500 to 800 times, it then can be observed that their interior contains several well-defined green dots or granules, two or three being the most common numbers.

If these particles, which are no doubt the cause of the ergot, as they are found on every ergotized grass and are the sporidia of a certain fungus, be kept moistened on any convenient surface, as between a plate of glass and talc, they soon commence germinating (if recent)

* The growth of the ergot is very rapid when compared with that of the grain. Philippiar, in his 'Traité Organographique et Physiologico-agricole sur l'Ergot, &c., dans les Céréales', observed some particular plants of rye, whilst passing by a certain corn-field, which had no appearance of ergot, but ten or twelve days after these same plants had full-sized ergots upon them.

in various ways; sometimes by emitting a tube or tubes containing green granules, similar to those in the interior of the sporidia, and which probably separate finally into as many perfect reproductive atoms; in other instances one sporidium gives off a minute process from its side, which goes on increasing and ultimately becomes like its parent, and then separates from it. Often several sporidia so generated, remain united to each other for a short time, forming a moniliform filament, composed frequently of seven or eight joints.

The next and last method is the most perfect when it is found that the sporidia have their cavity divided by a septum, which is formed by a green granule of the interior extending itself laterally; each half of each sporidium being again subdivided, and by endless repetitions of this process a radiated plant is produced, which, when arrived at a certain size and age, bears upon its branchlets sporidia similar to that one from which it was first produced.

From these observations, it is proved that the sporidia, found on the surface of the diseased grain, can germinate and ultimately develop the means of their reproduction, without forming any body analogous in shape or structure to an ergot, which fact is conclusive that the filaments and sporidia are no part of that body, because they are found to flourish unconnected with it, and even grow on many parts of the same grass, as seen in the anthers by Mr. Smith, of Kew Gardens, and observed by Mr. Queckett on the paleæ, glumes and rachis; therefore the ergot, Mr. Queckett conceives, originates by the grain of the respective grass becoming diseased, from the presence of a parasite, which occasions such alteration in its development as to cause it to assume the well-known form, and to possess also the singular properties manifested in that of rye.

If the ergot be sliced into thin transverse sections, and these examined with a very high magnifying power, it will be seen that numerous particles escape from them when they are placed in water. These have been taken by Philippiar for sporidia, from which circumstance he considered the ergot as the reproductive apparatus of a fungus; but such particles are only those of a fatty oil, which escape from the divided cells, and collect on the surface of the water, in which the sections are immersed, and differ from the sporidia of the exterior by floating on the surface, whilst the latter always subside to the bottom of the vessel containing the water. The application of heat to these supposed sporidia fuses them into irregular masses of different sizes; and ether or turpentine, if allowed to evaporate after being added to them, leaves similar appearances.

The internal structure of the ergot looks extremely irregular, there

being no equally formed cells, but a confused jumble, out of which can scarcely be traced the true cells, on account of their boundaries being exceedingly sinuous, which structure is very like the centre of the fungus produced during the germination of the sporidia, and appears to be occasioned by fungoid matter having grown in the interior of the grain.

From these observations, which have been followed up in many ergotized grasses, Mr. Queckett is inclined to believe that the ergot is a grain diseased by a particular parasitic fungus developing in or about it, whose sporidia find the young state of the grain a matrix suitable for their growth, and quickly run their race, not entirely depriving it of its vitality, but communicating to it such impressions, which pervert its regular growth, and likewise the healthy formation of its constituents, being at last composed of its diseased materials, which are mixed up with fungic matter, which has developed within it.

The fungus caused to germinate in the way described is quite invisible to the naked eye, seldom measuring beyond the one or two hundredth part of an inch; and from comparisons with British and foreign genera of Fungaceæ, it has not been found that it belongs satisfactorily to any as at present constituted; the author therefore proposes a new genus, with the title *Ergotætea*, to represent this minute fungus, which will belong to the sub-order *Coniomycetes* of Fries, and to its division *Mucedines*, very near to the genus *Sepe-donium*.

After repeated experiments with the sporidia of the ergot of rye, of *Elymus*, and other grasses, the author has always succeeded in making them germinate, and has not discovered such differences as would lead him to consider that the parasite in each case was not the same, therefore he has applied the term *abortans*, as the specific name of *Ergotætea*, to the plant found on the ergot of rye, and believes the parasites, on the other grasses which have been examined, to be of the same species.

December 18.

Edward Forster, Esq., V. P., in the Chair.

Read, "A notice of *Cereus tetragonus*," by Edward Rudge, Esq., F.R. & L.S.

This plant has blossomed during the three past years in Mr. Rudge's collection at Abbey Manor House near Evesham. The

flowers expand in the evening like those of *C. grandiflorus*, which they resemble, but are not above half the size. The number of the angles of the stem is variable. The species is an old inhabitant of our stoves, but has rarely flowered.

Read, "Descriptions of the Indian species of *Iris*," by D. Don, Esq., Libr. L.S., Prof. Bot. King's College.

The number of species of this beautiful genus belonging to the Indian Flora is five, three of which have not been previously described: one of the species is from Cashmere, another from Ludak, a country situated beyond the Himalaya, and the remaining three are natives of Nepal and Kamaon, and of the country to the westward.

The following are the characters of the undescribed species :

1. *I. kamaonensis* (Wall. Cat. n. 5052.), barbata; scapo brevissimo unifloro, tubo perianthii longissimo subfiliformi, sepalis interioribus bilobis longè unguiculatis, ovario turbinato 3-gono.
2. *I. longifolia* (Royle Ill. t. 91. f. 2.), imberbis; foliis margine scabris, scapo brevissimo unifloro, sepalis sublanceolatis integerrimis, tubo perianthii vix ullo, ovario elongato triquetro scapum adæquante, stigmatibus lobis integerrimis.
3. *I. Moorcroftiana* (Wall. Cat. n. 5051.), imberbis; scapo bifloro pedunculis brevioribus, spatheis glumaceis tubum perianthii superantibus, sepalis lanceolatis acutiusculis, ovario 6-sulcato.

Read, "Additional observations on the *Spongilla fluviatilis*." By John Hogg, Esq., M.A., F.L.S.

The author's views of the vegetable nature of the river sponge were given in a paper read before the Society on the 5th of June, 1838, a report of which was inserted in the August number of the 'Annals of Natural History.'

The present paper contains additional observations in confirmation of those views, derived from a more accurate examination of the seed-like bodies, which are found adhering in abundance to the walls of the cells or cavities of the sponge, and are also frequently free and endowed with the faculty of locomotion; and which have been regarded by some authors as the ova of the *Spongilla*, and by others as those of the *Plumatella*. Mr. Hogg has determined the identity of these bodies, having succeeded in raising young *Spongilla* from both kinds; and he has also ascertained that they are destitute of cilia, being merely studded with minute granular papillæ. The motions of the unattached bodies resemble those observed by Unger in the sporules of *Ectospora clavata*, and Mr. Hogg considers the currents to be due to the same causes, which affect the circulation of the fluids in the cells of vegetables.

January 15, 1839.

Edward Forster, Esq., V. P., in the Chair.

Major Thomas Best Jervis, E. I. C. Engineer Service ; Thomas Bruges Flower, Esq., Bath ; J. C. Hall, Esq., Kensington ; R. M. Lingwood, Esq., B.A., Uckfield, Sussex ; and F. J. White, M.D., Warminster, were elected Fellows of the Society.

Read, " A notice of the *Encephalartos horridus*, which flowered at Kinmel Park." By Mr. Thomas Forrest. Communicated by the Secretary.

This brief notice was accompanied by the male spadix, which had flowered at Kinmel Park, the seat of Lord Dinorben, and was sent for exhibition to the meeting by command of His Royal Highness the Duke of Sussex. The plant had been sent to Lord Dinorben from the Cape of Good Hope about six years ago by Lord John Spencer Churchill, Capt. R.N. The spadix was of unusual size, and bore a strong resemblance to a gigantic pine cone. The most remarkable peculiarity observable was, that several scales, less developed than the others, bore only a single unilateral mass of anthers, whilst in others the two masses were scarcely confluent.

Read, " An account of the Indian Species of *Juncus* and *Luzula*." By D. Don, Esq., Libr. L.S., Prof. Bot. King's College.

The species described in this paper are all from Northern India, and were mostly collected by Dr. Royle in the range of the Himalaya, included between the Ganges and Sutlej. Of the eight species described, seven belong to *Juncus*, and only one to *Luzula*. Three of the former genus are entirely new, two had been previously gathered by Dr. Wallich's collectors in Nepal, and of the two others, one (*J. bufonius*) is common throughout the northern hemisphere, and the other (*J. glaucus*) is abundant in northern and central Europe. The *Luzula* is *spicata*, which occurs on the mountains of the north of England, Scotland, and throughout Europe, reaching as high as 71° north latitude, and which is likewise found on the Caucasus and Altai mountains in northern Asia. The present variety is from Lippa in Kunawur, a country situated beyond the Himalaya, in about 31° 33' north latitude, being about 11° more to the south than any station previously recorded for *Luzula spicata*. The variety differs in its broader sepals, blunt capsule, with obovate valves, and in the seeds not being above half the size.

We subjoin the characters of the new species.

1. *J. leucanthus* (Royle), culmo bifolio tereti, foliis margine involutis filiformibus culmum subæquantibus, capitulo terminali solitario 6—10-floro, involucre 5-phyllo glumaceo floribus longiore, sepalis acutiusculis, antheris acutis filamentis duplò longioribus, ovario incluso, stigmatibus stylo ter brevioribus.

This species is nearly allied to *J. triglumis*.

2. *J. leucomelas* (Royle), culmo enodi filiformi aphylo, foliis subulatis canaliculatis, capitulo terminali 3—5-floro involucre 3-phyllo acuto brevioris, sepalis obtusis, antheris filamentorum ferè longitudine, capsulâ acuminatâ perianthio longiore.
3. *J. membranaceus* (Royle), culmo tereti subdiphylo, foliis subfiliformibus obtusis, capitulo terminali solitario 4—8-floro bracteâ communi membranaceâ brevioris, sepalis obtusis capsulâ acutâ longioribus, staminibus inclusis, antheris filamentis dilatatis ter brevioribus.
4. *J. concinnus* (Don. Prodr. Fl. Nepal, p. 44), culmo tereti subdiphylo, foliis planiusculis obtusis, capitulis 3—6-floris corymbosis, bracteâ communi elongatâ foliaceâ, sepalis acutis capsulâ acutâ longioribus, staminibus longè exsertis, antheris filamentis simplicibus 6-plò brevioribus.
5. *J. indicus*, triandrus; capitulis multifloris squarrosis trichotomè cymosis, sepalis lineari-lanceolatis apice mucronatis recurvis capsulæ muticæ longitudine, stigmatibus sessilibus.

February 5.

Edward Forster, Esq., V. P., in the Chair.

J. J. Adams Esq., Surgeon, Finsbury Square, was elected a Fellow of the Society.

Read, a paper entitled "A Note upon the Anatomy of the Roots of *Ophrydeæ*." By John Lindley, Ph. D., F.R. and L.S., Prof. Bot. University College.

The object of the author in this paper was to show that salep, the prepared roots of certain *Ophrydeæ*, is not a substance consisting principally of starch, as is the common opinion among writers of the present day, but is composed of a bassorine-like matter, organized in a peculiar manner.

After stating the opinions of recent authorities, the author gives the results of his own microscopical examination of the tissue of recent and prepared roots, by which it appears that the tubercles of *Ophrydeæ* universally contain large cartilaginous nodules of a mucic-

lignous substance, not coloured by iodine, and a small quantity of the grains of starch, lying in the usual manner in the parenchyma which surround the nodules, and readily susceptible to the usual action of iodine. The tubercles of many South-African *Ophrydeæ* present when dried the appearance of bags filled with small pebbles, as if the epidermis had contracted over hard bodies in the inside. If a fresh root of *Satyrium pallidum* be divided transversely the cause of this appearance is explained, for with its soft parenchyma are mixed tough nodules, clear as water, and often twenty times as large as the cells which surround them. These nodules are easily separable, are tough like horn, and on being sliced appear to be perfectly homogeneous. They are scarcely soluble in cold water; when boiled they become tumid and partially dissolve into a transparent jelly. If exposed to the air they rapidly dry and become brown. The aqueous solution of iodine has no sensible effect upon them in their natural state.

On charring slices of some salep procured at Covent Garden, a coarse preparation of wild *Ophrydeæ*, the author found that the nodules apparently homogeneous were composed of extremely minute transparent cells, filled, as he supposed, with a secretion of the same refractive power as themselves, and adhering naturally to each other firmly; the double walls of the cells and intercellular spaces being only made apparent by the charring process. The author explains the error of those who have considered salep to consist chiefly of starch, by allusion to the mode of its preparation. The tubercles are first parboiled and then dried, the effect of which is to dissolve what starch exists in the cells surrounding the nodules. The dissolved starch flows over the surface of the nodules, from which when dried it is undistinguishable, and consequently when iodine is applied to salep the mass appears to become iodide of starch. If the nodules, however, after this action of iodine, be removed, they are seen to retain their original vitreous lustre.

The author remarks that these nodules of *Ophrydeæ* are, as far as his observations extend, absent in the tubercles of the other tribes of *Orchidaceæ*.

Read, a paper entitled "Some Data towards a Botanical Geography of New Holland." By Dr. John Lhotsky, late of the Civil Service, Van Diemen's Land. Communicated by Prof. Don, Libr. L.S..

The author commences his paper with the observation, that it was the lot of Mr. Brown to become connected in an almost exclusive way with the Flora of New Holland, he having been the first to illus-

trate its vegetable riches in an extensive and philosophic manner. Notwithstanding the important discoveries since made, his remarks, and especially those upon the botanical geography of that country, (published nearly twenty years ago,) have been confirmed by subsequent observations. The great approximation towards the European Flora, in that part of the country first explored by the author, agrees perfectly with the following observation of Mr. Brown: "It appears that a much greater proportion of the peculiarities of the Australian Flora exist in this, which I have therefore called the *principal parallel* (between 33° and 35° S. latitude), and that many of them are nearly confined to it.*" The author proposes the following geographical division of the Flora of the south-eastern part of New Holland.

1st. *The coast vegetation.*—This class of vegetation clothes the almost moveable sand of the coast, and the rocks of sandstone of the coal formation, or skirts the ponds of salt or brackish water. *Epacris*, *Boronia*, *Lambertia*, *Astroloma*, *Xanthorrhæa*, *Hakea*, *Banksia*, &c. are the most characteristic genera, forming usually a dense shrubbery of stiff and harsh plants. Of trees, scarcely any but species of *Eucalyptus* are to be met with.

2nd. *Vegetation of the rocky gullies near the sea coast.*—Such localities are generally characterized by small creeks or springs of fresh-water, of which the localities of the former class are mostly devoid. Two palms, *Corypha australis* and *Seaforthia elegans*, and the wonder of Australian forests, *Doryanthes excelsa*, adorn these localities.

3rd. *The Argyle vegetation* characterizes those park-like spots, with their stately Eucalyptus trees growing at some distance from each other, with very little underwood, which have attracted the notice of travellers, from Tasman down to those of our times. The geological features of this region consist of various rocks, the sandstone of the coal formation excepted, which last never yields a good soil. The genera of this class of vegetation are various grasses, *Thlaspi*, *Cerastium*, *Thymus*, *Scandix*, *Hydrocotyle*, *Dianella*, *Exarrhena*, *Silene*, *Hypericum*, &c., many of them European forms, and soft juicy plants. Where this vegetation occurs are to be found some of the most advantageous parts of the colony for the purposes of grazing.

4th. *The Menero vegetation* comprehends the Flora of those extensive downs which extend on the east side of the Alps to the extent of more than a hundred miles, and which are capable of maintaining vast numbers of sheep and other cattle. These downs present a dif-

* General remarks, geographical and systematical, on the Botany of Terra Australis, p. 586.

ferent aspect in different seasons, being in some covered with the most luxuriant herbage, which at other times is parched and dried up. Many genera of the preceding class occur in these localities, besides *Lythrum*, *Epilobium*, *Potentilla*, *Leuzea*, *Rumex*, and other European genera. The author regrets that the season was too far advanced to examine the *Gramineæ* and *Cyperaceæ*, which abound in this region.

5th. *Alpine vegetation*.—This was traced by the author to the summit of Mount William the Fourth.* These mountains being very extensive, will yield a great harvest to future travellers. The few plants collected by the author in this first investigation were two species of *Gentiana*, *Mniarum*, *Sphagnum*, *Dracophyllum*, *Azeroe*, *Coprosma*, *Podolepis*, some of the latter genus being three feet high.

February 19.

The Lord Bishop of Norwich, President, in the Chair.

Mr. George Dickie, of Aberdeen, was elected an Associate of the Society.

Read, “Extracts from Letters addressed to Dr. Royle, V.P.R. & F.L.S., Prof. Mat. Med., King’s College.” By Dr. Falconer, Superintendent of the Hon. E. I. C.’s Garden, Saharnpore.

Under date of January 24, 1837, from Saharnpore, Dr. Falconer gives a general report of the state of the garden.

“The *Bixa Orellana*,” he remarks, “now flowers and fruits freely. The umbelliferous flowered *Panax*, near the cinnamon tree, is now a large and lofty tree, and there are numbers of it all over the garden. The Bombay Mangoes and Leechees are abundant with us. The medicinal garden still gives the annual supply of *Hyoscyamus*, and the Canal nursery turns out about 2000 teaks. The Otaheite sugar cane, brought up by Colvin, is likely soon to spread all over the district; it has succeeded famously here, and I have now in preparation about a couple of beegahs of ground outside the garden for it. I am also preparing for sowing about twenty beegahs with upland Georgia cotton seed, which will undoubtedly be most success-

* According to a recent calculation, made from the degree of temperature at which water boiled on the top of this mountain (viz. 196°), it possesses an absolute height of 8000 feet, being by far the highest point reached hitherto by any traveller in Australia.

ful; it ripens before the Bourbon cotton comes into flower. This last season I got a few pods of Egyptian cotton, of the garden growth; the seed only reached me on the 15th of July, six weeks at the least too late, and it did not all ripen before the frosts, but what did ripen was long, fine, and strong in the staple, and the pods large. I expect to have a better account of it at the end of this season. I have also some Peruvian seed to experiment on.

“The herbarium has been largely added to. The family of all others that has yielded most additions perhaps is the *Orchideæ*. There are upwards of thirty epiphytous species growing on the trees in the garden, and many more in the herbarium; some of them are most interesting additions: one of them is a triandrous *Dendrobium*, *D. normale*, Fal. The three anthers are not the only singularity about it. The flower is perfectly regular; the three sepals being exactly equal, as are also the three petals, which, although of the same length, are twice as broad as the sepals. The column is also symmetrical, and as there is no labellum, it is difficult when the flower is removed from the axis to find out which of the petals represents the lip. Further, and what is most interesting of all, it clearly shows what is the normal position of the supplementary anthers in the family. Lindley makes them alternate with the lateral petals; while Brown, from the structure of *Apostasia* and *Cypripedium*, states that they alternate with the lateral sepals, and belong to a different whorl from the fertile anther. In my plant it is most distinctly evident, both by a decurrent ridge on each filament and by transverse sections of the column at all heights down to its base, that the supplementary anthers have the same relative position as the usual fertile one, and in harmony with Lindley’s formula. Further, I have another variety of the species, in which the column is sliced off in front as is usual in the genus, and then the labellar petal is invariably developed into a spurred lip, so that it would appear that in the family the irregularity of the lip is a state of anamorphosis consequent on the imperfect development of the column, or *vice versa*; in fact, that the deficiency of the one is abstracted to make up the excess of the other. Next I discovered another genus of the tribe *Gastrodiæ*, with a monophyllous perianth, the segments, sepals and petals being united for two-thirds of their length into a tube. I found it on Dhunoultee, and have called it *Gamoplexis*; it has the habit and look of an *Orobanche*. I have found also a magnificent Malaxideous genus, standing, when in flower, 9 feet. You never saw a more superb affair, with rich yellow flowers like the *Cyrtopera*. I have called it *Thysanochilus*. The seed-vessel

has no ribs, and in one flower of it I found a plurality of stamens. I have several other new genera, which it would tire you to describe. Talking of Dhunoultee, I found Wallich's *Fraxinus floribunda* growing on the ridge half-way between it and Landour, close to the road. You remember the description you give of the irregularity of the *Paris polyphylla* in Wallich's *Plantæ Asiaticæ*,—I found the *Podophyllum Emodi* growing intermixed with it, and strange to say, as if bewitched with the same turn for vagaries, with every number of stamens from 6 to 10, and in almost every flower one filament bearing two anthers, and that filament invariably the one opposite the petiole of the flower-bearing leaf. In one flower I found the following irregularities: 6 petals, 10 anthers, 7 filaments, or stamens if you like; on one filament 3 anthers, on another 2, and the remaining 5 regular. Singular that it and the *Paris* should grow together and both so irregular."

Under date of January 26, 1838, from Cashmere, whither he had proceeded on a Botanic mission in connexion with Sir Alex. Burnes's Expedition, Dr. F. says, "I am now wintering in Cashmere, with the prospect before me of pushing across through Little Thibet towards the Kuenlun Mountains when the snow clears. I started from Loodiana, where, by the by, I got the *Butomus umbellatus* in flower and fruit, new, I believe, to the plains of India; and after a few days at Lahore, I marched on through the Punjab to Attock in the month of July; no rains and fearful heat in the sandy plains I went along. From the want of rain and my route being through an open plain I did not glean much in my march. The Flora is exactly that of the neighbourhood of Delhi; *Peganum Harmala* everywhere, with *Capparidææ*, *Crotolaria Bushia*, *Calotropis Hamiltonii*, *Alhagi Maurorum*, *Tamarix*, *Acacia modesta*, &c. &c. Near Lahore I got what I believe to be a new Asclepiadeous genus exactly intermediate between *Calotropis* and *Paratropis*, with the angular and saccate sinued corolla, membrane lipped anthers and corona of the former, but the coronal leaflets cleft and the pollen masses oval and ventricose as in the latter, with other peculiar characters besides. It is a low, twining, small, fleshy, lance-leaved under-shrub. I have called it provisionally *Eutropis*. It is in great abundance in the Punjab. I met with the Dhak (*Butea frondosa*) as far as the western bank of the Jhelum. The Flora begins to change at Rawul Pindee, which is elevated and continuous so on to the plain of Chuch, along the banks of the Attock. Here I first came on the famous Zuetoon, the wild olive, *Olea* — ? and further on, at Hussan Abdal, I found Himalayan *Rubi* and a Cashmeer *Dianthus*, white flowered and new

to you. Near Attock I joined the party, having marched hitherto alone. We halted at Attock, the dry arid hills of which have a peculiar vegetation. We crossed the noble Indus at Attock; a fearful ferry, in the rains the river running eight knots an hour. The lower part of the plain of Peshawur, where we now were, is sandy, and has exactly the Flora of the arid tracts of the Punjab; *Salsolas*, *Chenopodeæ*, *Alhagi*, *Calotropis*, *Peganum*, *Tamarix*, &c. But when we got to Peshawur, so much do the seasons differ that peaches were coming into fruit the 15th of August, and the Kurreel (*Caparis aphylla*) out of flower only lately. From Peshawur I made an excursion to Cohaut, and from thence to the Salt Hills and the valley of Rungush. In the Salt Hills I got a Stapeliaceous Asclepiad, unfortunately neither in flower nor fruit, very probably one of Wight's *Carallumas* or *Boucerosias*. Also the *Cassia obovata*, the Egyptian senna in flower. I had previously got the same plant from near Delhi, no doubt about the species; certainly not the *obtusata* of Roxb.; the legumes always crested over the bulge of the seeds. I got numerous other plants. From Peshawur Burnes started for Cabul, and Mackeson and I for Cashmeer. From Attock, Mackeson went by the straight military road, as he was on a military survey, while I made an attempt to run up the Indus into the hills. I got on three marches and was forcibly stopped at Durbund (look at Burnes's map) and threatened with rather rough usage. I then turned across the hills and rejoined my companion in the noble valley of Huzara. The vegetation along the banks of the Indus from Attock to Durbund surprised me much. It is quite that of the characteristic forms of the Deyra Dhoon, and taking difference of latitude and altitude into account, with the great distance westward, this might not have been looked for: *Grislea tomentosa*, *Rottlera tinctoria*, *Hastingia coccinea*, *Acacia Catechu*, *Holostemma*, &c. On the banks of the Indus, in the valley leading up to Cashmeer from Huzara, I found the *Dodonæa Burmanniana*. You remark in your notice of the *Sapindaceæ* its absence from the Bengal and Hindoostan region. Its occurrence with a leap further north is remarkable. From Huzara we marched on by the Paklee road to Mosufferabad. Near Drumbur I came on the *Hovenia dulcis*. At Mosufferabad I got on a high ridge, and followed it on to Cashmeer, where we arrived early in October. It was now too late in the season to exhaust the Flora of the valley and neighbourhood, so I made up my mind to winter here and make a fresh start in spring. It would take pages to contain what I have observed about the Flora here, late as I came. It has several anomalies; few if any oaks descend on the northern side of the Peerpunjal into the valley. I have

not seen one yet. I have selected oaks as a very characteristic type. The same holds with respect to the plants that are associated with the oaks, &c. about Mussourie. In the lake you see *Nelumbium* and *Euryale ferox*, growing along with *Menyanthes trifoliata*; and cotton, a poor sort, growing on the banks, while the sides of the bounding hills are skirted with pines. I got *Staphylea Emodi* growing along with *Ribes Grossularia* (your *Himalense* ?), while it grows as you know at Mussourie on low slopes near Budraj. The *Prangos pabularia* grows in the valley. I found it most abundant on Ahatoong, a low trap hill on the valley, but it is not so vigorous a plant as in its Thibetian habitat. I expect in the summer to get as far north as lat. 36° at the least on the Kuenlun or Kara Korun range, a most desirable tract to explore, as it will be clear beyond Himalayan vegetation, partly characteristic of that of central Asia. I have already seen enough to convince me from a trip to the Thibet frontier to near Durass, that the Flora ahead will bear a close resemblance in many general relations to that of the Altai Mountains shown by Ledebour and yourself."

" Deosir, Cashmeer, June 20, 1838.

"I have written to you twice from Cashmeer. I have been going leisurely all round the valley, and into all the subordinate valleys which radiate on all sides from the great one. I have made many acquisitions. Among *Ranunculaceæ* I have got species of *Hepatica*, *Ceratocephalus*, and *Callianthemum*, all of which I believe to be new, and making up the very blanks you notice in your 'Illustrations.' Of *Callianthemum*, I have no knowledge, besides your quotation, but my plant has leaves with umbelliferous habit, 8 white strap-shaped clawed petals, with the nectariferous pore high up on the claw, and a *pendulous* ovulum. It cannot therefore be a *Ranunculus*, nor your *R. pimpinelloides*. Further, I have got a new Ranunculaceous genus, new unless Jacquemont has got it, having the habit of *Trollius* in its leaves and mode of inflorescence, 8 herbaceous sepals, 24 strap-shaped petals, plane with no fovea at the claw, and solitary *transversely attached* ovula, being neither pendulous nor erect. It forms a transition from *Adonis* to the *Ranunculeæ*. This is another blank filled up in the desiderata so pointedly mentioned by you. I have called the genus *Chrysocyathus*. It grows intermixed with *Trollius*, 'inter nives deliquescentes,' and till I examined it I took it for a *Trollius*. I have got a new species of *Adoxa*, forming I believe the second of the genus, *A. inodora* (mihi), a larger plant than the *A. Moschatellina*, and with the lateral flower 12-androus, and

6 segments in the flowers. I have also a new *Epimedium*, a large handsome leaved herb, *E. hydaspidis* (mihi), and two species of *Alchemilla*. *Fritillaria imperialis*, the Crown Imperial of English gardens, grows wild in the lofty shady forests of Cashmeer. The Cashmerees regard it to be unlucky, and grow it only near musjids and over graves. *Fothergilla involucrata* (mihi), belonging to the *Hamamelideæ*, exists in vast abundance in Cashmeer, forming whole tracts of low jungle; —strange that it should not have been brought before either to you or to me. It occupies the place that the hazel (*Corylus Avellana*) does in England, and at a little distance does not look unlike it. Thus, *Hamamelideæ* are found at opposite ends of the Himalaya range, *Bucklandia* and *Sedgwickia* in Assam, and *Fothergilla* in Cashmeer, but none of the family have yet been met with in the intermediate tracts. *Prangos pabularia* I have found in vast abundance in several directions, but the Cashmerees do not know it for any useful purpose, except as a plant highly prized by Europeans. They sometimes use the roots to destroy worms, by steeping them in Dhaun fields as Calamus (*butch*) is used in Hindoostan. The *Umbellifera* have not come into fruit yet, so I do not know much of my new acquisitions, but I have got among others a species of *Turgenia*, a genus which I believe is new to the Himalayas. My brother wrote me that you were inquiring about Koot and Amomum. Koot is exported from Cashmeer: it is a plant of the natural family of *Compositæ*, which has not yet come into flower, but I shall let you know about it hereafter. Amomum, Humama, or Amamoon, is not known in Cashmeer nor to be had at the Pien sarees. I have got a magnificent species of *Ornithogallum*?, with a scape 7 feet high: the Cashmerees call it Prustereen, and prize it highly as a culinary vegetable. I have had *Dodonæa* brought to me from above Jummos in the heart of the hills, growing along the banks of the Chenab. I mentioned to you in a former letter some of the anomalies I had met with in the absence of forms common elsewhere; not an oak, nor *Andromeda*, *Rhododendron arboreum*, *Mahonia nepalensis*, &c., have I yet found, though so common in the hills elsewhere. I have got *Sparganium* (*carinatum*, mihi), *Butomus* and *Villarsia Nymphoides* from the jhils. A species of *Sagittaria* is used here as a Cashmeree Salep, the natives collecting the roots as in China. The *Coniferae* are, as to the eastward, 3 pines, 2 or 3 firs and Deodar, but I have not seen the *Cupressus torulosa*, the lofty cypress of the Mussourie hills."

March 5.

Edward Forster, Esq., V.P., in the Chair.

Read, "Observations on some Fungi or Agarici, which by deliquescence form an inky fluid, drying into a bister-coloured mass, capable of being used as a water-colour for drawings, and of a very indestructible nature by means of common agencies." By John Redman Coxe, M.D., formerly Professor of Materia Medica in the University of Pennsylvania. Communicated by the Secretary.

Dr. Coxe having gathered a Fungus and placed it on a sheet of white paper, leaving it until the next day, found several drops of an inky fluid, slowly trickling from the inner surface, which had assumed a black appearance; by placing the Fungus in a glass, the whole except the outer skin liquefied. The colour of the fluid was rather a deep bister than black, and being left in the glass, in a few hours it separated into a solid sediment, with a lighter coloured fluid swimming above. Having afterwards collected a considerable quantity of fluid from the same species, he obtained by drying an extract of a pretty deep black colour of both parts conjoined, which would otherwise have separated. This on trial formed an admirable bister-like water-colour, well adapted for drawing when mixed with a little gum.

Dr. Coxe used the "fresh inky fluid as ink, and from such fresh fluid the accompanying drawings were made;" but it was soon found that its change was too rapid to think of depending on it for such a purpose, he therefore was led to dry it as quickly as possible by spontaneous evaporation, and then to use it diluted with water. Having exposed various portions of writing thus made to the direct rays of the sun for several months with little change, he tried the effects of chlorine and euchlorine gas, muriatic acid, and ammoniacal gases: from these but a trifling change ensued, except from the muriatic acid gas, which destroyed very considerably the dark tint of the writings. He also placed some small and recent specimens of the Fungus in a solution of corrosive sublimate, which preserved them and prevented any deliquescence: the same effect was produced by alcohol.

The ink is fully formed and escapes in about three or four days. When received into a phial, in a short time the heavier and blacker matter was found to settle as a sediment; the lighter brownish amber-coloured fluid surmounts it, and may be poured off from it to dry them

separately. From a good sized specimen nearly half an ounce of fluid has been obtained.

The following chemical experiments among others were made :—

1. Two drachms of the fluid added to ζ 1 of hydrate gave a clear brown transparent solution, to which in separate glasses was added

2. *Nitrate of Silver* : no effect at first, but in a few minutes dark brown flocculi subsided, leaving a transparent fluid above.

3. *Muriate of Barytes* : no effect at first, finally a subsidence of dark brown flocculi.

4. *Acetate of Lead*. Immediate dark brown flocculi, leaving a clear liquid above.

5. *Carbonate of Potash*. Transparency destroyed ; a trifling brown deposit in a few hours.

6. *Alcohol*. No apparent change from it.

7. *Solution of Corrosive Sublimate*. An apparent diffusion of brownish hue, gradually subsiding in dirty brown flocculi.

8. *Dilute Muriatic Acid*. The same, but much smaller in amount.

10. *Lime Water*. Light brown flocculi in a few hours.

11. *Liquor Ammoniaë*. No effect.

12. *Succinate of Ammonia*. Deep brown deposit in a few hours.

13. *Prussiate of Potash*. No effect.

14. *Oxalate of Ammonia*. Clouds form and settle in a dirty brown sediment.

From these experiments Dr. Coxe is disposed to think that an excellent *India Ink* might be prepared for drawing ; perhaps its dried deposit mixed with oil might answer for engravings ; and as an ink, indestructible from any common agents, it might be well to try it in the filling up of bank notes and other papers of consequence, as he believes it cannot be extracted by any means without destroying the paper itself.

The Fungus described, and on which the above experiments were tried, is referred with some hesitation to *Agaricus ovatus*, Schæffer, 'Icones Fungorum,' fig. 7. *A. cylindricus*, fig. 8. *A. porcellaneus*, fig. 46. and 47. The drawings are named *Agaricus ovatus**.

* The drawings evidently represent *Agaricus fimetarius*, Linn. and Curtis ; *A. comatus*, Mull. and Berkeley ; *A. cylindricus*, Sowerby ; to which *A. cylindricus*, Schæff. f. 8. and *A. porcellaneus*, figs. 46 & 47. belong ; it is not so clear that *A. ovatus*, fig. 7. (the name adopted by Dr. Coxe) does. In the subgenus named by Berkeley *CORPINUS* every species is deliquescent. Curtis observes, under his *A. ovatus*, which is *A. atramentarius*, Bull. and Berk., that the seeds may be seen in the black liquor if magnified.

March 19.

Edward Forster, Esq., V. P., in the Chair.

Robert John Ashton, Esq., Brompton; Patrick Leigh Strachan, Esq., of the Civil Service, Sierra Leone; and Alfred White, Esq., Islington, were elected Fellows of the Society.

Read, "A Notice of the Birds of Iceland, accompanied by specimens." By George Townshend Fox, Esq., F.L.S.

It is perhaps not generally known that the Durham University has established a Museum as one of the necessary appendages of an academical institution; the subcurator of which, Mr. Wm. Proctor, requested and obtained permission to go out to Iceland in the summer of 1837 to procure a collection of the birds of that island. Three months were passed on the most northern part of Iceland, this locality being chosen by Mr. Proctor as one least visited by naturalists, and therefore the most likely to repay his labours by the number or rarity of the specimens to be obtained. Skins of fifty-two species of birds were brought home, besides skins of six Rein Deer, three species of Seals, two large Fishes (*Anarrhicas*), and a Porpoise.

Frederick Faber in his Ornithology of Iceland, published at Copenhagen in 1822, enumerates eighty-four species of birds; of which about twenty are land birds, and sixty water birds. Faber adopted the nomenclature of Linnæus, but an examination of the skins brought home by Mr. Proctor has led to the belief that several of Faber's birds are not identical with the Linnean species. The Iceland Falcon is considered by Mr. Hancock* as distinct from the whiter falcon of Greenland. The Iceland Grouse is correctly considered by Faber as peculiar to that island. The Bridled Guillemot, *Uria lacrymans*, Laphyl., is for various reasons believed to be a species distinct from the Common Guillemot, *Uria Troile*, Lath. *Clangula Barrovii* was found breeding on the ground in a nest formed of its own down, and placed among aquatic plants a little above high-water mark. Some rare eggs were also obtained, namely, those of the Iceland Falcon, Little Auk, Bridled Guillemot, and Slavonian Grebe.

Read also a paper, "On the Structure and Development of the Reproductive organs of *Pilularia globulifera*." In a letter to

* See Mr. Hancock's paper on this subject in the 'Annals of Natural History,' vol. ii. p. 241.

R. H. Solly, Esq., F.R.S. and L.S. By William Valentine, Esq., F.L.S.

The author observes, that the involucrem of *Pilularia globulifera* contains two kinds of bodies, which, however, occupy distinct sacs; one kind are round, very numerous, and minute, not larger than the 460th part of an inch; they are found principally in the upper part of the involucrem, and are about forty in each sac. The other kind are of an oblong pyriform shape, a little constricted near the middle, with a conical projection at one extremity, and are much less numerous, about sixty, and occur singly in each sac; they are about the 80th part of an inch broad, and have the power of germination, which the former kind do not appear to possess. Both kinds are loose in their sacs, and have an opaque, pure white, minutely granular, testaceous covering, and are imbedded in a kind of gelatin, which softens and expands by the action of water, but is not completely dissolved. The larger bodies, the undoubted sporules, after a very slight maceration in water, (less than a minute is sufficient,) are enveloped by a well-defined covering of gelatinous matter, which before the maceration existed in a concrete state. Further maceration does not appear to affect this gelatinous covering, as it remains unchanged long after germination, and gives to the sporule the appearance of having a very delicate transparent border, whose breadth is about the 4th part of the diameter of the sporule.

The sporule consists of three coats, the outer of which is white, opaque, somewhat brittle, more or less incomplete at the conical extremity, but much thickened about the upper third of the sporule, where it exhibits traces of cellularity. The middle coat is membranous, elastic, of a light yellowish brown colour, and perforated at the apex of the conical projection which is essentially formed by this coat, the outer coat being gradually lost upon its surface, or in some instances being scarcely continued on to it, in which case the sporule appears truncated, the middle membrane not having sufficient firmness of itself to support the conical form. This conical projection is more or less plicated, and in those instances in which the outer coat is very deficient the middle membrane exhibits lines radiating from the aperture. The third coat, or internal membrane, is similar in colour to the middle, differing from it however in being inelastic, and not being continued into the cone, but forming a short cavity, by passing directly across the base of the cone, at which point it is not in contact with either of the other membranes, and is marked by three lines, which radiate from the centre of the unsupported portion, and indicate a valvular structure to allow of the protrusion

of the growing matter in germination. The cavity of the sporule is occupied by a quantity of grumous fluid and particles, which are of various sizes, the larger ones being mostly of an ovoid shape, but altering by pressure.

I found many of these sporules in a germinating state, the majority having escaped from the involucre, but in several instances I found them considerably advanced in germination before the rupture of the involucre and whilst they were yet inclosed in their sacs. The first external sign of germination is either the appearance of four cells projecting through the apex of the conical projection or a general swelling of that part. By dissection, however, we can observe this process at an earlier period, and I find upon removing the conical projection that the first evidence of germination having commenced is an appearance of cellularity within the unsupported or valved portion of the internal membrane, which is transparent; and I now find for the first time a very delicate pellucid membrane lining the whole cavity of the sporule, and having the cells which give the appearance just mentioned either lying on its external surface or forming that portion of it which lies beneath the valves. From the appearances and impossibility of separating the cells from the membrane I am inclined to believe that the cavity formed by this membrane is completed by the cells, or, in other words, that the sac is partly membranous and partly cellular. It is possible that this last described membrane may exist before germination begins, notwithstanding the numerous unsuccessful dissections which I have made to discover it, the failure being owing to its extreme delicacy; but I am pretty well satisfied that it is a product of germination, because I have not the slightest difficulty in demonstrating it after that has commenced, nor is there the slightest trace of it in any stage of the development of the sporule. However this may be, it is quite certain that fresh cells are gradually formed on the external surface of the cellular part of the sac, and that the valves of the third membrane are very soon ruptured and gradually turned back by the growth and protrusion of this button-like cellular germ. The enlarging cellular mass then distends the conical projection, unfolding the plicæ of that body, and at length appears externally, with four of its cells projecting beyond the general mass and compressed into a quadrangular form, I fancy by the pressure of the apex of the cone, the aperture in which is quadrangular. These projecting cells soon harden and acquire a reddish brown hue, and in the advanced stage of germination appear like a brown quadrangular space, which I should have little hesitation in referring to the above cause

did I not find several similar spaces on the germinating sporules of *Isoetes lacustris*, which I could not refer to such an origin: it must be observed however that I have not seen the earlier stages of germination in *Isoetes*. Soon after the exposure of the entire germ, which is effected by the reflexion of the valves and conical membrane over the side of the sporule, where they lie quite concealed by the germ, little fibrillæ or rootlets begin to shoot from one side. They are simply articulated tubes or elongated cells applied end to end with frequently a bulbous extremity, and each is produced from one of the cells of the germ. They differ much in length in different sporules; in some they are not longer than the sporule, whilst in others they are three or four times that length, and, in common with the cells of the germ, contain granules which in these are colourless but in the germ green. The cluster-like appearance of the cells which form the germ, soon after the appearance of these fibrillæ begin to change, the cells becoming flatter and more intimately connected with each other. At the same time an internal change is taking place, for by a gradual arching or receding upwards of that part of the germ which closes the cavity of the sporule the germ becomes hollow, the hollow communicating with the cavity of the sporule, which is of course proportionably enlarged. The germ now gradually points in two places, which are by no means fixed, but occur in various situations according to the position of the sporule in relation to the light. The direction of the first leaf is generally in the direction of the axis of the sporule, or rather a little inclined, and that of the first root at right angles or lateral, but very soon changing to an opposite direction to that of the leaf. This would be the constant direction if the sporules were always left to themselves free from entanglements, on account of the peculiar structure of their outer coats; the spongy fibro-cellular texture of the superior third of which, causing that end to be the most buoyant in the water, exposes the superior surface of the germ to the direct action of the light; but as it cannot always happen that the sporules should be free, the direction of the leaf and root is sometimes quite the reverse, and at others both leaf and root are lateral, but proceeding from opposite sides of the germ. These two points gradually lengthen, and if dissected each will be found to consist of a closed sheath, containing in one instance the leaf, in the other the root in the form of a conical process like a finger in a glove. The young leaf, which is taper and its cells crowded with green granules, being in advance of the root, which is obtuse and destitute of green granules, bursts through the summit of its sheath when it has become rather longer

than the sporule, whilst the root, although more backward in its development, pierces its sheath before it is as long as the sporule. The sheaths are not distinct, but communicate with each other; and the only point of connexion between the sheath (there being in fact but one) and the germ is around its base close to the sporule, so that nearly the whole of the germ is inclosed in this sheath. Besides this sheath which embraces the upper part of the root, there is an exceedingly delicate expansion, which so closely embraces the extremity of the root like a cap, that it is only by a careful examination that it can be discovered. I am not aware that this has ever had any connexion with the sheath through which the root bursts, but, on the contrary, I believe it to be a distinct formation. After the leaf has grown many times the length of the sporule, or about 2 lines long, another leaf grows from the germ close to the first, to which it is in all respects similar, and then a bud begins to be developed from some indefinite part of the germ, but like the leaves and root from within the sheath, which is now frequently much lacerated. This bud is covered by a peculiar kind of jointed hairs, whose attachments are lateral, at a short distance from their bases, and they contain a few colourless granules. This bud sometimes appears after the first leaf, in which case there is no second primordial leaf formed, and is the rudimentary stem, the first growth from it being a leaf which exhibits, although in a small degree, the first evidence of gyration, and shortly after a root which is furnished with its own sheath. As I have not seen more advanced specimens, I am unable to describe the succeeding steps; but as, up to this point, my observations were made upon several hundred examples, I may safely affirm that the instances were sufficiently numerous for my purpose.

All the leaves after the primordial ones, or those which grow direct from the germ, are developed in a similar manner to ferns, and even the running stem partakes in a slight degree of the same gyrate evolution. The roots are all formed in sheaths, through the apices of which they ultimately burst; the sheath continuing to embrace the base of the root, whilst a distinct and far more delicate sheath closely embraces its point. Transverse sections of the stem, root, and leaves show them all to be hollow with the cavity divided longitudinally into separate channels. In the stem these longitudinal partitions are about fifteen or sixteen in number, and in the leaf and root they are about ten or twelve, which in the latter are arranged in pairs. These partitions radiate from a central column of enlarged cells which surround a bundle of minutely dotted ducts that may be unrolled spirally, and the channels between these partitions are fre-

quently divided by transverse partitions or diaphragms. The cells which form these partitions are curiously arranged—they are flattened on two opposite sides, and connected with each other by their narrow sides and extremities, but only at intervals, so that there are numerous holes formed which afford a free communication between all the channels. In the partitions of the root the intervening holes are so large in proportion to the breadth of the cells that these have the appearance of a string of beads. Another peculiarity of the root is, that, in addition to the diaphragms formed of this tissue, which are also found in the stem and leaf, a peculiar body is frequently met with occupying a similar position to the diaphragms. These bodies (for they are sometimes numerous) are each formed of one or more cylindrical cells coiled up in a gyrate manner. They grow from the angle formed by the partition and the cuticle, and are developed subsequent to the other tissue, for they may be found in various stages of advancement in the same root. Their nature I have not been able to ascertain.

The author then proceeds to describe the development of the spores. A transverse section of the involucrem when about the size of a small pin's head shows it to consist of four integuments, containing a mass of very delicate spongy compressible cellular tissue, subdivided into four equal triangular portions by four lines radiating from the centre. In the centre of each of these portions is a cavity, and projecting into each of these cavities are a number of nipple-like processes which are attached in each cavity to a common receptacle, whilst this again is connected with an open rigid cellular tissue that lies between the spongy tissue before described and the involucrem, and serves as a connexion between the two. As the involucrem advances, the spongy tissue recedes all round the four cavities, which consequently become larger and afford more space for the growth of the nipple-like processes. This recession of the spongy tissue is not caused by the pressure of the growing processes, for it is frequently in advance of them; but it is produced by a gradual condensation inherent to the tissue around the cavities and along the radiating dividing lines, which, in fact, are nothing more than this condensation, which at maturity is so complete that the whole of the spongy tissue is condensed into four dissepiments, dividing the cavity of the involucrem into four equal loculi. The nipple-like processes are found upon a careful examination to be hollow sacs with obscurely cellular walls—those which occupy the lowest part of the involucrem being considerably in advance of the upper ones. These sacs contain a quantity of grumous matter, and

a number, perhaps about ten, of soft rather opaque pulpy bodies, which are evidently compounded of four closely connected parts so placed on each other as to form a cone with a triangular base.

April 2.

The Lord Bishop of Norwich, President, in the Chair.

Henry Bingley, Esq., Queen's Assay Master, Royal Mint; Joseph Dickinson, M.B., Lecturer on Botany at the Philosophical Institution, Liverpool; George Everett, Esq., Clapham; and John Miers, Esq., Chelsea, were elected Fellows of the Society.

Mr. Owen read a Paper on a New Species of the genus *Lepidosiren* of Fitzinger and Natterer. The author commenced by advertising to the first announcement of that anomalous animal, the *Lepidosiren paradoxa*, as the type of a new genus of Perennibranchiate Reptiles by Fitzinger at the meeting of the German naturalists at Prague in 1837, and to its subsequent description by its discoverer Dr. Natterer, the well-known South American traveller.

With the generic characters assigned by these able German naturalists to their *Lepidosiren*, the species described by Mr. Owen fully and closely agreed; but it differed specifically in the greater relative length of the head and rudimental extremities, and its much smaller size.

Mr. Owen observed, that since the time of the discovery of the *Ornithorhynchus* there had not been submitted to naturalists a species which proved more strongly the necessity of a knowledge of its whole organization, both external and internal, in order to arrive at a correct view of its real nature and affinities, than did the *Lepidosiren*, and as he had felt a reluctance to bring before the Society an incomplete description, which might only have served to raise new doubts in the minds of naturalists with regard to this animal, he had deferred since June 1837 the completion and communication of the present paper. He had however at that time prepared a brief description of the specific characters of the specimen in question, under the name of *Protopterus*, and had referred it in the Catalogue of the Museum of the College of Surgeons to the Class of Fishes, on account of its scaly covering and the condition of its nostrils as plicated sacs, and to the abdominal family of the Malacopterygian order of that class, in which it seemed to present an extreme modification

or rudimental condition of the fins indicative of a transition from the abdominal to the apodal families.

The anatomical details which formed the principal part of the present communication, confirmed the propriety of referring the *Lepidosiren* to the class of fishes; but they also led, Mr. Owen observed, to a considerable extension in his original views of its affinities in that class.

A minute description was then given of the external characters and peculiarities of the present species, which differed from the *Lepidosiren paradoxa* in the greater relative length of the head and rudimental fins as compared with that of the trunk; and in its general size, which is three-fourths smaller.

The chief peculiarities of the *skeleton* consist in its imperfect, or rather partial ossification, and in the green colour of the ossified parts; in which it resembles that of the gar-pike (*Belone vulgaris*). The parts which continue permanently in the cartilaginous condition are the petrous elements of the temporal bones containing the acoustic labyrinth, a portion of the articular pedicle of the lower jaw, the branchial arches, and the bodies of the vertebræ: these, moreover, are not separated to correspond with the neurapophyses and ribs, as in Plagiostomous Cartilaginous Fishes, but retain their primitive confluent condition as a round continuous chord, extending from the occiput to the end of the tail: this vertebral chord consists of an external firm, elastic, yellowish capsule, enveloping a softer subgelatinous material, as in the Cyclostomous Fishes. The corresponding parts or basilar elements of the cranial vertebræ were ossified: and Mr. Owen then entered upon a detailed description of the skull.

The ribs are thirty-six pairs, and consist of short, slightly curved, slender styles, encompassing, with the spine, about one-sixth part of the cavity of the abdomen. These ribs are attached to the lower part of the side of the fibrous sheath of the central vertebral chord; their pointed free extremities are cemented to the intermuscular ligaments.

The superior spines are throughout separated from the neurapophyses, and these are not anchylosed together at their upper extremities. Hæmapophyseal spines are developed in the caudal region, and both these and the neurapophyseal spines have articulated to them dermo-osseous spines, of equal length, with their distal extremities expanded, and supporting the transparent elastic horny rays of the caudal fin. The rudimental filiform pectoral and ventral fins were supported each by a single cartilaginous ray composed of many joints.

The muscles of the head, jaws, hyoid and branchial apparatus

were then described: the muscular system of the body consists of subvertical layers of oblique fibres separated at brief intervals by aponeurotic intersections.

The following peculiarities of the *Digestive system* were then pointed out;—two long, slightly curved, slender, sharp-pointed teeth project from the intermaxillary bones, which are moveable. The upper maxillary bones support each a single dental plate divided into three cutting lobes, by two oblique notches entering from the outer side: the lower jaw is armed with a single dental plate similarly modified, the produced cutting edges fitting into the notches above: these maxillary teeth somewhat resemble the dental plate of the extinct *Ceratodus* of Agassiz. The fleshy and sensitive parts of the tongue are more developed than in fishes generally. The jaws are adapted to minutely divide and comminute alimentary substances; the pharyngeal opening is contracted; the entrance to the pharynx guarded by a soft semicircular valvular process. Gullet short, straight, narrow, but longitudinally plicated. Stomach simple, straight, with thick walls, in capacity corresponding with the œsophagus; terminating by a valvular pylorus projecting with a scalloped margin into the intestine. No pancreas or spleen. Liver well-developed, partly divided into two lobes. A gall-bladder, and large ductus choledochus, opening by a valvular termination close to the pylorus. Intestine round, straight, at first of equal diameter with the stomach, but gradually contracting to the vent, with thick parietes; traversed internally by a spiral valve describing six gyrations; the first of which is the longest.

The *respiratory organs* consist of branchiæ, and a double elongated air-bladder, with the usual vascular and cellular structure of the lungs of a reptile.

The *branchiæ* consist of elongated, sub-compressed, soft, pendulous filaments, attached to cartilaginous branchial arches; these arches are not joined together, or to the os hyoides by an intermediate chain of cartilages or bones below, nor are they articulated to the cranium above. There are six branchial arches on each side, and five intervals for the passage of the water from the mouth to the branchial sac. All the branchial arches do not support branchial filaments; but only the first, fourth, fifth, and sixth. The first and last branchial arches each support a single row, the fourth and fifth each a double row of branchial filaments. The second and third branchial arches have their full proportions, but offer not the slightest trace of gills. The branchial sac is pretty large, and opens externally by a small vertical fissure immediately anterior to the rudimental pectoral extremities.

The *heart* is situate below the œsophagus, in a strong pericardium ; it consists of a single auricle and ventricle and a contorted bulbus arteriosus, with a longitudinal valvular process as in the *Siren*. The two branchial arteries, which wind round the gill-less arches, afterwards unite together on each side, and give off branches which form the pulmonary arteries, or those which go to the air-bladders.

The apparatus for aerial respiration commences by a short, single, wide and membranous trachea, or *ductus pneumaticus*, which commences by a longitudinal laryngeal slit, one line in extent, situated three lines behind the orifice of the pharynx : a single plate of cartilage is continued from this laryngeal opening forwards to that of the pharynx : the plate is as broad as the floor of the pharynx, and its office seems to be to prevent the collapse of the parietes of that tube, and to keep a free passage for the air to the trachea. This tube dilates at its lower end into a sac with very thin parietes, which communicates directly with each division or lobe of the air-bladder. These lobes or *lungs* are partially subdivided into small lobes at their anterior and broadest part ; and then continue simple and flattened, gradually diminishing to an obtuse point situated behind the posterior extremity of the cloaca. The whole of the parietes of the lungs is honey-combed : the cells are largest, deepest and most vascular and subdivided at the anterior and broader end of the lung. The lungs are situated behind the ovaria, the kidneys, and the peritoneum, which is in contact with merely that part of their ventral flattened surfaces, not covered by other viscera.

The two *kidneys* are quite distinct, very long and narrow, but broadest towards the cloaca : the ureters communicate with the back part of the common termination of the oviducts. There were not any suprarenal bodies, nor any spleen.

The *ovaria* are two long, flattened bodies, with ovisacs and ova of different sizes : many between 2 and 3 lines in diameter, scattered among clusters of other ova of smaller size. The *oviducts* are distinct tortuous tubes, which commence by a very wide and thin-coated portion, opening by a slit, 3 lines wide at their anterior extremity, and not communicating with each other before opening into the peritoneal cavity, as in the *Plagiostomes*. The oviduct contracts and performs many short undulations, adhering to the ovarian capsule as it descends : its coats become thicker, and oblique spiral folds are developed from the inner surface ; the capacity of the oviduct increases before its termination, which is by a single prominent opening, common to the two oviducts in the posterior part of the cloaca.

A small *Allantois* is situated between the oviduct and rectum. The cloaca receives the above parts in the following order,—first, or

most anteriorly, the common opening of the peritoneal canals ; secondly, the anus ; thirdly, the Allantoid bladder ; fourthly, the oviducts, with the ureters, which open into the back part of the oviducts.

The *brain* consists of two elongated subcompressed distinct cerebral hemispheres ; a single elliptical optic lobe, or representative of the bigeminal bodies ; a simple transverse cerebellar fold, not covering the widely-open fourth ventricle ; largely developed pineal and pituitary glands ; and a single corpus mammillare.

The *nerves* given off from the brain, were the olfactory ; the optic, which arose from the same point at the middle line between the crura cerebri, and did not decussate ; the fifth pair ; the acoustic ; the pneumogastric ; and lingual nerves : there were no traces of the third, fourth, or sixth nerves ; there being no muscles to the eyeballs.

The *eyes* are very small, and adhere to the skin, which passes over them without forming any projection : they have a small spherical lens, and no choroid gland.

The *organ of hearing* consists of a vestibule enclosed in a thick cartilaginous case, without external communication except for the foramina transmitting the *portio mollis* : it consists of two large otolithic sacs, containing each a white chalky mass ; the external one being six times the size of the one next the brain : above these sacs are three small semicircular canals. No trace of tympanic cavity or *Eustachian tube*.

The *organ of smell* consists of two oval membranous sacs, plicated internally, and having each a single external aperture upon the upper lip ; but without any communication with the mouth,—a structure which the author observed was perhaps the only single character which unexceptionably proved the *Lepidosiren* to be a true fish. The remaining evidence of its ichthyic nature reposed rather upon the concurrence of many less decisive characters.

These characters were stated to be, its covering of large round scales ; the mucous ducts of the head and lateral line ; the many-jointed soft ray supporting the rudimental pectoral and ventral fins ; the gelatinous vertebral chord, united anteriorly to the whole of the basi-occipital, and not to two condyles as in *Batrachia* ; a præ-opercular bone, the intermaxillary bone being moveable ; the lower jaw having each ramus composed simply of a post-mandibular and dentary piece ; the double row of spinous processes, both above and below the vertebral chord ; the green colour of the ossified parts of the skeleton ; the straight intestine, with its spiral valve ; the absence of pancreas and spleen ; the single peritoneal outlet ; the position

of the anus ; the single auricle of the heart ; the number of branchial arches, and the internal position of the gills ; a long lateral nerve ; acoustic labyrinth with large otolithes. These characters, with the nasal sacs opening only externally, prove satisfactorily the *Lepidosiren* to be a true Fish, and not a Perennibranchiate Reptile.

In the class of fishes, Mr. Owen pointed out the interesting relations of the *Lepidosiren* as a link connecting the Cartilaginous fishes with the Malacopterygians, and especially with the *Sauroid* genera, *Polypterus* and *Lepidosteus*, and at the same time making the nearest approach in the class of fishes to the Perennibranchiate Reptiles.

For the species here described Mr. Owen proposed the name of *Lepidosiren annectens*. It is a native of the river Gambia, Africa.

April 16.

The Lord Bishop of Norwich, President, in the Chair.

Read, "Remarks on British Lichens and Fungi, principally on species or varieties new to our Flora." By Churchill Babington, Esq.

The object of Mr. C. Babington in this paper is to give descriptions of some species or varieties of Lichens and Fungi hitherto unpublished in any British Flora, and also to communicate observations on the transit of monstrosities to their proper forms. The Lichens brought into notice as not yet introduced into the British Flora are, *Lecanora elatina*, Ach., from Rose Hall, Cumberland ; *Sterocaulon denudatum*, Flörke, (confounded with *S. paschale*) from Scotland ; *Lecidea nitidula*, Fries, also from Scotland ; *Lecidea miscella*, Ach., as distinct from *L. miscella*, Eng. Bot. ; *Biatora Krockiana*, Hoppe, from Isles of Rum and Skye ; *Biatora anomala*, Fr., from Yoxall Lodge ; *Opegrapha signata*, Ach., from Herefordshire ; and *Verrucaria margacea*, Wahl., from Charnwood Forest. Among the Fungi are, *Agaricus Mariae*, Klotsch ; *A. serrulatus*, Fr. ; *Thelephora ferruginea*, Pers. ; *T. lactea*, Fr. ; *T. laevis*, Pers. ; *Peziza Ledi*, Alb. and Schw. ; *Stictis lichenicola*, Mont. ; *Sclerotium roseum*, Kneiff. ; *Sphaeria scoriadea*, Fr. ; *S. mesiota*, Bab. ; *S. rhytismoides*, Bab. ; *S. arbuticola*, Fr. ; *S. alnea*, Fr. ; *S. ostruthii*, Fr. ; *S. Depazea*, Fr. ; *Depazea pyricola*, Desm. ; *Dothidea chaetomium*, Kunze ; *Stemonitis pulchella*, Bab. ; *Stilbum aurantiacum*, Bab. ; *Syzygitis megalocarpus*, Ehrenb. ; *Stibospora macrosperma*, Pers. ; *Coniothecium amentaceum*, Corda ; and *Xenodochus carbonarius*, Schl.

Read, "On a Gall gathered in Cuba, by W. S. MacLeay, Esq., on the leaf of a plant belonging to the order *Ochnaceæ*." By the Rev. M. J. Berkeley, M.A., F.L.S.

The gall is remarkable for its very close resemblance in habit and form to some epiphytous Fungi, for possessing a distinct operculum, and, especially, for bursting through the cuticle, which surrounds it in the form of a few laciniaë at the base. Mr. Berkeley pointed out various forms of galls and other productions of insects which have been described as Fungi, but in none is the resemblance so striking as in the present. He regretted that he was not able to throw any light upon the animal by which it is caused, though he was able to state positively that it is an animal production, as in most instances decayed exuvia were found in its cavity, and in one case a little imperfect grub, which was however unfortunately lost.

May 7.

The Lord Bishop of Norwich, President, in the Chair.

John Hawkins, M.D., of St. Albans, was elected a Fellow; and Carl Gustav Carus, M.D., of Dresden, Henri Dutrochet, M.D., and Henri Milne Edwards, M.D., Members of the French Institute, Stephen Endlicher, M.D., of Vienna, and John Torrey, M.D., of New York, were elected Foreign Members of the Society.

Read, "Supplementary Observations on the Development of the Theca, and on the Sexes of Mosses." In a letter to R. H. Solly, Esq., F.R.S. & L.S. By William Valentine, Esq., F.L.S.

The author commences his letter by stating that subsequent observations have induced him to concur entirely with the views of Professor Mohl as to the sporules of Mosses being developed by four in a mother cell, a fact which he was led to doubt in his former communication printed in the 17th volume of the Society's Transactions. The present paper contains a detailed account of the development of the theca in *Ædipodium Griffithianum*, which exhibits a beautiful example of the tetrahedral union of the sporules. In this moss the four sporules in each mother cell are piled on each other so as to form a cone with a triangular base, and they appear to be connected with each other in the young state by a very minute stalk which is situated at the conjunction of three radiating lines. This connexion

is perhaps in most instances dissolved at an early period, and the sporules recede a little from each other, but are still kept in the triangular form by the mother cell. It is not uncommon however to find the connexion unbroken after the sporules have arrived at maturity, and in these instances there seems to be a general adhesion at the opposing faces of the sporules.

The author concludes his paper with some remarks on the analogy that exists between sporules and pollen, which he observes, is so remarkable, and the particulars so numerous, that the essential identity of the two can be scarcely a matter of opinion.

May 24.

The Lord Bishop of Norwich, President, in the Chair.

This day, the Anniversary of the birthday of Linnæus, and that appointed in the charter for the election of Council and Officers, the President opened the business of the Meeting, and in stating the number of Members whom the Society had lost during the past year, gave the following notices of some of them :

Samuel Brookes, Esq.—Mr. Brookes was devoted to the science of Conchology, and possessed a valuable collection of British and Foreign Testacea. He was the author of an Introduction to the Study of Conchology which appeared in 1815.

The Rev. Martin Davy, D.D., F.R.S., Master of Caius College, Cambridge.

The Rev. Richard Dreyer, LL.B.

John Lord Farnham.

Charles Holford, Esq.

Lawrence Brock Hollinshead, Esq.

John Hull, M.D.—Dr. Hull was ardently attached to the study of Botany, and in the midst of an extensive medical practice, he found occasional moments of leisure to devote to the cultivation of his favourite pursuit. We are indebted to him for the publication of a British Flora in 1799, of which a second edition appeared in 1808 ; and the Elements of Botany, in 2 volumes, 8vo, in 1800. These works, highly creditable to their author, tended to increase the taste for botanical pursuits.

Matthew Martin, Esq.—Mr. Martin reached the advanced age of 90. He became a Fellow of this Society in 1791.

George Milne, Esq.—Mr. Milne pursued with much ardour the study of Entomology for more than half a century, and his name is familiar to the cultivators of that branch of science in this country. He possessed an extensive cabinet of insects, particularly rich in British and Exotic Lepidoptera. He had retired from London for several years to his native place Johnshaven, Kincardineshire, where he died some months ago at an advanced age.

The Rev. Robert Nixon, B.D., F.R.S.

William Younge, M.D.—Dr. Younge was the early friend and a fellow student of our late distinguished President and Founder Sir J. E. Smith, and the companion of his tour on the continent in the years 1786 and 1787, of which an account appeared in three volumes 8vo, in 1793, and a second edition in 1807. Dr. Younge was elected a Fellow of this Society at its first institution in March 1788.

Amongst the Foreign Members occur *M. Frédéric Cuvier*, Member of the Academy of Sciences of the French Institute, the younger brother of the great Cuvier, and eminently distinguished as a systematic zoologist. He was the author of a work on the value of the teeth as affording zoological characters in the class mammalia, and of a number of valuable papers on Descriptive Zoology in the *Annales* and *Mémoires du Muséum*. He likewise wrote the principal part of the text to the *Histoire Naturelle des Mammifères*, a work which he had undertaken in conjunction with Geoffroy St. Hilaire. Among his last productions may be noticed his *Mémoire sur les Gerboises et les Gerbilles*, printed in the second volume of the *Transactions of the Zoological Society of London*. He was distinguished, like his brother, for his candour and frankness of character, and a total freedom from those petty jealousies which too often beset men of science.

M. Charles de Gimbernat.

Gaspard Count Sternberg, Founder and President of the Royal Museum of Natural History at Prague, a distinguished patron of science, and author of a valuable original work on Fossil Plants, which were chiefly obtained from his own coal mines in Bohemia, and of an excellent Monograph of the genus *Saxifraga*, illustrated by coloured figures. To him we are indebted for the recovery of the vegetable treasures collected by Hænke in Peru, Cochabamba, and in the Philippines, whither he had accompanied the Spanish voyage of discovery under the celebrated, but unfortunate, Malaspina. These interesting plants have been published by Presl, under the auspices

of Count Sternberg, in a work entitled 'Reliquiæ Hænkeanæ.' Count Sternberg was distinguished for his urbanity, hospitality, and an eager desire to promote every useful work. He left his collections and books of Natural History to the Museum already mentioned.

Among the Associates are the following :

Mr. John Hunneman.—Mr. Hunneman having been long the medium of communication between the botanists of this country and those of Germany, Switzerland, and Russia, our collections have been enriched through his means with a vast variety of new and interesting plants. A curious Mexican genus, belonging to the natural family *Papaveraceæ*, bears his name, and commemorates the services rendered by him to science.

Mr. George Penny.—He was well acquainted with the plants which he successfully cultivated, and was the author of the 'Hortus Epsomensis', and of several papers on Garden Botany in Mr. Loudon's Gardener's Magazine.

Mr. William Weston Young made the drawings for Mr. Dillwyn's valuable work on British Confervæ, and a series of drawings of British birds now in the possession of Mr. Yarrell.

The President also announced that twenty Fellows, five Foreign Members, and two Associates had been elected since the last Anniversary.

At the election, which subsequently took place, the Lord Bishop of Norwich was re-elected President ; Edward Forster, Esq., Treasurer ; Francis Boott, M.D., Secretary ; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out, viz. W. J. Burchell, Esq., J. W. Lubbock, Esq., Hugh Duke of Northumberland, John Forbes Royle, M.D., and William Yarrell, Esq.

June 4.

Edward Forster, Esq., V.P. in the Chair.

Mr. George William Francis was elected a Fellow of the Society.

Read, "Further Observations on the *Spongilla fluviatilis*, with some remarks on the nature of the *Spongia Marinæ*." In a letter to the Secretary, by John Hogg, Esq., M.A., F.L.S.

In the latter portion of this letter the author endeavours (in addition to what has been already stated at p. 8,) to demonstrate the vegetability of the river sponge, from the following facts, which were obtained by many experiments made by him upon that substance during the last two summers.

1. From the general resemblance of the membrane which invests the soft portion or jelly with the membrane or cuticle of the leaves of many plants.

2. From this gelatinous or soft portion being so similar to the parenchymatous substance of the more fleshy kinds of leaves, and being chiefly composed of numerous pellucid globules.

3. From the green colouring matter or chromule contained in those globules, on being pressed out, giving a permanent green or yellowish-green colour to white paper, as is the case with the chromule of leaves.

4. From strong acids having the same effects on this sponge as they are seen to have upon plants when they are macerated in them.

5. From the mode in which numerous bubbles of gas, most probably oxygen, are disengaged from the surface of the living mass of *Spongilla*, when exposed to the brightest solar light, being so extremely analogous to that which is known to occur with the leaves of a plant when immersed in water and submitted to the direct action of the light of the sun.

As to the currents of water which take place in the *Spongilla fluviatilis*, and are so similar to those which have been noticed by Dr. Grant and other authors in the sea sponges, and relied upon by them as the best evidence of their supposed animal nature, Mr. Hogg has, after many careful experiments, never been able to witness them taking place in any specimens which have been entirely destitute of every parasitical insect or other animal; he therefore concludes that these currents are caused by some insect, which is seen so generally to inhabit nearly every specimen of the *Spongilla*; and by means of the animal's performing the function of respiration, the streams or currents of water are found to enter into and flow out from the pores or oscules of that structure. But if on future investigation it shall be proved that these currents do occur in such individual masses of the *Spongilla fluviatilis* as are quite free from every parasite, Mr. Hogg would then consider that they are effected by the same agents as cause the motions or circulation of the fluids in vegetables.

The author has not perceived any trace of animal organization, or the least symptom of sensation, or any powers of contraction and dilatation in this species of sponge, although he has applied to it, when in a fresh and vigorous state, several sorts of powerful stimuli,

He next showed that no arguments in support of the fancied animality of the *Spongilla* can be brought forward, either from its smelling like carrion or animal matter, or from numerous spiculæ being present in its composition. And the manner in which he raised young *Spongillæ* from the seed-like sporidia and locomotive sporules makes it perfectly conclusive that this freshwater sponge cannot be, as Montagu supposed, the nidus of some aquatic insect, although such an opinion might, without those successful experiments, have been somewhat confirmed by the author's discovery of an unknown and anomalous insect, which he has at present only observed inhabiting this production. Some specimens of this small insect were exhibited, and presented to the Society.

Mr. Hogg concluded his letter with some general remarks on the nature of the *Spongiæ marinæ*. He stated that hitherto he had always accounted these substances as being principally composed of an animate or live jelly, which was endowed, as some authors affirmed, with a certain degree of sensation, and consequently had, fourteen years ago, instituted for them an order "*Gelatinifera*," which he arranged the last among the *Polyparia Composita*. That on becoming convinced by his late researches on the river sponge of its vegetability, he began in some measure to concur in the opinion of Montagu, that that substance might probably be quite distinct from the sea sponge, and to think that the latter might still be of an animal nature; but, on a more recent examination and comparison of the *Spongilla* with many of the *Spongiæ*, he has found that there exist no real grounds for that opinion, and that there scarcely is even a generic difference between them.

The author then compared the freshwater sponge with the sea sponge, and showed, among other extreme resemblances in their structure and composition, that many of the latter possess similar seed-like bodies or sporidia, as well as the locomotive germ-like bodies or sporules which have been described by Dr. Grant.

Mr. Hogg concludes, if the currents of water do flow in and issue out from the sea sponge, independent of the function of respiration of any marine insect or parasitical animal nestling within it, that then they are caused by the same means which effect the motions of fluids in plants, and that these currents convey nutriment to the inner parts of the sponge, after the same manner as food is supplied to vegetables. He observed that neither the odours of the fresh, dried, and burnt sponges, nor the presence of ammonia in them, afforded proofs of their animality, and that there really is no more peculiarity in their chemical composition than what likewise exists in that of certain plants.

Mr. Hogg therefore maintains it to be impossible to account the *Spongilla* as belonging to the vegetable kingdom and the *Spongia* to the animal ; and since he has become sure of the former, and since the *Spongia* is now known to possess neither one organ nor a single property peculiar to an animal, he has been at length forced to acknowledge the vegetable nature of the *Spongia*.

Moreover, the fact of Dr. Grant having witnessed the locomotive sporules of some of the sea sponges germinating and developing themselves after the forms of their parent structures, at once decides that they cannot be the nidus or matrix, or the fabrication or production of any marine animal.

Lastly, Mr. Hogg, considering to what order of plants the fresh-water and the sea sponges should be referred, proposed to classify them in a separate order "*Spongiæ*," which ought to be placed between the orders *Fungi* and *Algæ*.

June 18.

Mr. Forster, V.P., in the Chair.

The Secretary read a letter addressed to him by the President nominating the four following Members of the Council to be Vice-Presidents for the year ensuing, commencing the 24th of last month, viz.

Robert Brown, Esq.; Edward Forster, Esq.; Thomas Horsfield, M.D.; Aylmer Bourke Lambert, Esq.

The V. P., in the chair, read a notice, addressed to the Society from Upsal, announcing the death of Louisa von Linné, the third and last surviving daughter of Linnæus, which took place at Upsal, on the 21st of March last, at the very advanced age of 90.

Read "A Biographical Sketch of Ferdinand Bauer, Natural History Painter to the Expedition under Capt. Flinders." By Dr. John Lhotsky. Communicated by the Secretary.

Ferdinand Bauer, the celebrated Natural History Painter and Traveller, was born in the year 1760, at Feldsberg in Austria, where his father held the appointment of Painter to Prince Lichtenstein.

In the year 1775 we find him employed by the Rev. Norbert

Boccius, of the same place, to make miniature paintings of plants from nature.

In 1784, while still in the same employment, he was through the recommendation of the elder Jacquin engaged by Dr. Sibthorp to accompany him in his first Journey to Greece, and on his return he was for several years occupied in finishing the numerous drawings of plants made in that journey, and which prove him to have been, even at that period, a very accurate observer, as well as a highly accomplished artist.

In 1801 he was selected by Sir Joseph Banks as the Natural History Painter in the voyage of Capt. Flinders. From this expedition he returned to Europe in 1805, bringing with him no less than 1600 finished sketches of plants, besides numerous drawings of animals, of equal merit, and for several years was engaged in finishing a selection of his drawings of plants, which are deposited at the Admiralty, the board by which he was employed.

After the Investigator was condemned as unfit for the prosecution of the voyage, and Capt. Flinders had left New Holland to return to Europe, Mr. Bauer, along with Mr. Brown, remained in New South Wales, chiefly at Port Jackson; but he also visited and remained a considerable time in Norfolk Island, where he diligently collected and made drawings of all the plants of that remarkable island, and from his materials Dr. Endlicher has lately published his very interesting 'Prodromus Floræ Norfolkicæ.'

In 1813 Mr. Bauer commenced the publication of a work entitled 'Illustrationes Floræ Novæ Hollandiæ,' which did not extend beyond three numbers, and of these the last was finished at Vienna, where he had returned in 1814. This work met with very little encouragement, either in this country or in his own.

In the vicinity of Vienna he continued to reside, employing himself in drawing the more remarkable plants that flowered in the imperial gardens of that capital, and even in making occasional botanical excursions into the Austrian and Styrian Alps. Besides the works already noticed, during his stay in England he prepared the greater part of the drawings of the first volume of Mr. Lambert's work on the genus *Pinus*, and the plates of that work were chiefly coloured by him. He also prepared a series of drawings of the species of *Digitalis*, which have since been published by Dr. Lindley, in his 'Digitalium Monographia.'

Mr. Bauer was seized with a severe illness in 1825, which terminated in his death on the 17th of March 1826, having attained the age of 66.

Read, "A Notice of a Plant which produces perfect Seeds without any apparent action of Pollen on the Stigma." By Mr. John Smith, A.L.S.

The subject of the present notice belongs to the natural family of *Euphorbiaceæ*, and has been cultivated for several years in the Royal Botanic Garden at Kew, under the name of *Sapium aquifolium*. It is a native of Moreton Bay, on the east coast of New Holland, where it was discovered by Mr. Allan Cunningham, who sent three plants of it to Kew in 1829. A short time after their introduction the plants flowered, and they proving to be all females, they were naturally passed over as belonging to a diœcious plant, until Mr. Smith's attention was particularly drawn to them by the fact of their producing perfect seeds. They have annually flowered and matured their seeds since, and notwithstanding the most diligent search and constant attention no male flowers or any pollen-bearing organs have been detected. Young plants have been raised at different times from the seeds, and they bear so close a resemblance to their parents that it is scarcely possible even to suspect the access of pollen from any other plant.

Mr. Smith considers the plant as the type of a new genus, which he names *Calebogyne*. It forms an irregularly branched, rigid, ever-green shrub, of about three feet in height, with alternate, petiolate, elliptical, mucronate, coriaceous leaves, having three large spinous teeth on each side, and furnished with two small subulate persistent stipules. The paper was accompanied by a young plant raised from seed produced at Kew, and by a beautiful drawing of the parts of fructification from the pencil of Mr. Francis Bauer.

Read also, "Descriptions of newly discovered Spiders." By John Blackwall, Esq., F.L.S.

This paper comprises descriptions of new species of Spiders, recently discovered, and principally by the author himself, in the north of England and Wales, and it must be confessed that the success which has attended his labours in this department is greater than could have been anticipated, no fewer than fifty-three species having been added by him to the catalogue. Much of this success is to be attributed to the fact of his attention having been chiefly directed to those species which, on account of their diminutive size, require the aid of optical instruments, of a high magnifying power, for their accurate examination.

The genera to which the species chiefly belong are *Drassus*, *Clubiona*, *Lycosa*, *Agelena*, *Theridium*, *Walckenaera*, *Neriene* and *Linyphia*.

NÓ. V.—PROCEEDINGS OF THE LINNEAN SOCIETY.

November 5.

Edward Forster, Esq., V.P., in the Chair.

The Society assembled this evening for the Session.

Beriah Botfield, Esq., of Norton Hall, Northampton, was elected a Fellow of the Society.

The Rev. William Wood, B.D., F.L.S., exhibited specimens of a variety of *Typha angustifolia*, remarkable for its small size, and the shortness of its female catkins, collected by him in the extensive marshes situate between Sandwich and Deal.

Read, "Descriptions of some new Insects collected in Assam, by William Griffith, Esq., Assistant Surgeon in the Madras Medical Service." By the Rev. F. W. Hope, M.A., F.R.S. & L.S.

The insects described in this paper, some of which are remarkable for their size and splendid colours, were mostly collected in Assam by Mr. Griffith, during the stay of the late Scientific Mission from Calcutta, to which he was attached. They chiefly belong to the longicorn beetles, and to the family of *Lamiadæ*. The following are the characters of the new genera and species :

LAMIA.

1. *L. Horsfieldii*.

Long. lin. 26 ; lat. lin. 8½.

Corpus cinereum ; antennis corpore longioribus elytrisque flavo-cretaeis maculisque ornatis, antennæ articulis tribus primis subscabris.

This species, which has been named in compliment to Dr. Horsfield, is the largest of the family, and is nearly related to *L. catenata* of De Haan from Japan.

G. N. EUOPLIA.

Corpus subdepressum. *Antennæ* lamiæformes, ferè ut in *Omacanthâ*.

Thorax utrinque spinosus, dorso punctulatus. *Elytra* depressa, apicibus 2-spinosis, spinâ suturali minore, lateralibus majoribus. In reliquis cum *Lamiâ* convenit.

1. *E. polypila*.

Besides the one enumerated, the author possesses five other species, all natives of India, and which are still undescribed.

G. N. OPLOPHORA.

Caput ferè quadratum. *Mandibulæ* falciformes. *Antennæ* corpore paullò longiores, articulis basi pallidis. *Thorax* utrinque armatus, dorso for-

titer rugoso, tuberculo in medio disci posito. *Elytra* thorace 4-plò longiora, basi sinuata, subscabra, gradatim e humeris ad apicem magnitudine decrescentia, apicibus rotundatis. *Corpus* infrà annulis abdominalis ad apicem sensim attenuatis. *Pectus* valdè convexum, mucrone armatum. *Pedes* difformes et robusti.

1. *O. Sollii*.

This splendid species is dedicated to Richard Horsman Solly, Esq., F.R.S. & L.S., in whose cabinet the chief part of the insects described in this paper is contained. To the same genus belong *Lamia punctata* of Fabricius, and two undescribed Indian species.

G. N. ANOPLOPHORA.

Caput quadratum. *Antennæ* corpore duplò longiores, ultimo articulo valdè elongato. *Thorax* utrinque spinosus, medio depressus. *Elytra* anticè et posticè ferè æqualia, apicibus rotundatis. *Corpus* infrà squamosum, pectore inermi. *Pedes* difformes et robusti.

1. *A. Stanleyana*.

This insect, distinguished for its brilliant colours, which rival those of some of the more splendid Lepidoptera, has been named in honour of the Lord Bishop of Norwich, President of the Linnean Society.

CALLICHROMA, *Latr.*

1. *C. Cantori*.

Long. lin. 21 ; lat. lin. 5.

Viride, nitidum ; antennis violaceis, femoribus tibiisque lætè cyaneis tarsisque aureo-ornatis.

This species is named in compliment to Dr. Cantor, a distinguished zoologist in the service of the East India Company, and whose valuable collection of Indian Reptilia and drawings are deposited in the Radcliffe Library at Oxford.

2. *C. Griffithii*.

Long. lin. 20½ ; lat. lin. 8.

Obscurè atrum ; antennis tarsisque luteis, elytris nigris et flavo-fasciatis.

This species is dedicated to its discoverer, an acute and enterprising botanist, and author of two valuable memoirs on the development of the ovulum of *Santalum* and *Loranthus*, printed in the 18th Volume of the Society's Transactions.

MONOCHAMUS, *Megerle*.

1. *M. ruber*.

Long. lin. 11 ; lat. lin. 4½.

Ruber ; antennis corpore duplò longioribus, thorace elytrisq[ue] nigro-maculatis, pedibus concoloribus.

Read also, "On *Cuscuta epilinum* and *halophyta*." By Charles C. Babington, Esq., M.A., F.L.S.

The first of these species has been recently added to the British Flora by J. E. Bowman, Esq., F.L.S., having been found by him growing abundantly on flax, near Trelydan Hall, Montgomeryshire, in August last. The other species, which occurs on the coast of Norway, growing upon *Chenopodeæ*, has not been hitherto observed in this country. The author gives the following characters of the two plants:—

1. *C. epilinum* (Weihe), florum glomerulis bracteatis sessilibus, squamis palmati-subsexfidis tubo corollæ semper ventricoso adpressis, sepalis carnis basi deltoideis corollâ vix brevioribus.
2. *halophyta* (Fries), "florum glomerulis subbracteatis" sessilibus, squamis bifidis tubo corollæ ventricoso adpressis: segmentis bifidis, calyce corollâ multò breviori.

November 19.

Edward Forster, Esq., V.P., in the Chair.

William Borrer, Jun., Esq., B.A., of St. Peter's College, Cambridge; Richard Davis, Esq., of St. Helen's Place; and Christopher Parsons, Esq., of South Church, Essex, were elected Fellows of the Society.

Read, "A Monograph of the genus *Disporum*." By D. Don, Esq., Libr. L.S., Prof. Bot. King's College.

This genus was first suggested by Mr. Brown, in his 'Prodromus Floræ Novæ Hollandiæ'; and the name of *Disporum* was subsequently given to it by Salisbury in the first volume of the Transactions of the Horticultural Society of London. It remained, however, undescribed, and almost unnoticed, until the publication of the author's work on the plants of Nepal, in which a detailed description of the genus, and the characters of two additional species were given. The characters of the genus consist in its campanulate perianthium, with the sepals produced into a pouch or spur at the base, in the cells of its ovary bearing two ovula, in its baccate pericarpium, and in its umbellate inflorescence. These distinctions will be found to be common to all the Asiatic species hitherto referred by most

botanists to *Uvularia*. We subjoin the characters of the species described in this paper :—

1. *D. calcaratum*, umbellis pedunculatis sub-5-floris, sepalis lanceolatis acutiusculis basi longè calcaratis, antheris filamentis stigmatibusque stylo triplò longioribus, foliis ovato-lanceolatis sessilibus.

Uvularia calcarata. *Wall. Cat. n. 5087.*

2. *D. Wallichii*, umbellis subsessilibus sub-5-floris, sepalis lanceolatis acuminatis, calcaribus rectis abbreviatis, antheris filamentis 4-plò brevioribus, stylo stigmatibus longiore, foliis ovato-lanceolatis subpetiolatis.

Uvularia Hamiltoniana, B. et C. *Wall. Cat. n. 5088.*

3. *D. Hamiltonianum*, umbellis pedunculatis sub-5-floris, sepalis lanceolatis acutis, calcaribus abbreviatis recurvis, antheris filamentorum longitudine, stylo stigmatibus subæquali, foliis ovato-lanceolatis subpetiolatis.

Uvularia Hamiltoniana, A. *Wall. Cat. n. 5088.*

U. Betua. *Ham. MSS.*

4. *D. Horsfieldii*, umbellis pedunculatis sub-5-floris, sepalis spatulatis mucronatis puberulis, antheris filamentis duplò brevioribus, stylo stigmatibus duplò longiore, foliis ovato-lanceolatis subpetiolatis.

Uvularia Hamiltoniana, D. *Wall. Cat. n. 5088.*

5. *D. Leschenaultianum*, umbellis sessilibus 3—5-floris, sepalis ovato-lanceolatis acutis basi gibbosis, antheris filamentis vix duplò brevioribus, stylo stigmatibus ter longiore, foliis ovatis subpetiolatis.

Uvularia Leschenaultiana. *Wall. Cat. n. 5089.*

6. *D. Pitsutum* (Don, Prodr. p. 50.), umbellis pedunculatis 7—9-floris, sepalis cuneato-lanceolatis obtusiusculis basi gibbosis, antheris filamentis ter brevioribus, stylo stigmatibus duplò longiore, foliis lanceolatis subpetiolatis.

7. *D. parviflorum* (Don, Prodr. p. 50.), umbellis subsessilibus 2—7-floris, sepalis lanceolatis acuminatis basi gibbosis, antheris filamentis duplò brevioribus, stigmatibus stylo ter brevioribus, foliis lanceolatis subpetiolatis.

8. *D. fulvum* (Salisb. in Hort. Trans. i. p. 330.), umbellis sessilibus sub-4-floris, sepalis lanceolatis acutis basi breviter calcaratis, antheris filamentis vix brevioribus, stigmatibus styli longitudine, foliis lanceolatis subpetiolatis.

The author concludes his paper with the description of a new and nearly-related genus, founded upon a plant which was introduced by Mr. Allan Cunningham from New South Wales into the Royal Botanic Garden at Kew, in 1823, and which is remarkable for its unenclosed embryo, and for the singular appendages, similar to those of *Parnassia*, which are seated at the inner base of the sepals. The following is the description of this interesting genus :—

TRIPLADENIA.

Perianthium 6-phyllum, petaloideum, patens, æquale, deciduum : *foliis* æstivatione involutis, basi biappendiculatis! sessilibus. *Stamina* 6, toro, nec basi sepalorum inserta. *Antheræ* erectæ, extrorsæ, biloculares, duplici rimâ longitudinali dehiscentes. *Ovarium* liberum, triloculare : *loculis* biovulatis : *ovulis* campylotropis, collateralibus, erectis. *Stigmata* 3, recurvata. *Pericarpium* subbaccatum, 3-loculare, 3-valve, loculicido-dehiscens : *loculis* 1—2-spermis. *Semina* sub-orbiculata, hinc convexa, inde angulata, v. concaviuscula, glabra, nitida, colore succinea, hilo maximè fungoso-strophiolato, chalazâ orbiculatâ concavâ fuscâ, raphide dimidio seminis vix breviori, elevatâ : *testâ* tenui, membranaceâ : *albumen* copiosum, corneum, album. *Embryo* oblongus, albus, hinc convexus, inde planiusculus, more Graminum extra albumen locatus, eodemque facie planâ applicatus, funiculo maximè strophiolato solummodò obtectus ! extremitate radiculari (cauliculari) paullo latiori. Herba (Novæ Hollandiæ) *perennis*, *rhizomate multicepite*, *caulibus subsimplicibus multangulis*, *foliis amplexicaulibus ovato-lanceolatis*, *pedunculis axillaribus solitariis unifloris infra medium articulatis involucrelloque 3-phylo munitis*.

1. *T. Cunninghamii*.

December 3.

Edward Forster, Esq., V.P., in the Chair.

Edward S. Blundell, M.D., Lower Seymour-street, Portman-square, was elected a Fellow; and the Rev. William Stobbs, Stromness, Orkney, was elected an Associate of the Society.

The Rev. W. S. Hore exhibited a specimen of a remarkable variety of Duck, supposed to be hybrid between the *Anas Boschas* and *Anas acuta* of Linnæus.

Read, "Descriptions of three Vegetable Monstrosities lately found at York." By the Rev. W. Hincks, F.L.S.

Two of these monstrosities occur in species of Iris and much resemble each other. The species are *I. versicolor* and *I. sambucina*. They have 5 parts in each circle, except that the inner circle of petals consists of 4 in one instance and only 3 in the other. It is sufficiently manifest that they are produced by the union of two flowers to form each, and they lead to the conclusion that when Irises with 4 parts in each circle occur (which are not very uncommon) they are

unions of two flowers, one third part of each having perished in the junction. Various other monstrosities consisting in the union of two flowers were compared with the subjects of the description, particularly some of *Oenothera*, flowers having 7 petals, 14 stamens, and 7 stigmas, where the parts preserved in the union are in exactly the same proportion as in the *Irises*.

The third specimen described as a monstrous union of 4 flowers in *Scrophularia nodosa*. The flower-stalk may be perceived to be formed by the adherence of several stalks. The parts found are 15 sepals, 16 petals, 20 stamens, 2 separate ovaria, each with 2 carpels, and a third ovarium formed by the adherence of 2 more, and consisting of 8 carpels. Explanations were attempted of the manner in which the union of 4 flowers would account for these numbers of parts. The increased developement of the circle of stamens, 5 appearing for each flower, though of these several are united in threes together, and two are imperfect, and the increased number of carpels in two of the united flowers, are interesting facts. They show that the union of the flowers had the effect of diminishing and rendering more equable the pressure on the interior circles so as to allow of the growth of parts which are usually abortive.

There was also read, "A monograph of *Streptopus*, with the description of a new genus now first separated from it." By D. Don, Esq., Libr. L.S., Prof. Bot. King's College.

The genus *Streptopus* was established by the elder Richard in Michaux's 'Flora Boreali-Americana,' and was intended to include, besides the *Uvularia amplexifolia* of Linnæus, which is to be regarded as the type, two other species, then entirely new to botanists, namely, *S. roseus* and *lanuginosus*. The first is common to Europe and America, while the two last are confined to the latter continent. A fourth species, a native of Gosaingthan and Kamaon, was described under the name of *simplex* in the 'Prodromus Floræ Nepalensis.' The *lanuginosus* is considered by Professor Don as the type of a new genus, which he has named *Prosartes*, and which is distinguished from *Streptopus* by its lengthened filaments, binary pendulous ovula, and terminal inflorescence. In *Streptopus* the filaments are short, with erect sagittate anthers, the cells of its baccate pericarpium are polyspermous, the seeds erect, and the flowers are axillary and solitary. Both genera belong to the *Smilacææ*, and serve to connect that family with *Melanthacææ*. The characters of the new genus and of the species belonging to both are here subjoined:—

1. *S. amplexifolius* (Lam. et DeCand. Fl. Franc. 3. p. 174.), glaber; pedunculis medio convolutis appendiculatis, sepalis obtusè acuminatis, antheris sagittatis acuminatis, stigmatè trilobo, baccæ loculis 6-spermis.
2. *S. roseus* (Mich. Fl. Bor. Amer. i. p. 201.), hirtellus; foliis ciliatis, pedunculis recurvatis subbifloris, sepalis lanceolatis acuminatis, antheris bicuspidatis filamentorum longitudine, stigmatibus stylo 6-plò brevioribus, baccæ loculis 4—6-spermis.
3. *S. simplex* (Don, Prodr. p. 48.), glaber; pedunculis rectis! nudis, sepalis obtusis, antheris cordato-lanceolatis obtusis, stigmatibus styli sublongitudine, baccæ loculis 10—12-spermis.

PROSARTES.

Streptopi sp., Mich.

Perianthium 6-phylum, petaloideum, campanulatum, æquale, deciduum: *foliis* basi foveolatis v. saccatis. *Stamina* 6, basi sepalorum adnata, simulque decidua. *Antheræ* erectæ, innatæ, obtusæ, biloculares, rimâ duplici marginali longitudinalitèr dehiscentes. *Ovarium* liberum, 3-loculare: *loculis* biovulatis: *ovulis* obovatis, a placentæ apice pendulis! *Stigmata* 3, brevissima, recurvata. *Pericarpium* baccatum, 3-loculare. *Semina* solitaria, v. rariùs bina.

Herbæ (Amer. bor.) *perennes*, *pube ramosâ vestitæ*, *rhizomate diviso multicepite*. *Caules teretiùsculi*. *Folia sessilia, dilatata*. *Inflorescentia terminalis, umbellata*. *Bacca rubra*.

1. *P. lanuginosa*, umbellis bifloris sessilibus, sepalis lanceolatis acuminatis 3-nerviis basi foveolatis, stylo glabro, foliis cordato-ovatis subamplexicaulibus utrinque pubescentibus.
2. *P. Menziesii*, umbellis sessilibus bifloris, sepalis oblongis mucronatis 6-nerviis margine revolutis basi saccatis, stylo longissimo piloso, foliis ovatis sessilibus glabriusculis.

This new species is a native of the north-west coast of America, where it was first found by Mr. Menzies in the voyage of discovery under Vancouver, and it has been very properly named in compliment to that venerable botanist.

The plant bears a close resemblance to some species of *Disporum*, and it moreover agrees with that genus in its sepals being produced into a short spur or pouch at their base. The flowers are considerably larger than those of *lanuginosa*, and they are apparently of a yellow colour. The style is long and copiously hairy. The genus is essentially distinguished from *Disporum* by its innate anthers, nearly concrete styles, and pendulous seeds.

December 17.

Mr. Forster, V.P., in the Chair.

Specimens of the *Lagurus ovatus* collected last summer at Sewer's End, two miles from Saffron Walden, were presented by Mr. Cumming, who discovered the plant about three years ago in that locality, which is its only actual English station.

Read, "Description of the Curata, a plant of the tribe of *Bambuseæ*, of the culm of which the Indians of Guiana prepare their Sarbacans or Blow-pipes." By Robert H. Schomburgk, Esq., communicated by the Secretary.

Referring to a passage in Baron Humboldt's "Personal Narrative" of his Travels in America, in which the learned author describes the reeds of which the Indian Blow-pipes are made, and regrets his inability to determine from what plant they were obtained, Mr. Schomburgk states it to have been a point of the greatest interest with him in his recent journeys in the interior of Guiana to ascertain this fact. He found that the Macusi tribe of Indians obtained these remarkable reeds by barter from the Arecunas, who again made journeys of several months' duration to the westward to procure them from the Maiongcong and Guinan Indians, to whose country they are restricted, and who have thence acquired among the other natives the appellation of the Curata people. The Arecuna thus becomes the medium of the barter carried on of blow-pipes on the one hand for Urari poison on the other, the latter being found in the district inhabited by the Macusi, and exchanged by them for the tube through which the arrows impregnated with it are discharged with such deadly effect. It was at a settlement of Maiongcong Indians near the river Emaruni that Mr. Schomburgk at last succeeded in obtaining positive information of the locality of these reeds, which he was informed were found on two lofty mountains, named by the Indians Mashiatti and Marawacca, the former of which was pointed out to him at the distance of about 20 miles. The latter however lying more directly on his route was visited by him in preference; it is seated at a day's journey from a Maiongcong settlement on the banks of the Cuyaca, from whence the natives showed the beaten track. After having ascended the mountain to a height of about 3500 feet above the Indian village, the traveller followed the course of a small mountain stream, on the banks of which the Curas or Curatas, as these reeds are called by the Indians, grow in dense tufts. They form in general clusters of from forty to a hundred

stems, which are pushed forth, as in many other *Bambuseæ*, from a strong jointed subterranean rootstock. The stem rises straight from the rhizoma, without knot or interruption, and preserving an equal thickness throughout, frequently to the height of 16 feet, before the first dissepiment is stretched across the interior and the first branches are given off. The joints that follow succeed each other at intervals of from 15 to 18 inches; and the whole plant attains a height of from 40 to 50 feet. The stem when full-grown is at the base about an inch and a half in diameter, or nearly 5 inches in circumference; but Mr. Schomburgk mentions having seen young stems, which at the height of 20 feet, and with a thickness of scarcely a quarter of an inch, offered no signs of articulation. The branches are only formed when the stem begins to increase in diameter. The full-grown stem is of a bright green colour, perfectly smooth and hollow within. The branches are verticillate, generally from 3 to 4 feet in length, very slender, terete and nodose; the upper joints separated by an interval of from 2 to 3 inches, and clothed by the sheaths of the leaves, which are split at the apex, persistent, striate and somewhat scabrous. The leaves are linear-lanceolate, obliquely rounded at the base, acute, of a bright green above, glaucescent below, nervoso-striate, with the midrib prominent, and the margin scabrous, from 8 to 9 inches long, and 5 or 6 lines broad; they are furnished with a short petiole, which is articulated to the vagina; and a series of long setæ occupy the place of the ligula. The inflorescence is in terminal spikes, with a flexuose rachis; the locustæ subsessile, lanceolate, lax, from $1\frac{1}{2}$ to 2 inches in length. The entire plant is from 40 to 50 feet in height; but the weight of its innumerable branches causes the slender stem to curve downwards so that the upper part generally describes an arch, which adds greatly to the gracefulness of its appearance. Leaving out of consideration the length of the first nodeless joint, it resembles in its general habit the *Bambusa latifolia* of Humboldt, which Mr. Schomburgk was not unfrequently led into the mistake of confounding with it at a distance. He estimates the height at which it grew as 6000 feet above the level of the sea; and its growth appears to be limited to the chain of sandstone mountains which extends between the second and fourth parallel, and forms the separation of waters between the rivers Parima, Merewari, Ventuari, Orinoco and Negro. The only ascertained localities were Mounts Mashiatti, Marawacca and Wanaya.

Mr. Schomburgk describes at length the process by which the blow-pipes are prepared, and encased, for their better security in the hollowed trunk of a slender species of palm; together with the mode

in which other parts of the apparatus are supplied in order to render it available for its important uses, and the various modifications in its construction occurring among the different tribes. He adds also a particular description of the arrows and quivers in use among several of the native tribes.

To this paper was appended the following note by John Joseph Bennett, Esq. F.L.S.

“Mr. Schomburgk having placed in my hands specimens of the grass which forms the subject of his communication, with a request that (if I should find it to be unpublished) I would describe it, I consulted the publications of Nees von Esenbeck and Kunth, and was at first strongly inclined to suspect that it was identical with the *Arundinaria verticillata* of those authors; but a subsequent examination has satisfied me that it is a distinct species of that genus. I have had no opportunity of comparing it with specimens of *A. verticillata*, but it differs from the descriptions of that species, given by the two eminent botanists above named, in the following particulars. Its leaves are linear, instead of lanceolate, and smooth on both surfaces, instead of scabrous; the mouth of their sheaths is furnished on either side of the articulation of the leaf with a fringe of long rigid setæ, which are not mentioned as occurring in *A. verticillata*; its locustæ are sessile, instead of being pedicelled; and the hypogynous scales are lanceolate and acute, instead of obovate and obtuse. The following character will therefore serve to distinguish the species:—

Arundinaria Schomburgkii.

A. foliis linearibus acuminatis lævibus; vaginarum ore utrinque longè setoso, spicâ simplici pauciflorâ, locustis sessilibus, squamulis hypogynis lanceolatis acutis.”

January 21, 1840.

Mr. Forster, V.P., in the Chair.

Mr. Hyde Clarke, of Great Ormond Street, and James Rankine, M.D., of Ayr, were elected Fellows.

Mr. Hewett Cottrell Watson, F.L.S., exhibited specimens of *Carum Bulbocastanum* discovered by Mr. W. H. Coleman, near Cherry Hinton, Cambridgeshire, and of *Seseli Libanotis* gathered by the same in a Dean west of the river Cuckmere, near Seaford, Sussex, being the first time it has been observed in that county.

Mr. Solly, F.L.S., exhibited two splendid drawings executed by Mrs. Withers of a male plant of *Encephalartos pungens*, which flowered in the Royal Botanic Garden at Kew, in October last.

Mr. Iliff, F.L.S., exhibited some urate of ammonia voided by the *Boa Constrictor* at the Surrey Zoological Gardens, in the midst of which were several larvæ supposed by Mr. Curtis to be those of the *Musca Canicularis* of Linnæus. Mr. Iliff is of opinion they were voided with the excrements of the *Boa*, and referred to a case in the Memoirs of the Medical Society of London, where he believes similar larvæ were voided from the intestines of a man.

Specimens of the *Lastrea rigida* collected at Settle, Yorkshire, were presented by Mr. Daniel Cooper, A.L.S.

Read "Observations on the Ergot." By Francis Bauer, Esq., F.R.S., and L.S.

The author, as is well known, has made the ergot a subject of particular study, and about thirty years ago he undertook, at the suggestion of Sir Joseph Banks, a series of careful microscopical observations, with a view to determine the nature and cause of that singular production, and the beautiful drawings prepared by him at that time, illustrative of the ergot in various stages of its development, form part of the Banksian collections now deposited in the British Museum. Mr. Bauer's investigation led him to determine the ergot to be a morbid condition of the seed, but he was unsuccessful in ascertaining the cause of the disease, which Messrs. Smith and Quekett have satisfactorily shown to be occasioned by a minute filamentous fungus, a fact already recorded at p. 1 & 4. After a long lapse of years Mr. Bauer was induced to resume the subject, and the result has been an additional drawing from his masterly pencil, displaying the minute fungus already noticed in different stages of its growth. The fungus has been named by Mr. Quekett *Ergotetia abortifaciens*.

February 4.

Mr. Forster, V.P., in the Chair.

Thomas White Mann, Esq., of Upper Holloway, was elected a Fellow; and Mr. David Moore, Curator of the Botanic Garden at Glasnevin near Dublin, was elected an Associate of the Society.

Read, "On the *Heliamphora nutans*, a new Pitcher Plant from British Guiana." By George Bentham, Esq., F.L.S.

The interesting subject of this communication was discovered by Mr. Schomburgk growing in a marshy savannah on the mountain of Roraima, on the borders of British Guiana, at an elevation of about 6000 feet above the level of the sea. It belongs to the *Sarraceniaceæ*, and constitutes a very distinct genus of that small but remarkable family of plants, hitherto exclusively confined to the United States. The genus is principally distinguished from *Sarracenia* by the entire absence of petals, small apterous stigma, and trilocular ovary.

The following are the characters of this new genus :

HELIAMPHORA.

Perigonii foliola 4, 5, (vel 6?) hypogyna, libera, æstivatione valde imbricata, subpetaloidea. *Stamina* numero indefinita, hypogyna. *Antheræ* oblongo-lineares, versatiles, biloculares, loculis oppositis longitudinaliter dehiscentibus. *Ovarium* triloculare, ovulis numerosis anotropis pluri-serialiter placentæ axili affixis. *Stylus* simplex, apice truncatus. *Stigma* parvum, obscure trilobum, minute ciliatum. "*Capsula* trilocularis, trivalvis, polysperma" (*Schomb.*). *Semina* obovata, compressa, testa fusca laxiuscula, vix rugosa, in alam fusco-membranaceum semen cingentem expansa. *Embryo* parvus, teres, rectus, prope basin albuminis copiosi, radícula juxta hilum, cotyledonibus parvis.

Herba *perennis, uliginosa*. *Folia radicalia*; petiolus *tubuloso-amphoræ-formis, ore obliquo margine subrevoluto*. *Scapus erectus, apice simpliciter racemosus, glaber*. *Flores nutantes, albi v. pallide rosei*.

1. *H. nutans*.

Read a paper, entitled "On the Structure of the Tissues of *Cycadææ*," By D. Don, Esq., Libr. L. S., Prof. Bot. King's College.

In *Coniferæ* the structure of the stem presents the ordinary appearance of dicotyledonous trees; the annual layers are distinctly marked, and there is a regular bipartition of each into wood and bark (liber); but in *Cycadææ* no bipartition takes place of the fibro-vascular bundles, which in that respect resemble those of monocotyledonous plants, and the differences otherwise are very striking, *Cycas* having, besides a large central pith, several thick concentric alternating layers of cellular and fibro-vascular tissue; and in *Zamia* and *Encephalartos*, besides the pith, there are only two very thick layers, one of fibro-vascular, and the other, which is also the exterior one, of cellular tissue. The great peculiarity of the *Coniferæ*, and which distinguishes them as well from *Cycadææ* as from every other family, is the remarkable uniformity of their woody tissue, which consists of

slender tubes, furnished on the sides parallel to the medullary rays with one or more rows of circular or angular dots; but in *Cycadeæ* no such uniformity is observable, their tissue, as in other phænogamous plants, consisting of two kinds of vessels, namely of slender transparent tubes, without dots or markings, and of dotted, reticulated and spiral vessels, which are capable of being unrolled. The former are identical with the fibrous or woody tissue, whilst the latter, which form a part of each bundle, can only be compared to the strictly vascular tissue of other plants. These dotted vessels in *Cycadeæ* bear a considerable resemblance to the vessels of *Coniferæ*, and especially to those of *Dammara* and *Araucaria*, from the dots being disposed in rows, and confined to the two vertical sides of the vessel only, and they are moreover alternate, as in the two genera just mentioned. In *Cycadeæ*, however, the dots present much less regularity in number and size than in *Coniferæ*, not only in different vessels of the same bundle, but in different parts of the same vessel, forming one, two, three, four, and five rows; and they are not always confined to the vertical sides, but appear in some cases to follow the entire circle of the vessel. Their form is oblong, or elliptical, in *Cycas revoluta*, *circinalis*, *glauca*, and *speciosa*, *Zamia furfuracea* and *pumila*, as well as in *Encephalartos horridus* and *spiralis*; but they are sometimes longer, narrower and nearly linear, giving the vessel the appearance of being marked with transverse stripes. The vessels in all present so much similarity, that no generic distinction can be drawn from them. The dots are always arranged diagonally. The dotted vessels of *Zamia furfuracea* and *pumila* were observed to unroll spirally in the form of a band, presenting a striking resemblance to those of Ferns. The band was found to vary in breadth in different vessels, and was furnished with transverse rows, composed of two, three, or more dots. The coils followed the direction of the dots, and the unrolling was from right to left. In *Cycas revoluta* dotted vessels frequently occur with a single row of dots; but, from the circumstance of the dots on both sides being in view at the same time, they are liable to be mistaken as having a double row on each side. Besides the dotted vessels, there occurs throughout *Cycadeæ* another variety, differing but little from the ordinary spiral vessel, except in the tendency of the coils to unite. In some vessels the coils are free, and the fibre exhibits frequently, at intervals, bifurcations or narrow loops; in others the coils unite at one or both sides, in which case the vessel presents a series either of rings or bars; the fibre then is with difficulty un-

rolled, and it often breaks off into rings, or the bars separate at the point where the coils unite, which is generally on the perpendicular sides of the vessel. In other cases the vessels are distinctly reticulated, and they then exhibit a striking analogy to the dotted cellules in *Cycas revoluta*. All these modifications are frequently to be observed in the same vessel in *Zamia furfuracea* and *pumila*, a fact which affords conclusive evidence of the accuracy of the theory advanced by Meyen, which refers the spiral, annular, reticulated, and dotted vessels to a common type. The dots and stripes are evidently the thinnest portions of the tube, being most probably parts of the primitive membrane remaining uncovered by the matter subsequently deposited on the walls.

The cellular tissue of *Cycadeæ* consists of tolerably regular parenchyma, composed of prismatic, six-sided cellules. In the species of *Zamia* and *Encephalartos*, so often referred to, the walls of the cellules appear to be of a uniform thickness and transparency, and destitute both of dots or markings; but in the adult fronds of *Cycas revoluta* a different structure presents itself, for the walls of the cellules are furnished with numerous elliptical, obliquely transverse dots or spaces, where the membrane is so exceedingly delicate and transparent as to give to the cellules the appearance of being perforated by holes, the intervening spaces being covered by incrustating matter, disposed in the form of confluent bands, which, when viewed under the microscope, resemble a kind of network. The dots or spaces uncovered by incrustating matter, are generally of a large size, and occur more particularly on the vertical sides of the cellules, a band usually running along the middle of the two opposite sides. The bands vary in breadth, as do the dots, and they not unfrequently exhibit minute transparent points or spaces where the solid matter forming the band shows a tendency to separate. The extreme delicacy and transparency of the dots or spaces of whatever size, appear fully to prove that they are parts of the primitive membrane of the cellule, which are uncovered by the incrustating matter. A solution of iodine will be found of great service in determining the actual existence of the membrane at those parts; for although it does not materially alter its colour, it tends very much to diminish its transparency and renders it distinctly visible, so as to leave no doubt that the spaces are not openings. The bands are evidently the result of a partial lignification; and indeed no better example can be offered than *Cycas revoluta* to illustrate and confirm the correctness of the views ad-

vanced by Schleiden as to the origin of the bands and fibres in the cellules and vessels of plants. Being anxious to ascertain whether the bands exist at an early period, the author had recourse to the examination of a young undeveloped frond, about two weeks old, and he was much gratified by finding his previous suspicions fully confirmed; the cellules then being of a uniform transparency, presenting neither bands nor dots, but furnished with a distinct cytoblast or nucleus, which was found to have entirely disappeared from those cellules in which the incrustating matter was visible, proving that the incrustating matter is formed at the expense of the nucleus. The matter forming the bands is continuous, and is evidently not formed by a coalescing of spiral fibres, as some might suppose; for it is perfectly solid, and shows no disposition to unroll or to break up into fibres. The bands most probably originated from the shrinking up of the incrustating substance, which at first was equally diffused in a fluid state over the walls, and which, from the mere effects of consolidation, aided by the distention, and perhaps enlargement of the cellule, would naturally leave portions of the primitive membrane uncovered. That the dotted and reticulated vessels in *Cycadeæ* are of the same nature, and originate in a similar way as the cellules just described, there seems no reasonable ground to doubt. The parenchymatous cellules in *Cycas circinalis*, *glauca*, and *speciosa* resemble those of *Zamia* and *Encephalartos* in having their walls of a nearly uniform thickness and transparency, being but rarely furnished with a few elliptical obliquely transverse spaces or dots. The cellules in *Cycas revoluta* vary both in size and structure, some being three or four times longer, whilst others are still longer and narrower, and furnished with more numerous and much smaller dots, which are not confined to the sides, but are disposed around the tube. These last, which have been observed also in *Cycas glauca* and *circinalis*, present an evident transition to the dotted vessels.

The whole of the *Cycadeæ* are supplied with numerous gummiferous canals, often of great length, and uniformly furnished with distinct cellular walls of considerable thickness, and which have been accurately described and figured by Professor Morren in a recent memoir.

Notwithstanding the analogies presented by their reproductive organs, the author considers the *Cycadeæ* as related to *Coniferæ* only in a remote degree, and that they constitute the remains of a class of plants which belonged to a former vegetation.

February 18.

The Lord Bishop of Norwich, President, in the Chair.

The Rev. George Isherwood, of Old Windsor, was elected a Fellow of the Society.

Mr. George T. Fox, F.L.S., exhibited a specimen of the *Phrynosomea cornutum* (*Agama cornuta* of Harlan) from Texas.

Mr. Cameron, A.L.S., presented a specimen of a new fern (*Cibotium Baromez*, J. Sm.) which has lately borne fructification, for the first time in this country, in the garden of the Birmingham Horticultural Society. A description of the plant by Mr. Westcott accompanied the specimen. The fern has been cultivated for some years in the gardens as the *Agnus Scythicus* or Vegetable Lamb (*Polypodium Baromez*, Linn.), but whether identical with the plant of Linnæus is a question still undetermined, as there happens to be no specimen in his herbarium, and the description alone is too meagre to settle the point. Mr. Westcott is however in possession of a specimen of a fern collected in Mexico by Mr. Ross, which closely resembles the plant of the gardens, and should they prove to be identical, all doubt will be removed as to the claims of the present plant to be regarded as the *Baromez* of Linnæus, which is a native of China.

The following is Mr. Westcott's description of the species :—

Rhizoma densely clothed with yellow woolly articulated hairs. *Stipes* about 7 feet high, roundish, of a dark reddish brown colour, more or less covered with tufts of woolly hairs near the base, naked for about half its height : upper part flexuous from the point where the pinnæ commence. *Fronde* bipinnate ; *pinnæ* alternate, ovate-lanceolate, acuminate, smooth, under surface glaucous, upper surface dark green ; those pinnæ bearing the sori curved, the barren pinnæ straight ; *pinnula* pinnatifid, alternate, linear-lanceolate, acuminate ; upper ones decurrent ; lower ones shortly petiolate ; lobes oblong, sharply serrated, more or less truncated, acute ; margins somewhat revolute, lobes in the upper row of each pinnula somewhat larger than those of the lower row, and those nearest to the rachis in the upper row the largest of all. *Venation* in the barren pinnæ branched, in the fertile pinnæ simple ; veins alternate. *Indusia* pouch-like, coriaceous sessile, situated on the apex of a vein at the margin, and near the base of the lobe of the pinnula : dehiscence by a transverse

slit near the apex ; outer valve white, inner valve brown, and forming a persistent operculum or lid. *Thecæ* roundish, stipitate, half surrounded by an articulated ring. *Sporules* numerous, angular.

Read, " Observations on a certain Crystalline Matter found on the recently cut surfaces of the Wood of the Red Cedar." By Edwin J. Quekett, Esq., F.L.S.

Mr. Quekett remarked, that on the recently cut surfaces of the wood of the Red Cedar (*Juniperus virginiana*) a crystalline matter is observed to form, which puts on the appearance of a mouldiness, but which, when viewed with a magnifying glass, is seen to consist of innumerable extremely minute crystals of an acicular form. The substance was observed to form on the duramen or heart wood only, and not universally, but in patches. It is easily volatilized by heat, and gives out the well-known odour of the wood. Mr. Quekett showed that the duramen of the red cedar contains an abundance of a concrete volatile oil, on which the peculiar odour depends, and that the crystalline substance is a compound formed between the air and the oil, for when the latter was obtained from the wood, and exposed to the action of the air, it was soon also found to be covered with the same acicular crystals. This substance, which possesses many of the properties of benzoic acid, Mr. Quekett considers new, and he proposed for it the name of Cedarine.

March 3.

Mr. Brown, V.P., in the Chair.

Mr. Francis Boyle Garty, of Camberwell, and the Rev. William Strong Hore, M.A., of Devonport, were elected Fellows ; and Mr. Frederick John Bird, of Wilmington Square, was elected an Associate of the Society.

Mr. Ward, F.L.S., exhibited a specimen of the *Agnus Scythicus*, or Vegetable Lamb, from the collection of the Apothecaries' Company.

Read, " A Note on the Fern known as *Aspidium Baromez*." By Mr. John Smith, A.L.S.

This plant, of which a description by Mr. Westcott was read at the preceding Meeting, and of which an abstract has been given,

was shown by Mr. Smith to be a legitimate species of the genus *Cibotium*, with which it agrees in the venation of its frond, the disposition of its sori, and in the structure and texture of its indusium.

March 17.

Mr. Forster, V.P., in the Chair.

William Ifill, M.D., of Welbeck Street; Edwin Lankester, M.D., of Campsall Hall, near Doncaster; and Lieut. William Munro, of Her Majesty's 39th regiment of foot, were elected Fellows of the Society.

The following addresses of congratulation to Her Majesty and to His Royal Highness Prince Albert of Saxe Coburg and Gotha, on occasion of Her Majesty's marriage, were read from the Chair, and unanimously adopted by the Meeting, viz.

“ To the Queen's most Excellent Majesty.

“ The humble Address of the President, Council, and Fellows of the Linnean Society of London.

“ Most Gracious Sovereign,

“ We, Your Majesty's most dutiful and loyal subjects, the President, Council, and Fellows of the Linnean Society of London, beg leave to approach Your Majesty, humbly to offer our heart-felt congratulations on the joyful occasion of Your Majesty's nuptials with His Royal Highness Prince Albert of Saxe Coburg and Gotha.

“ Deeply impressed with feelings of loyalty and devotion towards Your Majesty, we hail this auspicious event as an assurance of lasting happiness to Your Majesty, and of permanent blessings to the British Empire, and we most fervently implore the blessings of Almighty God upon Your Majesty, that through His mercy and goodness He may be pleased to extend His watchful care over the lives and the happiness of Your Majesty and Your Majesty's Royal Consort.”

“ To His Royal Highness Prince Albert of Saxe Coburg and Gotha.

“ The humble Address of the President, Council, and Fellows of the Linnean Society of London.

“ May it please Your Royal Highness,

“ We, the President, Council, and Fellows of the Linnean Society of London, beg leave humbly to present to Your Royal High-

ness our cordial congratulations on the happy occasion of Your Royal Highness's marriage with Her Majesty our gracious Queen and Patron.

“ We hail this auspicious event as equally promoting the happiness of Her Majesty and the best interests of Her Majesty's affectionate and loyal people, and we most devoutly implore the blessings of Almighty God on Your Royal Highness, that He through His goodness and mercy may be pleased to extend His watchful care over the lives and happiness of our beloved Sovereign and Your Royal Highness.”

Read “ On some new Brazilian Plants allied to the Natural Order *Burmanniaceæ*.” By John Miers, Esq., F.L.S.

Of the thirteen recorded species of *Burmattia* five are natives of Brazil, where they were found by Von Martius, who has not only accurately described them, but has given an able detail of the genus. The author, previous to his departure from Brazil, discovered five new plants, evidently allied to *Burmattia*, but which differ in many essential characters: from these he has established three new genera, *Dictyostega*, *Cymbocarpa*, and *Stemoptera*: they possess the habit of *Burmattia* in their thickened rhizoma with branching fibres, an erect stem, almost naked, or furnished with a few distant bractiform leaves and terminal flowers, with a tubular petaloid perianthium, having a six-partite border, composed of three sepals and three petals; stamens three, almost sessile, in the mouth of the tube below the petals; anthers with the cells disjoined and opening transversely; a simple style; three stigmata and a capsule surmounted by the withered perianth bursting irregularly; seeds minute, resembling those of *Orchideæ*; but the most important difference consists in their having unilocular capsules, with three parietal placentæ, while *Burmattia* has always a trilocular capsule, with central placentation, an essential difference, which entitles them to be considered, if not as forming a new natural order, at least as constituting a distinct sub-family. Allied to these are to be arranged three other plants, already recorded, the *Apteria setacea* of Nuttall, a native of North America, and *Gonyanthes candida* and *Gymnosiphon aphyllum* of Blume, by whom they were found in Java. The author considers his genus *Dictyostega* as coming very near *Apteria*, which, however, from the drawing and description of Mr. Nuttall, would seem to resemble *Stemoptera* still more closely in its habit, its seeds, and its large single flowers; but it does not appear to possess the very

remarkable stamens of the latter genus, nor the habit or singular seeds of *Dictyostega*. He gives a full description of the characters of his new genera and species, adding at the same time the character of *Apteria* and of Dr. Blume's two genera, so as to collect all the evidence yet known respecting the order of *Burmanniaceæ*. Of the genus *Dictyostega* he describes three species, which he found in Brazil, to which is to be added a fourth species, discovered by Mr. Schomburgk in British Guiana.

The following are their characters :—

DICTYOSTEGA.

Perianthium tubulosum, ovario adnatum, supernè liberum : limbo 6-fido, laciniis 3 alternis minoribus. *Stamina* 3 : filamentis brevissimis : antheræ loculis disjunctis, transversim dehiscentibus. *Stylus* simplex. *Stigmata* 3. *Capsula* 1-locularis, sub 3-valvis, polysperma, apice dehiscentis : valvis medio placentiferis. *Semina* minuta, scobiformia, testâ laxâ, reticulatâ, pertranslucidâ, nucleo quintuplò longiore vestita.

Plantæ (brasilienses) *rhizocarpeæ*, radice fibrosâ, squamis membranaceis, imbricatis, ciliatis, incanis tectâ. Caulis erectus, subflexuosus, pallidè purpurascens, subsolitarius, rariùs ramiferus, et tunc ramis 1—3 erectis, alternis, trunco consimilibus. Folia bracteiformia, subsessilia, adpressa. Inflorescentia terminalis, dichotomè racemosa, vel subumbellato-cymosa, floribus purpurascens, pedicellatis.

1. *D. orobanchioides*, caule erecto simplici vel ramifero, racemis geminis, floribus nutantibus unibracteatis, bracteis cum pedicellis alternantibus, capsulâ subvalvatâ ecostatâ longitudinalitèr dehiscente.—Monte Corcovado, Rio de Janeiro.
2. *D. umbellata*, caule erecto simplicissimo, foliis erecto-patulis, umbellâ simplici 6—9-florâ, floribus erectis, pedicellis basi bracteatis, ovario ecostato.—Serra dos Orgãos, Prov. Rio de Janeiro.
3. *D. costata*, caule erecto simplici, floribus erectis, cymâ bibracteâtâ, pedicellis ebracteatis, capsulâ evalvi 6-costatâ apice dehiscenti.—Rio de Janeiro.
4. *D. Schomburgkii*, caule erecto subsimplici, racemis geminis paucifloris, floribus unibracteatis, bracteis pedicello oppositis, perianthio medio haud constricto, laciniis obtusioribus, capsulâ 6-costatâ apice dehiscenti.—Guiana.

CYMBOCARPA.

Perianthium tubulosum, ovario adnatum, supernè liberum : limbo 6-fido, laciniis tribus alternis minoribus. *Stamina* omninò *Dictyostegæ*. *Stylus* simplex. *Stigmata* 3-loba, lobis gibboso-rotundatis, cornubus 2

subulatis erectis instructis. *Ovarium* gibboso-3-gonum, 1-loculare, placentis 3 parietalibus. *Capsula* 1-locularis, latere unico angulo superiore tantùm dehiscens. *Semina* scobiformia, numerosissima, testâ reticulatâ nucleo vix excedente.

Plantæ (brasilienses) *rhizocarpeæ*, radice fibrosâ. Caulis simplex, subflexuosus, erectus, albescens. Folia sessilia, bracteiformia, erecta, aut adpressa. Inflorescentia dichotomè spicata, pauciflora, floribus flavescenti-albidis, basi bracteatis, cum pedicellis brevissimis summo abruptè declinatis geniculatis.

1. *Cymbocarpa refracta*.—Monte Corcovado, Rio de Janeiro.

STEMOPTERA.

Perianthium ovario adnatum, suprâ liberum, subinfundibuliforme : fauce turgidâ sacculis 3 interioribus auctâ : limbo 6-partito, laciniis acutis, æstivatione marginibus induplicatis, 3 alternis brevioribus. *Stamina* 3, fauci adnata : filamentis complanatis, è margine sacculorum orientibus bifurcatis, ramulo singulo antherifero alato. *Ovarium* turbinatum, 1-loculare, placentis 3 parietalibus. *Stylus* longitudine staminum. *Stigmata* 3, recurvata, apice glandulifera. *Capsula* 1-locularis, polysperma, subtrivalvis, apice 3-fisso dehiscens. *Placentæ* 3, parietales. *Semina* numerosissima, scobiformia, testâ nucleo vix excedente, reticulatâ, areolis elongatis obliquè dispositis.

Plantæ (brasilienses) *rhizocarpeæ*, radice fibrosâ. Caulis erectus, subdichotomè ramosus, ramis subflexuosis, pallidis, subpurpurascensibus. Folia pauca, sessilia, erecta, bracteiformia, pallida. Inflorescentia terminalis, uniflora. Flores cæteris majores, ebracteati, purpurascens, Apertiæ Nutt. haud absimiles.

1. *Stemoptera lilacina*.—In uliginosis ad Serra dos Orgãos Prov. Rio de Janeiro.

All the species are described at length in the paper, and their characters are further illustrated by drawings, with details of the parts of fructification. The author remarks, that upon the same principle that *Apostasiaceæ* have been separated from *Orchideæ*, and *Xyrideæ* from *Restiaceæ*, these plants ought to constitute an order distinct from *Burmanniaceæ*; but the difference between the unilocular capsule with parietal placentation and the trilocular capsule with axile placentation, which at first sight seems to offer a wide and well-founded distinction, appears of less value when we consider that the extensive order *Gentianeæ* presents similar differences, together with every possible gradation of transition from one extreme to the other. He therefore inclines to the view of preserving all

within the natural order *Burmanniaceæ*, dividing it into two sub-families, viz. 1. *Burmanniæ*, which will contain only the single genus *Burmannia* (and perhaps the *Gonyanthes* of Blume may be found to belong also to this section); 2. *Dictyostegæ*, comprising *Dictyostega*, *Cymbocarpa*, *Stemoptera*, *Apteria*, *Gonyanthes*, and *Gymnosiphon*. He then proceeds to show the close affinity which *Burmanniaceæ* bear to *Orchideæ*, which often also present nearly a naked stem, with imperfectly developed leaves, and instances are moreover known in which they exhibit three distinct stamens and three stigmata: they have also an unilocular ovarium, with parietal placentation; there exists also a close resemblance in the structure of the walls of the capsule, and there is hardly any difference in the shape and structure of the seeds of *Dictyostega* and some species of *Pleurothallis*, which have both a transparent reticulated testa, showing distinctly the included nucleus suspended from the apex. The pollen of these plants also bears much resemblance to that of *Orchideæ*, in being inclosed in a peculiar anther-case, and consisting of coarse grains cohering in waxy masses. *Dictyostega orobanchioides* also offers a beautiful illustration of the emission of pollen tubes, which are seen penetrating the stigmata in crowded bundles of cottony filaments, each thread being clavately terminated by its respective grain of pollen.

There was also read a paper, entitled, "On the existence of Spiral Cells in the Seeds of *Acanthaceæ*." By Mr. Richard Kippist. Communicated by Prof. Don, Libr. L.S.

After briefly enumerating the other natural families in whose seeds spiral cells had been previously observed, the author proceeds to describe those of a plant brought from Upper Egypt by Mr. Holroyd (*Acanthodium spicatum*, Delile), whose peculiar appearance when placed under the microscope, first led him to examine those of other *Acanthaceæ*, in which family the existence of spiral cells had not before been noticed. The entire surface of the seed in *Acanthodium* is covered with whitish hairs, which are appressed, and adhere closely to it in the dry state, being apparently glued together at their extremities. On being placed in water, these hairs are set free, and spread out on all sides, they are then seen to be clusters of from five to twenty spiral cells, which adhere firmly together in their lower portions while their upper parts are free, separating from the cluster at different heights, and expanding in all directions like plumes, forming a very beautiful microscopic object. The free portions of the

cells readily unroll, exhibiting the spire formed of one, two, or occasionally of three fibres, which may sometimes be seen to branch, and not unfrequently break up into rings. Throughout the whole length of the cell the coils are nearly contiguous; in the lower part they are united by connecting fibrils, and towards the base of the adherent portion become completely reticulated. The testa is a semitransparent membrane formed of nearly regular hexagonal cells, whose centre is occupied by an opaque mass of grumous matter. Those cells which surround the bases of the hairs are considerably elongated, and, gradually tapering into transparent tubes, appear to occupy the interior of the spiral clusters. Some of these appearances were noticed by Delile, who described the *Acanthodium* in the splendid work on Egypt, published by the French Institute, where also a slightly magnified figure of the seed will be found, but without representing the spiral cells, which Delile does not appear to have detected.

Two species of *Blepharis* are mentioned as possessing a structure very similar to that of *Acanthodium spicatum*, differing chiefly in the smaller and more uniform diameter of the spiral cells, and in their thicker fibre, which is always single and loosely coiled.

The seed of *Ruellia formosa* on being placed in water develops from every part of its surface single short thick tapering tubes, within which in some cases a spiral fibre is loosely coiled; whilst in others the place of the spiral fibre is supplied by distant rings.

In the seeds of *Ruellia littoralis*, *Phayloopsis glutinosa*, and *Barleria noctiflora*, the whole surface becomes covered with separate tubes, very similar in form, but destitute of spiral fibre, and terminating in a minute pore, from which streams of mucilage are discharged.

Those of several species of *Barleria*, *Lepidagathis*, &c. are entirely covered with long tapering simple hairs, which expand in water, and like the rest are enveloped in a thick coat of mucilage.

In all the foregoing species the hairs occupy the entire surface of the seed, and are usually directed towards its apex, though they occur often most abundantly at the edges; in others they are only found attached to a marginal ring of a different texture from the rest of the seed. This is the case in *Strobilanthus lupulina*, *Blechum Brownii*, and *Ruellia secunda*. The seeds of many plants of this family are wholly destitute both of spiral cells or of any other appendages possessing hygroscopic properties, such for example as *Acanthus mollis* and *ilicifolius*, *Dipteracanthus erectus*, and several species of *Justicia* and *Eranthemum*.

April 7.

Mr. Forster, V.P., in the Chair.

The Rev. John Berrington, A.M., of Kingston, Surrey, and Sigismund Rucker, Jun., Esq., of Wandsworth, were elected Fellows; and Mr. Henry Letheby, of Pentonville, was elected an Associate of the Society.

Dr. Farre, F.L.S., exhibited specimens of a singular form of gall on the leaves of a species of oak from Mexico. The gall consisted of an aggregation of hollow cylindrical tubes, nearly an inch in length, and furnished with a fringed orifice. The tubes were remarkable for their elegance and uniformity; their colour was white, suffused with red, especially towards the apex.

Mr. Yarrell, F.L.S., exhibited a specimen of a satin-like mass of *Conferva fluviatilis*, which grew in a water meadow near Totness. A spring, which flows only in winter, rises in the meadow, and this substance is taken from narrow gutters, from one of which, twelve inches wide, a piece was taken up which measured seventy-nine feet in length, so firm and tough was its consistence; and another piece broke off at thirty-nine feet. In consistence and appearance it bore considerable resemblance to a piece of cotton wadding, but of a firmer texture. A portion was carefully examined under the microscope, and found to consist entirely of an interwoven mass of filaments of *Conferva fluviatilis*. The plant was compared with the authentic specimen of that species preserved in the Linnæan Herbarium, and was seen to differ only in the greater length of the articulations. The under surface of the mass was of a bright green colour, but the upper surface was white from the effects of direct exposure to the air and light, which had caused the death of the plant at that part.

Read, a continuation of Mr. Smith's "Arrangement of the Genera of Ferns."

April 21.

The Lord Bishop of Norwich, President, in the Chair.

Read, a paper by John Blackwall, Esq., F.L.S., entitled "The Difference in the Number of Eyes with which Spiders are provided, No. VIII.—PROCEEDINGS OF THE LINNEAN SOCIETY.

proposed as the Basis of their distribution into Tribes; with the characters of a new Family and three new Genera of Spiders.”

Mr. Blackwall begins by stating his objections to the bases of arrangement adopted by MM. Walckenaer and Dufour in the subdivision of the order *Araneidea*, and proceeds to give his reasons for preferring a division founded on the number of eyes; in conformity with which he proposes three tribes, viz. 1. *Octonocolata*; 2. *Senoculina*; 3. *Binoculina*.

In the first tribe he proposes three new genera, two of them belonging to a family which he characterizes under the name of *Cinifloridæ*: these genera he also characterizes under the names of *Ciniflo*, founded on the *Clubiona atrox* of Latreille, and *Operaria*, comprising the *Theridion benignum*, Walck., *Drassus exiguus*, Blackw., and *Drassus viridissimus*, Walck. The third genus characterized by Mr. Blackwall, is referred by him to the family of *Agelenidæ*, under the name of *Cavator*: it is founded on the *Clubiona saxatilis*, Blackw.

May 5.

The Lord Bishop of Norwich, President, in the Chair.

Read, “Additional Observations on some Plants allied to the natural order Burmanniaceæ.” By John Miers, Esq., F.L.S.

These observations have reference chiefly to the relative position of the parts of the flower in the tribe of plants above-mentioned. The author remarks, that the stamina, placentæ, and stigmata in these plants, are disposed in the same line, and opposite the inner series of the perianthium. The placentæ are always invariably double; and the stigmata in such cases as the present are to be regarded as being made up of the confluent margins of the two adjoining carpel-leaves, as suggested by Mr. Brown in his learned Memoir on *Cyrtandrea* lately published.

May 25.

The Lord Bishop of Norwich, President, in the Chair.

This day, the Anniversary of the birth-day of Linnæus, and that appointed in the Charter for the election of Council and Officers;

the President opened the business of the meeting, and in stating the number of Members whom the Society had lost during the past year, gave the following notices of some of them :—

George, Duke of Marlborough, one of the Honorary Members, was distinguished for his botanical taste, and for his zeal in the cultivation of exotic plants ; and the magnificent collection formed by him at White Knights was long one of the finest in this country, both in regard to its extent, and the rarity and beauty of the specimens. His taste for Botany continued unabated to the last, and the collection established afterwards at Blenheim was chiefly cultivated under his own immediate superintendence.

John Bartlet, Esq.

John, Duke of Bedford, K.G.—This amiable and accomplished nobleman was a most munificent patron of the arts and sciences in general, and especially of Botany, in the cultivation of which he took great delight. We are indebted to him for several splendidly illustrated works, abounding in valuable practical remarks, on particular tribes of plants, of which he had formed extensive collections at his magnificent seat of Woburn Abbey.

William Beetham, Esq.

William Christy, Jun., Esq.—Few persons cultivated Botany and Entomology with more ardour than Mr. Christy, who, to the regret of his friends, and to the loss of science, was cut off at an early age. His zeal and success in the pursuit of science were only equalled by his readiness and liberality to impart to others a portion of the stores which he had collected. He had formed an extensive Herbarium of British and Foreign Plants, and for that purpose had made several extensive tours in the British Isles, and had also visited Madeira and Norway. His collection of dried plants, and books on Botany, he gave to the Botanical Society of Edinburgh, of which he was one of the institutors.

Lord Charles Spencer Churchill.

Richard Cotton, Esq.

Allan Cunningham, Esq.—This eminent botanist and traveller was born in the beginning of the year 1791, at Wimbledon, where his father (who was a native of Ayrshire) held the situation of gardener. His father took great pains with his education, and placed him, along with his younger brother, Richard, at an excellent academy at Putney, then conducted by the Rev. Mr. Adams. About the year 1808 both brothers were engaged in the office of the Royal Botanic Gardens at Kew, at the period when the second edition of the '*Hortus Kewensis*' was passing through the press. In the autumn of

1814, having been appointed a Botanical Collector for the Royal Gardens, he left England, in company with Mr. James Bowie (who had also received a similar appointment), for the Brazils, where they remained two years, and among many other plants transmitted by them, were *Gloxinia speciosa*, *Cereus speciosissimus*, *Jacaranda mimosifolia*, and *Calathea zebrina*, then new to the Gardens. The two companions now separated, Mr. Bowie having received instructions to proceed to the Cape of Good Hope, and Mr. Cunningham to New South Wales, where he arrived in 1817, and shortly after joined the expedition into the interior of that colony, under Mr. Oxley, the Surveyor-General. On his return to Sydney he embarked as botanist in the voyage of survey under the command of Lieutenant, now Captain Philip Parker King, of the Royal Navy. The survey continued four years, and during that period they circumnavigated Australia several times, and visited Van Diemen's Land, Timor, and the Mauritius, at all of which places Mr. Cunningham formed extensive collections. After the conclusion of these voyages, Mr. Cunningham made several journeys into the interior of New South Wales, and subsequently visited Norfolk Island and New Zealand, where he remained several months. The fruits of his researches in the latter country are given in the 'Companion to the Botanical Magazine,' and 'Annals of Natural History.' After an absence of seventeen years, Mr. Cunningham returned to his native country, and continued to reside in the vicinity of Kew, until the melancholy tidings arrived of the death of his brother Richard, whom he was appointed to succeed in the quality of Colonial Botanist in New South Wales, where he again arrived in February 1837. In the following year he revisited New Zealand, and remained there during the whole of the rainy season, which produced serious effects upon a constitution already greatly debilitated, and on his return to Sydney his health visibly declined until the period of his death, which took place on the 27th of June last, at the age of 48. He was distinguished for his moral worth, singleness of heart, and enthusiastic zeal in the pursuit of science.

Davies Gilbert, Esq., F.R.S.—Mr. Davies Gilbert was distinguished by his high attainments in science and literature, his simple and gentle manners, and his amiable purity of heart. He was the son of the Rev. Edward Giddy, and was born on the 6th of March, 1767, at St. Erth, in Cornwall.

Davies Giddy was a child of early intellectual promise, but his health was feeble, and he received not only the rudiments, but almost the whole of his education under the paternal roof, guided and

assisted by a father whose classical learning was of a high order. For about a twelvemonth he was placed under the tuition of the Rev. James Parken, Master of the Grammar School at Penzance, to which town his family removed for that purpose; but he soon returned to Tredrea, which was long afterwards his favourite abode, to pursue his studies in a manner more congenial to his feelings. He had by this time formed a taste for mathematical investigations, in which he was aided by the knowledge, freely and kindly imparted, of the Rev. Malachi Hitchens of St. Hilary, a man whose name is well known and respected by practical astronomers. In the year 1782 he removed with his family to Bristol, and continued to cultivate the severer sciences with undiminished ardour. On the 12th of April, 1785, he entered as a Gentleman Commoner of Pembroke College in the University of Oxford, and soon attracted the notice of many of its Professors and Senior Residents. He resided pretty constantly there from his matriculation, except during the long vacations, till the year 1789, when he became an Honorary Master of Arts, but still continued to make long visits to his old College.

In November, 1791, he became a Fellow of the Royal Society, and formed a connexion with Dr. Maskelyne, Sir Joseph Banks, Mr. Cavendish, and other eminent members of that body, which terminated only with their lives. Though the sciences dependent on and connected with mathematics were the chief objects of his early studies, he was far from inattentive to the claims of Natural History on a portion of his leisure. He cultivated chiefly that branch of it which embraces the vegetable kingdom; and an acquaintance formed in Cornwall with Dr. Withering, as well as his friendship with Dr. Beddoes and Dr. Sibthorp at Oxford, contributed to the same end. He became a Fellow of the Linnæan Society in 1792, in which year he also served the office of Sheriff for his native county. In the year 1804 he was chosen one of the representatives of the borough of Helston, and in 1806 was returned in a new Parliament for that of Bodmin. In this seat he continued till the year 1832, when he ceased to be a member of the legislature. During the whole time of his continuance in Parliament, he was the encourager and indefatigable supporter of every measure connected with the advancement of science; and by his representations and exertions many services were rendered to various scientific societies and institutions, in promoting whose prosperity and usefulness he was incessantly and zealously occupied. He took a prominent part in the inquiry relating to the currency, and published in 1811 a plain statement of the bullion question; and he was also very

active both in the House of Commons and out of it in the arrangement of the standard of weights and measures.

In 1806 he married Mary Anne Gilbert, and in 1817 he assumed the name of her family, in pursuance of the injunction contained in a will of her uncle, Charles Gilbert, Esq., of Eastbourne, in Sussex. By this marriage he had seven children, of whom only four survived him; John Davies Gilbert, Esq., the present Sheriff of Sussex, and three daughters.

He became a Fellow of the Society of Antiquaries in 1820, and was likewise Fellow of the Astronomical and Geological Societies. He continued to perform the office of Treasurer of the Royal Society, till in 1827 he became President of that distinguished body. In the year 1831 he retired from the chair, and was succeeded by His Royal Highness the Duke of Sussex. In 1832 he received from the University of Oxford the Degree of Doctor of Laws, by Diploma.

His last visit to his native county took place in 1839. On leaving Cornwall he came through Exeter and Oxford to London, and returned after a few days to Oxford. This last journey, which was attended by some untoward circumstances, was too much for his sinking strength. On his return to London he fell into a state of lethargy, from which, though he was enabled to reach his home, he never fully recovered, but after lingering in this state for some time, he expired, on the 24th of December, 1839, and in the 73rd year of his age.

The Rev. Joseph Goodall, D.D., Provost of Eton College.—Dr. Goodall was ardently devoted to the study of Natural History, but more especially to Conchology, with which science he was thoroughly acquainted, and his collection in that department was regarded as one of the most valuable in this country. He was ever a warm and zealous friend of this Society.

The Reverend Patrick Keith.—Mr. Keith long and successfully cultivated the interesting department of Vegetable Physiology, to which he published an Introduction in 1816, under the title of ‘System of Physiological Botany,’ in two volumes, 8vo. The work contained the fullest and best account of the subject at that time in the English language, and was, moreover, enriched by numerous original remarks. Mr. Keith was likewise the author of a Botanical Lexicon, published in 1837, and three separate Memoirs, printed in the 11th, 12th and 16th volumes of the Society’s Transactions; the first on the Formation of the Vegetable Epidermis, the second on the Development of the Seminal Germ, and the third on the Origin of Buds. Several papers on botanical subjects, from

the pen of Mr. Keith, occur also in the Philosophical Magazine and Annals of Natural History.

Mr. Keith had long been suffering from severe illness, which terminated in his death on the 25th of January last, at the age of 71, at the parsonage of Stalisfield, in Kent, of which parish he had been for many years vicar. He was a native of Scotland, and received his education at the University of Glasgow.

William Kent, Esq.—Mr. Kent was a zealous botanist and horticulturist, and formerly possessed an extensive garden at Clapton, where, among many other choice plants, he successfully cultivated the beautiful *Nelumbium speciosum*, and other tender aquatics, of which he was a liberal distributor to his friends. His health obliging him to retire to Bath, he lost the means of indulging his inclination to horticulture on so large a scale; but of his garden on Bathwick Hill, it might truly be said that there never perhaps were so many rare plants cultivated together in so small a space. Notwithstanding he laboured under a painful complaint, he was also happily able to amuse himself by landscape painting; and at the same time he was ever active in promoting useful institutions, moral, scientific or literary.

Don Mariano Lagasca, Professor of Botany, and Director of the Royal Botanic Garden at Madrid, was a native of the province of Arragon, where his father followed the occupation of a farmer. He was sent at an early age to the Gymnasium of Tarragona, and after pursuing the course of study prescribed at that institution, he repaired to Madrid to complete himself for the medical profession, for which he had evinced a predilection. At Madrid he had the good fortune to attend the lectures, and to acquire the friendship, of the celebrated Cavanilles, at that time Professor of Botany in the Spanish capital, and these circumstances laid the foundation of the eminence to which he afterwards attained. In 1822, on the assembling of the Cortes, he was returned Deputy for his native province, and on the overthrow of the constitutional form of government in November of the following year, he was obliged to consult his safety by flight, first to Gibraltar, and afterwards to this country, where his high moral character, amiable disposition, and eminent talents, gained him universal esteem and respect.

Spain, long famed as the granary of ancient Rome, is known to surpass all other countries in the great variety of those grasses which are cultivated for human food, such as wheat, barley, rye and oats: and many of those whom I am now addressing may remember the extensive and interesting collection of Spanish *Cerealia* cul-

tivated by Professor Lagasca in the garden belonging to the Society of Apothecaries at Chelsea. The publication of a 'Ceres and Flora Hispanica' had long been a favourite object with him, but which he did not live to accomplish. He departed this life in the 58th year of his age, on the 23rd of June last, at the palace of his early friend and school associate, the present Bishop of Barcelona, who hearing of his infirm state of health, had invited him to partake of his hospitality and kindness, in the hope that the milder air of Catalonia might be the means of restoring him. His remains were honoured with a public funeral, and an oration was pronounced over him by his friend Don Augustin Yanez, Professor of Natural History at Barcelona.

It was in Systematic Botany that Professor Lagasca had more particularly distinguished himself, and he has added greatly to our knowledge of various families of plants, such as *Umbelliferae*, *Dipsacæ* and *Compositæ*, of one of the groups of which, the *Labiatifloræ*, he may be regarded as the founder.

James Dottin Maycock, M.D.—Dr. Maycock is deserving of notice as the author of a Flora of Barbadoes, in which island he had long resided. The work forms a catalogue of the indigenous as well as cultivated plants of that island, and contains besides a number of interesting notices on their æconomical uses. The author has fully established the identity of the species which affords the Barbadoes aloes, with the *Aloe vulgaris*, accurately figured in the 'Flora Græca.'

William Mills, Esq.

Sir John St. Aubyn, Bart., F.R.S.—A distinguished cultivator of the science of Mineralogy, and who possessed one of the most extensive and valuable collections in that department of Natural History ever formed in this country.

James Sharpe, Esq.

The Rev. Thomas, Lord Walsingham.

Amongst the Foreign Members occur—

John Frederick Blumenbach, M.D., Professor of Medicine in the University of Göttingen, Foreign Member of the Royal Society of London, and Associate of the Royal Academy of Sciences of the French Institute, was pre-eminently distinguished by his important researches in General Anatomy and Physiology, which he continued to prosecute during a long life ardently devoted to the advancement of science. He was equally remarkable for the extent and variety of his knowledge and the philosophical sagacity of his views. Professor Blumenbach died on the 22nd of January last, at the advanced age of 88.

Joseph Francis, Baron Jacquin, Professor of Botany and Chemistry, and Director of the Imperial Botanic Garden at Vienna, to which appointments he succeeded on the resignation of his father, the celebrated traveller and botanist. He was author of *Eclogæ Plantarum*, a folio work, containing descriptions and coloured figures of the new and rare plants which flowered in the gardens under his care, and also of a valuable work on birds.

Baron Jacquin was distinguished for his urbanity and kindness, especially to strangers; and few cultivators of science visited the Austrian capital without partaking of his good offices and hospitality. He died at Vienna, on the 10th of December, in the 74th year of his age.

The President also announced that seventeen Fellows and four Associates had been elected since the last Anniversary.

It was then moved by the President, and unanimously agreed to by the meeting; "That the cordial thanks of the Society be given to Dr. Boott on his retirement from the office of Secretary, for the incessant attention which he has shown to the duties of that office, and for the ability, zeal, and urbanity with which he has discharged those duties."

At the election, which subsequently took place, the Lord Bishop of Norwich was elected President; Edward Forster, Esq., Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out; viz. Thomas Bell, Esq., George Loddiges, Esq., Gideon Mantell, Esq., LL.D., Richard Horsman Solly, Esq., and Sir George Thomas Staunton, Bart.

June 2.

Mr. Forster, V.P., in the Chair.

William Felkin, Esq., of Nottingham, was elected a Fellow of the Society.

Mr. George Francis, F.L.S., exhibited a portion of the trunk of the *Lepurandra saccidora* (Graham, Cat. Bomb. Pl. p. 193.), from Western India, of the bark of which sacks and bags are made.

Mr. Rauch exhibited a specimen of the fruit of *Salisburia adiantifolia*, which was grown last year in the Imperial Botanic Garden at Vienna.

Read, "On the reproductive Organs of *Equisetum*." By Mr. Joseph Henderson, Gardener to Earl Fitzwilliam, at Milton Park, communicated by the Rev. M. J. Berkeley, F.L.S.

Mr. Henderson's observations were made on *Equisetum hyemale* and other species, and embrace the entire period of development of the sporæ and of the thecæ containing them. The theca is in the first instance filled with cells of extreme tenuity, in the interior of which the sporæ afterwards take their origin. After the appearance of the sporæ the containing cells gradually become thickened, and separate from each other; and at a still later period their walls are marked by spiral sutures, by means of which they are subdivided into two narrow bands with broad and rounded ends. As the sporæ approach maturity these bands separate at the sutures, and the containing cell is thus resolved into its component parts, the supposed filaments and antheræ of Hedwig. The sporæ, when ripe, have a double membrane, which is rendered evident by the addition of tincture of iodine. In the immature state of the thecæ, up to the time when the spiral lines become distinctly marked on the integument of the sporæ, they form transparent membranous reticulated bags, the meshes of which have different directions in different parts. When the sporæ have attained their full size, a new deposit of vegetable matter is added, and spiral vessels are formed within the flattened cells of which the membrane is composed, and the outlines of which are indicated by the meshes on the surface. In some situations these vessels are true spirals, in others they partake more of the character of the annular.

While making these observations, Mr. Henderson was not aware that he had been in part anticipated by Treviranus, Bischoff, Meyen and Mohl. They differ, however, in some particulars from the observations of those physiologists, who also differ from each other.

June 16.

The Lord Bishop of Norwich, President, in the Chair.

Thomas Harris, Esq., of Kingsbury, was elected a Fellow of the Society.

The President nominated the four following Members of the Council to be Vice-Presidents for the year commencing on the

25th of May last, viz. Robert Brown, Esq., Edward Forster, Esq., Thomas Horsfield, M.D., and Aylmer Bourke Lambert, Esq.

Read, "Descriptions of some new species of the Coleopterous genus *Cerapterus*." By J. O. Westwood, Esq., F.L.S.

In the present paper the author enumerates eight species of this interesting genus of the family of *Paussidæ*, which he distributes into six subgenera. The following are the characters of the new species:—

1. *C. Horsfieldii*, piceus; thorace anticè emarginato, clytris maculâ apicali flavescente haud rotundatâ literam y quodammodò simulante, palporum labialium articulo ultimo securiformi.
2. *C. quadrinotatus*, piceo-niger, nitidissimus; thorace (anticè viso) subemarginato, maculis duabus magnis ovalibus prope scutellum, alterisque duabus apicem versus majoribus anticè et posticè lobatis rufo-fulvis.
Long. corp. lin., lat. lin.
3. *C. piceus*, nitidus; antennis pedibusque rufo-piceis, punctis irregularibus minutissimis.
4. *C. brasiliensis*, fulvo-rufescens; oculis albidis tenuissimè punctatis, vertice depresso, thorace intra angulos posticos utrinque foveolato.
Long. corp. lin., lat. lin.

This remarkable species was discovered by Mr. Miers in the vicinity of Rio de Janeiro, and a drawing of the insect accompanies the present paper. Mr. Westwood regards it as the type of a new subgenus, which he names *Homopterus*.

5. *C. Westermanni*, rufo-piceus, haud nitidus; clytris nigris posticè cruce rufescente notatis basi bicostatis discoque longitudinalitèr subimpressis, apice rufescente.
Long. corp. lin., lat. lin.

Read also the conclusion of a paper, entitled "Arrangement and Definition of the Genera of Ferns, founded upon their venation, with examples of the species, and observations on the affinities of each genus." By Mr. John Smith, A.L.S.

The principles of the author's arrangement are similar to those proposed by Presl in his *Tentamen Pteridographiæ*, published at Prague in 1836, in which the venation of the frond (a character, the importance of which, combined with the relation of the sori to the veins, was first pointed out by Mr. Brown) is adopted as the basis of generic division. Mr. Smith states that his arrangement was completed before the work of Professor Presl had reached this country, and thinks that the coincidence of their views affords presumptive evidence in favour of the accuracy of the principles upon which their distribution of the species is founded. This extensive family,

or rather class, was divided by Mr. Brown into four very natural subfamilies. It is only with the first of these (*Polypodiaceæ*) that Mr. Smith has more particularly occupied himself in the present paper. The following are the names and characters of the tribes into which he has distributed the *Polypodiaceæ*.

Subfam. I. POLYPODIACEÆ, *R. Br.*

Sporangia globose, or oval, transparent, unilocular, pedicellate, or rarely sessile, opening transversely by the elastic property of a vertical, rarely oblique, articulated ring.

Tribe I. POLYPODIEÆ. Sori punctiform or elongated, destitute of a special indusium.

Examples.—*Polypodium, Sw. Grammitis, Sw. Hemionitis, L.*

Tribe II. ACROSTICHIEÆ. Sori amorphous, destitute of a special indusium.

Example.—*Acrostichum, L.*

Tribe III. PTERIDEÆ. Sori punctiform, or elongated transversely. Indusium lateral, attached exteriorly.

Examples.—*Pteris, L. Adiantum, L.*

Tribe IV. ASPLENIEÆ. Sori elongated, oblique. Indusium lateral, linear.

Examples.—*Asplenium, L. Diplazium, Sw.*

Tribe V. ASPIDIEÆ. Sori punctiform, intramarginal. Indusium orbicular and central, or reniform and lateral, and attached interiorly.

Examples.—*Aspidium, Sw. Nephrodium, Mich., R. Br.*

Tribe VI. DICKSONIEÆ. Sori marginal. Indusium lateral, attached interiorly, its free margin conniving with the indusifform margin of the frond, forming a calyciform bilabiate cyst.

Examples.—*Lindsæa, Dry. Davallia, Sm. Dicksonia, L'Hérit. Trichomanes, L. Hymenophyllum, Sm.*

Tribe VII. CYATHEÆ. Sori punctiform, intramarginal. Indusium calyciform, or wanting. Receptacle elevated.

Examples.—*Cyathea, Sm. Hemitelia, R. Br. Alsophila, R. Br.*

These tribes are again subdivided into minor groups, founded upon characters derived from the venation of the frond, the position of the sori, and the form of the indusium. *Notholæna* and *Ceratopteris* are referred to the first, *Ceterach* to the fourth, and *Onoclea* to the fifth tribes.

Nov. 3.

Mr. Forster, V.P., in the Chair.

George Stephens Gough, Esq., of Rathronan House, near Clonmel, and Captain D. McAdam, of the Royal Marines, were elected Fellows of the Society.

Mr. William Taylor, F.L.S., exhibited a sample of the oil obtained from the fruit of *Madia sativa*, grown at Aspoll Stoneham, near Ipswich.

Read, "A Note on the Bokhara Clover." By William Taylor, Esq., F.L.S.

Mr. Taylor obtained from Mr. Loudon a small parcel of seeds of the Bokhara Clover (*Melilotus arborea*), which was sown early in April, 1839. The plant proved to be biennial, and stood the winter well. On the 28th of April following, a part of the crop was cut down, the stems measuring 15 inches in height; and on the 28th of May, from the same piece of ground, a second crop was obtained, which had reached the height of 16 inches; a third on the 28th of June, 17 inches; a fourth in July, 16 inches; a fifth in August, 15 inches; and a sixth in September, measuring 14 inches. According to Mr. Taylor's calculation, the Bokhara Clover would yield from 20 to 30 tons of green herbage per acre, and from 2 to 3 tons of strong fibre, which appears capable of being manufactured into cordage.

The flowers are white and very fragrant, and the plant does not appear to differ specifically from the *Melilotus leucantha*, although regarded by DeCandolle as a distinct species.

There were also read, "Descriptions of some new Insects collected in Assam, by William Griffith, Esq., Assistant Surgeon on the Madras Medical Establishment." By the Rev. F. W. Hope, M.A., F.R.S., and L.S.

This paper contains a further selection of new insects from Mr. Griffith's Assam collection in the possession of Mr. Solly, an account of part of which has been already noticed at p. 42, and has since appeared in the Society's Transactions. The descriptions are accompanied by coloured figures. The species described belong chiefly to the group of *Lucanidæ*, and are as follows:—

LUCANUS.

1. *L. Forsteri*.

Long. unc. 2, lin. 11; lat. elytr. lin. 10.

Nigro-piceus; mandibulis valdè exsertis internè multidentatis ad basin dente valido suprâ et infrâ armatis, apicibus furcatis.

This species has been named in compliment to Edward Forster, Esq., Treas. and V.P.L.S.

2. *L. Rafflesii*.

Long. unc. 2, lin. 6; lat. lin. 8.

Niger, nitidus; mandibulis valdè exsertis ante apicem unidentatis, apicibus obtusis et obliquè truncatis.

This species is nearly related to *L. nepalensis*, but is of larger dimensions, and is extensively diffused over the eastern part of the Indian continent, occurring in Nepal, Bengal, and Assam.

3. *L. Spencei*.

Long. unc. 1, lin. 9; lat. lin. 6.

Ater; mandibulis exsertis basi robustis et unidentatis, apicibus furcatis.

4. *L. curvidens*.

Long. unc. 1, lin. 9; lat. lin. $6\frac{1}{2}$.

Niger; mandibulis exsertis intùs dente curvato valido ferè ad basin posito.

5. *L. bulbosus*.

Long. unc. 1, lin. 6; lat. lin. 6.

Nigro-castaneus; mandibulis exsertis dentibus bulbosis armatis, apicibus acutis.

6. *L. astacoïdes*.

Long. unc. 1, lin. 3; lat. lin. 4.

Castaneus; mandibulis exsertis intùs ad basin denticulatis denticulis nigricantibus, apicibus acutis.

7. *L. foveatus*.

Long. unc. 2; lat. lin. 6.

Castaneus; mandibulis valdè exsertis, apicibus acutis, dente ferè medio fortiori, aliisque 4 æqualibus ante apicem positis.

8. *L. omissus*.

Long. unc. 1, lin. 9; lat. lin. 6.

Castaneus; mandibulis valdè exsertis, apicibus acutis, dentibus 2 nigris subbasalibus, aliisque 4 subapicalibus.

9. *L. serricollis*.

Long. unc. 1, lin. 3; lat. lin. 6.

Ater, politus; mandibulis parùm exsertis sinuatis et punctatis.

10. *L. punctiger*.

Long. lin. $9\frac{1}{2}$; lat. lin. 4.

Ater; corpore punctato nitido, thoracis marginibus externis serratis, elytris suturâ parùm elevatâ glabrâ insignitis, tibiis 4 posticis unidentatis.

CHEIROTONUS.

Corpus oblongo-ovatum, crassum. *Antennæ* 10-articulatæ. *Thorax* elytris anticè angustior, lateribus subrotundis, valdè serrulatis. *Elytra* thorace latiora. *Pedes* robusti, armati, anticè longiores; *tibiis* externè irregularitèr dentatis: *tarsis* elongatis, articulis apice spinâ brevî armatis, unguibus bidentatis. *Tibiæ* 4 *posticæ* seriebus spinarum irregularibus armatæ.

1. *C. MacLeayii*.

Long. lin. 23; lat. lin. 13.

Æneo-viridis; thorace lateribus externè serrulatis et varioloso-punctatis, sulco longitudinali in medio dorso fortitè impresso, elytris nigro-æneis maculisque croceis insignitis.

The insect which forms the type of the above new genus, has been named in compliment to Mr. W. S. MacLeay. It forms, along with *Eucheirus* of Kirby, and *Protomacrus* of Newman, a small natural family, which has been termed by the author *Eucheiridæ*, and is regarded by him as related to the *Dynastidæ*, and constituting a link of connexion with the *Goliathidæ*.

LAMIA.

1. *L. Swainsoni*.

Long. unc. 1, lin. 4; lat. lin. 6.

Brunnea; thorace utrinque spinoso, dorso convexo in medio bulboso, elytris concoloribus albo-variegatis et ad basin nigro-tuberculatis.

This species, which has been named after Mr. Swainson, appears to constitute a subgenus related to *Euoplia*, described in the first part of the account of Assam Insects at p. 42.

MONOCHAMUS.

1. *M. beryllinus*.

Long. lin. 8; lat. lin. 3.

Cæruleo-beryllinus; antennis griseis, thorace utrinque spinoso elytrisque nigro-maculatis.

STIBARA.

Corpus Saperdæforme, crassum, robustum. *Caput* latum, antice ferè quadratum, posticè convexum. *Antennæ* corpore breviores, 11-articulatæ. *Thorax* robustus, nodosus, inermis. *Elytra* lata, thorace vix triplò longiora, apicibus abruptè truncatis, lateribus elevatis. *Pedes* femoribus incrassatis, tibiis robustis.

1. *S. tetraspilota*.

Long. lin. 10; lat. lin. 3½.

Aurantio-rubra; antennis oculisque nigris, thorace nodoso, elytris concoloribus, maculâ magnâ ovali nigrâ ad humeros positâ, apicibus nigris.

2. *S. trilineata*.

Long. lin. 9; lat. lin. 3.

Pallidè castanea; antennis albo-cinctis, thorace nodoso utrinque denticulato, elytris lineis 3 nigris insignitis, suturâ latiori, lateribus punctatis, punctis duplici serie ad disci medium fortissimè insculptis.

A new genus belonging to the *Saperdidæ*, to which family the *Lamia nigricornis* is also referrible, besides several other types of undescribed genera.

November 17.

Mr. Forster, V.P., in the Chair.

Mr. Janson, F.L.S., exhibited specimens of the *Neottia astivalis*, discovered in August last by himself and Mr. Branch, near Lyndhurst, Hampshire, being the first time it had been observed in England.

Mr. Ogilby, F.L.S., exhibited a specimen in flower of a new species of clover recently introduced from Cabul, remarkable for the quantity of herbage which it yields. The species is very nearly related to *Trifolium resupinatum*.

Read, "Description of *Aucklandia*, a new genus of *Compositæ*, supposed to be the *Costus* of Dioscorides." By Hugh Falconer, M.D., Superintendent of the Honourable East India Company's Botanic Garden at Saharunpore. Communicated by Dr. Royle, F.R.S. & L.S.

This interesting plant, the root of which, under the name of koot, forms an important article of Cashmeer commerce, is considered by Dr. Falconer as identical with the long-disputed *Costus* of the ancients, and his opinion appears to be borne out by the accordance of the root with the description given by Dioscorides, by the striking analogy of the Arabian synonym *koost* to its Greek and Cashmeer appellations, and also by the commercial history of the drug.

The roots, which are possessed of a strong aromatic and pungent odour, are collected in large quantities, principally for exportation to China, where they are held in high repute, as an aphrodisiac, and are also burnt as incense in the temples. The quantity annually collected varies from 10,000 to 12,000 khurvars (of 96 seers, or 192 lbs.), or about 2,000,000 lbs. weight. At Canton the price per cwt. is 2*l.* 7*s.* 5*d.*, while the cost at the depôt in Cashmeer is only 2*s.* 4*d.*

The plant is not held in much repute as a medicine by the Cashmeerians, who are only astonished at the estimation in which it is held in other countries; nor do they apply it to any other use than that of protecting bales of shawls from the attacks of moths: portions of the stem are, however, suspended from the necks of children to avert the "evil eye," and to expel worms.

The plant is regarded by Dr. Falconer as constituting the type of a new genus of *Cynarææ*, which he has named in compliment to the present Governor-General of India; and as it was discovered during

a journey in Cashmeer, commenced under Lord Auckland's auspices, and yields a valuable product, he regards the name as peculiarly appropriate. The *Aucklandia* is a gregarious plant, growing in great abundance on the moist open slopes of the mountains which surround the valley of Cashmeer, at an elevation of from 8000 to 9000 feet above the level of the sea, but like some other plants of that region, it is extremely local, being confined to the immediate vicinity of the valley. The genus is nearly related to *Saussurea*, and is stated to be chiefly distinguished by the rays of its feathery pappus being disposed in two rows, and cohering by twos or threes at the base. The following is the author's character of the genus:

AUCKLANDIA.

Capitulum homogamum. *Antherarum caudæ* lanato-plumosæ. *Pappi setacei lamellæ* biseriales, plumosæ, basi ternatim quaternatimve coherentes, in annulum deciduum concretæ. *Achenium* glabrum.

Herba *orgyalis*, radice perenni ramosâ crassâ, caule erecto simplici sulcato glabro folioso, foliis sublyratis margine setaceo-dentatis suprâ glabris atrovirentibus subtùs glaucescentibus venis puberulis, capitulis numerosis terminalibus aggregatis, floribus atropurpureis.

Sp. A. Costus.

December 1.

Mr. Forster, V.P., in the Chair.

Mr. Gould, F.L.S., exhibited a specimen of a nondescript Lizard from New Holland, remarkable for the extreme aculeation of its scales.

Mr. William Cumming presented specimens of *Lagurus ovatus*, *Briza maxima*, and *Mentha crispa*, which he stated that he had gathered in the vicinity of Saffron Walden, Essex.

Read, "On a White Incrustation on Stones, from the bed of the river Annan." By Edwin Lankester, M.D., F.L.S.

During a short stay which the author made last summer on the banks of the Annan, in Dumfries-shire, his attention was arrested by the appearance of the stones on the banks of the river. Wherever a mass of gravel was exposed to the air, the surface of the stones appeared covered with a white incrustation, as if they had been white-washed. This appearance was more or less general on all

the exposed banks, but was most evident on the stones nearest the water's edge. On examining the stones with a pocket-lens, their surface appeared covered with acicular crystals, and hence it was at first concluded that the incrustation arose from the crystallization of some salt abounding in the waters. On procuring, however, some stones from the water itself, they presented on their surfaces the filaments of a minute conferva, which appeared to be the source of the white crust; but as the existence of the conferva would not explain the crystalline appearance, it was examined under the microscope, and was found to proceed from minute acicular bodies about $\frac{1}{100}$ th of an inch long and $\frac{1}{2000}$ th of an inch broad, which were most of them arranged in a stellate form, although many were scattered in all directions. Running under the whole were the filaments of a minute conferva, on which the acicular bodies rested.

In Greville's Scottish Cryptogamic Flora, similar bodies are referred to the genus *Exilaria*, but Dr. Lankester describes the stellate arrangement of the aciculæ as giving to those examined by him a different character from *E. fasciculata*. Hooker, in his continuation of Smith's 'English Flora,' has placed Greville's name as a synonym of *Diatoma truncatum*, from which *D. fasciculatum* is believed not to be distinct.

In Ehrenberg's work on the *Infusoria*, these bodies are figured and described (p. 11. tab. xvii.) as Polygastric animalcules of the family *Bacillariæ*. The genus to which they belong is *Synedra*, and the species which they most closely resemble is the *Synedra Ulna*, which is characterized by being striated, with linear corpuscles, straight, truncated at the sides, flat on the back and belly, with the apex a little dilated as the individuals become aged. The bodies from the Annan are not striated, nor are their ends dilated, although they appear to be full-grown. The siliceous skeletons in which these little animals are invested account for their white appearance. Although similar bodies have been often described both as plants and animals, the author believes that no notice has been taken of their producing the phænomenon here described.

Read also, "Observations on the Genus *Derbe* of Fabricius." By John O. Westwood, Esq., F.L.S.

After noticing the recent memoirs by Messrs. Percheron and Boheman on this little-known Fabrician genus, and its very close relationship to *Otiocerus* and *Anotia* of Kirby, the author states that the Fabrician type of the genus, *D. hæmorrhoidalis*, is quite distinct from the group described as such by the two first-mentioned authors.

He accordingly restricts the generic name *Derbe* to the typical species, with the following characters :

DERBE. Rostrum ad medium abdominis extensum, articulo apicali minuto. Antennæ breviores. Oculi subrotundati. Alæ longiores, angustiores, costâ anticarum ante apicem incisâ, venis numerosis, longitudinalibus, in medio venis transversis conjunctis, medianâ ramos 10 longitudinales emittente; alæ posticæ venâ postcostali 4-fidâ.

In addition to the typical species and *D. nervosa*, Klug, Burm., the author adds the two following species to the typical group :

1. *D. semistriata*, luteo-fulva; alis pallidis costâ magis fulvescenti venis nigricantibus strigisque tenuibus fuscis inter venas (nisi in cellulis apicalibus) dispositis. Expans. alar. lin. $16\frac{1}{2}$. Brasilia. Mus. Westw.
2. *D. strigipennis*, pallidè fusco-lutea; thoracis dorso carinâque faciei sanguineis, alarum venis fuscis, strigis tenuibus fuscescentibus inter venas omnes ad apicem alarum carentibus, pedibus albidis. Expans. alar. lin. 14. Brasilia. Mus. Westw.

MYSIDIA. Rostrum ultra pedes posticos haud extensum. Antennæ mediocres. Oculi rotundati. Alæ breviores, latiores, pulverosæ; anticæ integræ, venis paucioribus, venâ medianâ ramos tres emittente, ramo medio bifido; posticæ venâ postcostali bifidâ aut trifidâ.

The variation in the position and number of the veins of the wings affording a character of primary importance for distinguishing the preceding groups, the author has at some length entered into an examination of their normal state and direction, and the manner in which they become modified. The following species are referred to this subgenus: *Derbe pallida*, Fab., (described and figured by Percheron from the Copenhagen Cabinet as the type of the genus,) *D. squamigera*, Fab., *D. costalis*, Fab., and probably *D. punctum*, Fab., *D. testacea*, Fab., and *D. nivea*, Fab., as well as the following new species :

M. albipennis, parva, tenera; alis albis, anticis puncto parvo ante medium costæ punctis nonnullis ad marginem internum venis transversis punctoque ante apicem nigris, lunulis parvis marginalibus fuscis. Expans. alar. lin. 8. Vera Cruz. Mus. Westw.

M. lactiflora, luteo-albida; vertice collarisque margine antico parùm sanguineis, hujus margine postico margineque postico tegularum albis, alis albis margine antico lutescente versus basin maculis tribus parvis maculâque majori ante apicem nigris. Expans. alar. lin. $12\frac{1}{2}$. Brasilia. Mus. Westw.

M. subfasciata, alba; alis fusco transversè nebulosis puncto ante apicem nigro ad basin areæ parvæ triangularis subapicalis, venis 4 transversis obscuris. Brasilia. Mus. D. Burchell, et Soc. Zool. Lond.

LYDDA. Rostrum brevius. Antennæ breves. Alæ anticæ valdè elongatæ, apice rotundatæ, directione venarum anomalâ; regione venæ medianæ minimâ, aut potiùs ejus rami in venæ postcostalis ramos transformati.

The type of this subgenus is *Derbe elongata*, Fab., from New Holland, in the cabinet of the Linnean Society.

ZEUGMA. Rostrum ultra basin pedum posticorum extensum. Antennæ rotundatæ. Ocelli obsoleti? Prothorax lateribus pro antennarum receptione concavo-dilatatis. Alæ anticæ oblongo-ovatæ, apice subtruncatæ, venis numerosis longitudinalibus; venâ postcostali ramos 3 posticè, medianâ tantùm tres emittente.

This subgenus is stated to be intermediate between *Derbe* and *Thracia* on the one hand, and *Mysidia* on the other. The only species is

Z. vittata, fulva; alis anticis flavidis vittâ latâ mediâ apicem versus deflexâ alterâque posticâ parallelâ apice vittâ abbreviatâ fasciâque tenui transversâ fuscis. In Mus. Soc. Linn.

THRACIA. Rostrum pectore longius. Antennæ capite ferè duplò longiores. Oculi orbiculati. Ocelli nulli? Alæ anticæ longissimæ, angustæ, apice truncatæ, venis 12 longitudinalibus inter angulum apicalem et regionem analem.

This subgenus is proposed for the two African species, *D. sinuosa* and *D. nervosa*, described by Boheman, and considered by him as constituting the first section of the genus. Notwithstanding the difference of its geographical range, the author adds the following species from Java, which agrees with the other two in all the subgeneric characters:

T. javanica, fulva; abdomine obscuriore vittâ centrali pallidiori, alis pallidè hyalinis anticis fasciâ latâ costali fuscâ. Java. D. Horsfield. In Mus. Soc. Mercat. Ind.

PHENICE. Rostrum pectore vix longius. Antennæ capite manifestè breviores. Oculi oblongi, vel obovati, distinctè emarginati. Ocelli distincti. Alæ anticæ quam in *Thraciâ* breviores, apice subrotundatæ, venis ferè ut in *Mysidiâ* dispositis, 12 longitudinalibus inter angulum apicalem et regionem analem.

This subgenus is proposed for the three African species, *D. fritillaris*, *fasciolata*, and *stellulata*, described by Boheman, and forming his second section of *Derbe*.

After reviewing the characters of the preceding subgenera, the author expresses the opinion that *Otiocerus* (including *Hymis*, Burm.) and *Anotia* of Kirby, must also be considered as subgenera of equal rank with the preceding; that *Anotia coccinea*, Guér. Icon.

R. An. MS. pl. 58, f. 3, forms another subgenus; and that the two following groups also constitute two other subgenera of *Derbe*:

PATARA. Rostrum ad basin pedum posticorum extensum. Oculi maximi, subtus emarginati. Ocelli obsoleti. Antennæ maximæ, compressæ, verrucosæ, apice subtruncato et setigero. Alæ anticæ longitudine mediocres, apice rotundatæ, venis paucis cellulisque tribus discoidalibus.

P. guttata, capite thoraceque fulvis, alis anticis griseo-fuscis margine albo-guttatis. Insula S^{ti} Vincentii. D. Guilding. Mus. D. Hope.

P. albida, luteo-albida; antennis nigricantibus, alis anticis albis farinosis apicem versus fuscescenti-tinctis, guttis albis sanguineisque ornatis. Insula S^{ti} Vincentii. D. Guilding. Mus. D. Hope.

CENCHREA. Frons parùm producta. Oculi magni, emarginati. Ocelli 2. Antennæ minutæ, articulo 2do brevi subrotundato. Prothorax latus, lateribus pro receptione antennarum concavo-dilatatis. Alæ anticæ elongatæ, angulo antico apicali valdè obtuso, venis perpaucis longitudinalibus.

C. dorsalis, pallidè testaceo-fulva; alis anticis flavescentibus margine interno fuscis apice punctis duobus purpureis. Insula S^{ti} Vincentii. D. Guilding. Mus. D. Hope.

The species above described, together with their structural characters, and especially the variations in the direction of the veins of the wings, were illustrated by numerous magnified figures.

December 15.

Mr. Forster, V.P., in the Chair.

The Rev. William Cuthbert, D.D., and William Griffith, Esq., of the Hon. East India Company's Medical Service, were elected Fellows.

Read, an "Account of two new Genera of Plants, allied to *Ola-cinea*." By George Bentham, Esq., F.L.S.

The two new genera on which this paper is founded are *Pogopetalum*, Benth., collected by Mr. Schomburgk in British Guiana; and *Apodytes*, named but not described by Prof. Ernst Meyer, among the South African plants collected by Drège. A third genus, *Leretia* of Vellozo, figured in the 'Flora Fluminensis,' is also characterized for the first time.

After noticing the opinions of various authors as to the affinities

of *Olacineæ*, and enumerating the genera hitherto referred to that family, Mr. Bentham enters into a detailed examination of its characters and of their modifications in the different genera, the most important of which he condenses into the following character of the Order.

Ord. OLACINEÆ.

Calyx parvus, liber v. basi adnatus, truncatus v. denticulatus, fructifer persistens immutatus v. auctus. *Corollæ* petala 4, 5, v. 6 hypogyna v. subperigyna, subcoriacea, æstivatione valvata, libera v. per paria connexa v. basi in tubum coalita. *Stamina* definita, cum petalis inserta, iis coalita v. libera, numero petalorum dupla v. æqualia fertilia rariùs asymmetrica, alterna sæpe sterilia difformia. *Antheræ* introrsæ, biloculares, oculis rimâ longitudinali dehiscentibus. *Ovarium* toro nunc parvo, nunc incrassato et interdum cum calyce concreto insidens, 1-loculare (nunc spurie et incompletè 3—4-loculare) v. rariùs excentricè 3-loculare. *Ovula* in loculo 2, 3 v. 4 collateralia, rariùs solitaria, ab apice placentæ liberæ v. ovario v. dissepimentis spuriis connatæ pendula, anatropa. *Stylus* erectus, simplex, stigmatè nunc truncato tenui, nunc incrassato 2—3—4-lobo. *Drupa* calyce immutato stipata v. ampliata cincta, velata v. adnata, pericarpio tenui carnoso v. exsucco, putamine crustaceo v. osseo, abortu 1-spermo, rariùs 2—3-spermo. *Semen* inversum, v. sæpiùs placentâ cum illo a basi concretâ spurie erectum, umbilico lato basilari affixum. *Embryo* in axi albuminis copiosi carnosii, rectus, apici fructûs proximus, nunc brevissimus, rariùs dimidio albuminis longior, radiculâ apicem fructûs spectante brevissimâ, cotyledonibus semiteretibus, plumulâ inconspicuâ. *Arbores* v. frutices erecti v. interdum scandentes, inerms v. ramis axillaribus spinescentibus armati, glabri v. parcè pubescentes. *Folia* alterna, simplicia, integerrima, exstipulata, glandulosa. *Flores* hermaphroditæ, v. abortu polygamæ, nunc axillares distinctè v. irregulariter racemosi, spicati v. cymosi, nunc terminales cymoso-paniculati, rariùs solitarii laterales v. axillares. *Bracteæ* squamæformes, sæpiùs minutæ, rariùs juniores imbricatæ. *Bracteolæ* parvæ in cupulam connatæ v. nullæ.

Mr. Bentham distinguishes three tribes characterized as follows :

Trib. I. OLACEÆ. *Ovarium* basi dissepimentis spuriis (rariùs evanidis) 3—4-loculare, apice 1-loculare, placentâ centrali dissepimentis spuriis basi adhærente supernè liberâ. *Ovula* tot quot loculi spurii ex apice placentæ pendula. *Semen* erectum. *Inflorescentia* axillaris, racemosa, racemis rariùs ad florem unicum reductis.

Trib. II. OPILIEÆ. *Ovarium* a basi 1-loculare. *Ovulum* (saltem per anthesin) unicum, minimum, ab apice placentæ liberæ centralis pendulum. *Stylus* centricus. *Semen* erectum. *Inflorescentia* axillaris, racemosa.

Trib. III. ICACINEÆ. *Ovarium* a basi 1-loculare, v. excentricè et completè

3-loculare. *Ovula* in quoque loculo duo, ab apice placentæ hinc ovario adnatæ collateraliter affixa, pendula, in loculo superposita, placentâ alterâ elongatâ. *Stylus* excentricus. *Semen* pendulum. *Inflorescentia* cymosa, axillaris v. terminalis.

To the first tribe Mr. Bentham refers *Heisteria*, L., *Ximenia*, L., *Olox*, L. (including *Spermaryrum*, Labill., and *Fissilia*, Comm.), and *Schæpfia*, L.; to the second, *Opilia*, Roxb. (including *Groutia*, Guill.), and *Causjera*, Lam.; and to the third, *Gomphandra*, Wall., *Icacina*, A. Juss., *Apodytes*, *Leretia* and *Pogopetalum*.

He considers *Schæpfia* to be far removed from *Loranthaceæ* by the structure of its ovary, while it differs from *Symplocos* in the æstivation of its corolla and the incomplete division of its ovary,—two points in which it agrees remarkably with *Olox* and *Ximenia*. He describes the greater part of its ovary as well as the margin of its calyx as free, and states that an adherence almost as complete exists in some species of *Olox*. The gamopetalous corolla he regards as a character of little consequence in orders where the æstivation is valvate, and as existing to a considerable degree in *Olox* itself. In *Schæpfia* the stamens are more closely adherent to the corolla, but the filaments are filiform and prominent from the base of the latter, and are not confounded with its substance.

He states *Causjera* to differ from *Thymelea*, to which it is usually referred, in the nature of the floral envelopes, in the position of the stamens, and in the structure of the ovary and of the fruit; and adds, that in all these points it agrees with *Opilia*, from which it differs only in the adherence of its petals.

The genera *Apodytes*, *Leretia* and *Pogopetalum* are characterized as follows:

APODYTES.

Flores hermaphroditi. *Calyx* parvus, immutatus. *Petala* 4, 5. *Stamina* totidem, iis alterna, sterilia nulla. *Ovarium* 1-loculare. *Fructus* ovato-reniformis, subcompressus, hinc appendice carnosâ auctus. *Inflorescentia* terminalis.

LERETIA.

Flores hermaphroditi, v. abortu masculi. *Calyx* parvus, immutatus. *Petala* 5, intus villosa. *Stamina* totidem, iis alterna, sterilia nulla. *Ovarium* 1-loculare. *Fructus* (ex icone Fl. Flum.) depresso-globosus. *Inflorescentia* axillaris, laxa.

POGOPETALUM.

Flores hermaphroditi. *Calyx* parvus (fructifer parùm auctus?). *Petala* 4, 5, intus villosa. *Stamina* totidem, iis alterna, sterilia nulla. *Ovarium* 3-loculare. *Fructus* depresso-globosus? *Inflorescentia* axillaris, densa.

Of the latter genus two species are characterized :

P. orbiculatum, foliis ovato-orbiculatis obtusissimis subtus ramulisque incanis, ovario hispido.—A shrub ten or twelve feet in height, found in dry Savannahs on the Padawire River, *Schomburgk*.

P. acuminatum, foliis ovatis oblongisve acuminatis subtus vix pallidioribus, ovario glabro.—A tree of about thirty feet high, growing on the high banks of the Rio Negro, *Schomburgk*, n. 970.

Mr. Bentham suggests that the three tribes above characterized may perhaps, when better known, be considered as distinct orders. He thinks, however, that the species of *Ola*x in which the dissepiments of the ovary are almost entirely obliterated form a transition to *Opilieæ*; that *Gomphandra* connects *Opilieæ* with *Icacineæ*; and that *Pogopetalum* is in many respects equally allied to *Olacææ* and to *Icacineæ*. He states that *Olacææ* approach most nearly to the polypetalous orders with which *Olacineæ* have been compared; but he cannot admit of the supposed affinity between them and *Aurantiaceæ*. *Humiriaceæ* are, he thinks, among Dichlamydeous plants, those which come nearest to *Olacineæ*; and he considers *Styracææ* (including *Symploceæ* and *Halesiaceæ* of Don) to be very near both to *Humiriaceæ* and *Olacineæ*. *Corneæ* and some other albuminous orders have also, in his opinion, some relation to them, but much more distant.

He considers the nearest approach to *Santalaceæ* to occur in the tribe *Opilieæ*, where the calyx is reduced to little more than a dilatation of the torus; and if it be admitted that there are true Santalaceous genera with a superior ovary, and if he is right in supposing that, in the young buds of *Opilia* and *Cansjera*, there is more than one ovule, these two genera become so nearly intermediate, in his opinion, between *Olacææ* and *Santalaceæ*, as to have nearly as much claim to be associated with the latter as with the former.

Lastly, he states that *Icacineæ* recede from the two other tribes in the adherence of the placenta to one angle of the ovarium, and in the seed being consequently pendulous and not erect; a circumstance which would have led him to propose it as a distinct order, were it not for the remarkable resemblance in the floral parts to some true Olacineous genera, and the absence of any other distinctive character of importance.

In the notes to the paper Mr. Bentham characterizes several undescribed species of *Ola*x in the following terms :

O. nana (Wall. Cat. Herb. Ind. n. 6783.) suffruticosa? glabriuscula, ramis erectis parè ramosis, foliis subsessilibus oblongis lanceolatisve ob-

tusis vix mucronulatis, pedicellis axillaribus solitariis 1-floris, calyce libero, staminibus sterilibus bifidis.—*Napalia?* *Wallich.*

O. acuminata (Wall. l. c. n. 6781.), fruticosa scandens? glabra, ramis angulatis, foliis ovato-lanceolatis acuminatis, racemis brevibus distichis paucifloris, calyce toro incrassato basi breviter adnato, staminibus sterilibus bifidis.—Sillet, *Wallich.*

O. macrophylla, glaberrima, foliis ovato-lanceolatis acuminatis inæquilateralis, racemis axillaribus brevibus distichis, calycibus glabris ovarii basi adnatis: margine libero truncato, staminibus sterilibus integris v. vix emarginatis, ovario glabro.—In Monte Padawan Guianæ Anglicæ, *Schoumburgk.*

O. pauciflora, foliis ovatis junioribus ramulis pedicellisque puberulis, pedunculis axillaribus 1—3-floris, calycibus molliter pubescentibus ovarii basi adnatis: margine libero brevissimo truncato, staminibus sterilibus longè bifidis, ovario villosa.—Serra Acurua Provincie Bahiensis Brasilæ; *Blanchet*, n. 2795.—An huc *Dulacia singularis*, Vell. Fl. Flum.?

January 19, 1841.

Mr. Forster, V.P., in the Chair.

John MacClelland, Esq., of the Hon. East India Company's Medical Service, was elected a Fellow; and Mr. F. Westcott, of Birmingham, an Associate of the Society.

Mr. Mann, F.L.S., exhibited a specimen of *Sedum Telephium*, which had been preserved for two years in his Herbarium, and still continued to send forth buds.

Mr. Babington, F.L.S., exhibited some Fir-cones taken from beneath about ten feet of solid peat at Burrishoole, near Newport, co. Mayo, where they were accompanied by nuts of *Corylus Avellana*. He stated that the trees in that part of Ireland had all been destroyed for about 200 years, and that no individuals of either species now occur within very many miles, except a few planted of late years and far from this locality. Professor Don remarked, that the Cones differed from either of the varieties of *Pinus sylvestris* at present found in Scotland; and that they so entirely resembled those of the alpine form of that species, figured by Jacquin under the name of *Pinus Mughus*, as to leave but little doubt of their identity. He added, that he regarded *Pinus Pumilio* as only another form of the same species.

NO. XI.—PROCEEDINGS OF THE LINNEAN SOCIETY.

Read, "A Description of a new genus of *Lineæ*." By Charles Cardale Babington, Esq., M.A., F.L.S.

This genus, which Mr. Babington regards as assisting to establish more fully the relationship of *Lineæ* to *Malvaceæ*, is stated to differ from the usual structure of *Lineæ* by its imbricated and not contorted petals, which are also not unguiculate, although slightly attenuated below, and by the remarkably thick coats of its one-seeded, perfectly closed carpels. Its essential character is given as follows :

CLIOCOCCA.

Sepala 5, integra. *Petala* 5, in æstivatione imbricata. *Stamina* 5. *Cap-sula* 10-locularis; *loculis* clausis indehiscentibus.

The plant on which the genus is founded was raised in the Cambridge Botanic Garden from seeds gathered in the interior of New South Wales by Mr. Melliush, and has flowered there during three successive years.

Read also, "Extracts of Letters from Wm. Griffith, Esq., F.L.S., to R. H. Solly, Esq., F.L.S."

In the first of these letters, dated from Olipore, April 8th, 1840, Mr. Griffith states that he had recently examined two species of *Ephedra*, and had no doubt that the ovulum is, as described by Mr. Brown, naked. The first of these species has a very siliceous stem, without stomata, unless certain discs blocked up with some hard matter (silex ?) are to be so considered; which he believes to be the correct view, inasmuch as the other species, which has no siliceous deposit, has stomata of the ordinary structure arranged in a similar manner.

He had also examined the ovaria of some Orchideous plants, in which he found, in conformity with Mr. Brown's observations, that the cords sent down to the placentæ and subdividing into branches, one of which passes on each side of each placenta, do not exist before impregnation. He adds, that the size of the cords is certainly in proportion to the degree of solution of the pollinia by the stigmatic action.

In another letter, dated April 23rd, Mr. Griffith describes the ovule of the outer cell of *Callipeltis*? (that of the inner being always abortive) as deriving its membranous covering from the inner layer of the ovarium. The ovulum itself he states to be reduced to its nucleus, but otherwise exactly to resemble those ovula which have their foramen near the hilum. The same structure, he adds, exists in the two species of *Galium* found in the neighbourhood; the seed

having no proper covering except the albumen and embryonary sac, its proper coat adhering intimately with the free inner layer of the ovary, and this again adhering slightly with the calycine layer of that organ.

In another letter, dated from Cabul, July 23rd, 1840, Mr. Griffith alludes to the mode of attachment of *Cuscuta* and *Orobanche*. *Cuscuta*, he says, differs in this respect but little from *Loranthus*: the suckers stop at the first completely-formed wood, and never penetrate further, and both the cortical and ligneous systems pass into the stock. In *Orobanche*, which, however, he has only slightly examined, the attachment seems to him to be made only by a bundle of ducts derived from the outer part of the central system, which spread out into a disc over the surface of the first completely-formed wood they meet. He states the *Cuscuta* examined to be a gigantic species in extent, infesting willows, poplars, a species of *Elæagnus* and the *Alhagi Maurorum*. It also preys, he says, extensively on itself; and one of its intricate masses, half covering a willow-tree twenty or thirty feet high, presents a remarkable spectacle.

February 2.

Mr. Forster, V.P., in the Chair.

Addresses of Congratulation to Her Majesty and to His Royal Highness Prince Albert, on Her Majesty's safe delivery of a Princess, were read and agreed to.

Read a paper "On a peculiar kind of Organs existing in the Pitcher of *Nepenthes distillatoria*." By Prof. Don, Libr. L.S.

These organs, named by Prof. Don 'clathrophores,' occupy the lower half of the inside of the pitcher, and have been described by Treviranus, Meyen and Korthals. Doubts still exist as to their precise function; but it appears to him probable either that they are the mouths by which the fluid is poured out into the pitcher, or that they are connected with the function of respiration.

He thinks with M. Morren that the pitcher originates from the lamina of the leaf, the margins of which become united at an early period; while he regards the operculum as formed upon the plan of the cucullate sepal and petals of *Aconitum*, and derived from the apex

of the leaf. He regards the pitchers of *Sarracenia* as formed upon the same principle; but compares those of *Cephalotus* to the labellum of *Cypripedium*, the modified leaf being produced anteriorly into a pouch, and the operculum being posterior, and not anterior, as in *Nepenthes*.

The cuticle of the upper surface of the expanded part of the petiole of *Nepenthes distillatoria* is described as destitute of stomata; that of the under surface as being furnished with numerous oval, or nearly orbicular stomata, composed of two semicircular cellules with rectilinear faces. That of the outer surface of the pitcher is also without stomata, but covered, especially in the young state, with long subulate hairs, frequently dichotomous, or furnished with a spur-like process at their base. The outer surface of the operculum is sparingly furnished with stomata, and clothed with hairs which are frequently branched and fasciculate; the inner has no stomata, but is furnished with clathrophores and clothed with hairs, which are often fasciculate, but mostly simple.

In *Sarracenia purpurea* the cuticle of the pitchers is described as consisting of sinuously-lobed and somewhat stelliform cellules, with numerous small, oval, closed stomata. The fibrous bundles are stated to be composed entirely of long pleurenchyma, the parenchyma adjacent to which consists of beautiful spiral cellules. The hairs of the inner surface of the operculum are simple, hollow, reflexed, subulate, and marked with numerous longitudinal parallel lines or striæ; they proceed from a somewhat elevated base. In the pitchers of *Cephalotus* the stomata are large, oval and closed; the spiral vessels smaller than in *Nepenthes*, and containing only a single fibre; and the hairs which form the fringed border are simple, obtuse and transparent.

Read also "A Descriptive Catalogue of the *Gramineæ* and *Cyperaceæ* contained in the Indian Herbarium of Dr. Royle." By C. G. Nees von Esenbeck, F.M.L.S., President of the Imperial Leopoldino-Caroline Academy Naturæ Curiosorum.

The following are the characters of the new genera described in this paper.

Trib. SACCHARINEÆ.

LEPTATHERUM, *Nees*.

Spiculæ in rachi ad articulos barbâ cinctâ geminæ, homogamæ, hemiologamæ, alterâ sessili, alterâ pedicellatâ, utrâque setigerâ. *Glumæ* duæ, herbaceo-membranaceæ, acutæ; inferior dorso canaliculata, quadrinervis; superior carinata trinervis. *Flosculi* univalves membranacei;

inferior neuter, muticus; superior linearis, canaliculatus, apice transiens in setam longam capillarem apice subcirrhosam non genuflexam. *Lodiculæ* 2, obconicæ, plicatæ, truncatæ, ovario breviores, membranaceæ. *Stamina* 3, filamentis capillaribus. *Styli* basi conjuncti, graciles; stigmata villosa. *Caryopsis* libera, lanceolata, acuta. *Inflorescentia*: *Spicæ*, rachi continuâ, triangulari, glabrâ, solis spicularum insertionibus barbularis, fasciculatæ, laxæ.—*Herba*, habitu Panicis Sectionis Digitaliarum. *Culmus* racemosus, adscendens. *Vaginæ* longæ. *Folia* lanceolata, acuta, plana, lætè viridia, nervo albo. *Ligula* nulla. *L. Royleanum*, Nees.

BATRATHERUM, Nees.

Spiculæ in rachi articulata geminata, heterogamæ, alterâ sessili hemigamâ, alterâ pedicellatâ neutrâ. *Glumæ spiculæ* perfectæ 2, subæquales, herbaceo-chartaceæ, acutæ, apiceve acutè bidentatæ, in aliis superior apice setacea; inferior plana, 2—6-nervis; superior carinata, complicata, 1—3-nervis, a dorso plicata, canalem struens, in quo seta flosculi continetur, margine tenui simpliciter connivente. *Flosculi* membranacei, glumis breviores, nunquam saltem longiores; inferior neuter, 1-valvis, muticus; superior bivalvis; valvulâ inferiori acuminatâ apice minutè bidentatâ propè a basi emittente setam in medio geniculatam infernè tortam; superiori exiguâ lineari-subulatâ bidentatâ quandoque nullâ. *Lodiculæ* latæ, membranaceæ, truncatæ, dentatæ, plicatæ, in semicirculo singulæ singulum floris latus ambientes. *Stamina* 3. *Stigmata* villosa. *Styli* discreti. *Spicula* pedicellata angustior, subuniglumis. *Gluma* plana acuta nervosa, margine subtiliùs serrulata; superior gluma et flosculi rudimentum minuta, rotundata, squamiformia. *Inflorescentia*: *Spica* parcè dichotoma, ad genicula magis minùsve barbata. *Pedicelli spicularum sterilium* ciliati.—*Gramina* repentia, ramosa, foliis brevibus amplexicaulibus. *Stipulæ* membranaceæ, exsertæ.

B. micans, Nees.

APOCOPIS, Nees.

Spiculæ in rachi angustâ barbularis subgeminæ muticæ, alterâ rudimentali pedicellari, alterâ polygamâ sessili. *Glumæ* truncatæ; inferior lata, plana, obovato-conica, coriaceo-chartacea, 8—9-nervis, lævis, apice minutè bidentata et inter denticulos subciliolata, basin versus firmior et colorata; superior ovata, apice angustior denticulataque, chartacea, marginibus inflexa, lævis, quinquenervis. *Flosculi* 2, membranacei, bivalves, mutici; inferior masculus valvulis æqualibus, apice truncatis denticulatis, dentibus aliquot magis distantibus. *Stamina* 3, antheris angustis, fulvis. *Lodiculæ* exilissimæ, quandoque omninò nullæ quandoque denticuliformes acutæ. *Flosculus* superior hermaphroditus, vel potiùs hermaphrodito-femineus. *Valvula* inferior paulò firmior reliquis et colorata, apice truncato-bi-tri-denticulato; superior brevior, latiùs truncata, ciliolato-denticulata. *Lodiculæ* nullæ, aut forsan, ut in masculino, exilissimæ. *Stamina* 3, eo tempore quo flosculi masculi stamina

antheris perfectissimis filamentisque nondum elongatis intra valvulas adhuc latent, jam maximè extenuatis filamentis antheris autem nullis residuis extra valvulas prominentibus, conspicua. *Ovarium* lanceolatum, in stylum simplicem, mox bifidum, transiens. *Stigmata* longa, linearia, brevi-villosa. *Spiculæ neutrius vestigia* produntur pedicello, spiculæ fertili adjecto, ciliato, mutilo. *Inflorescentia*: *Spica* bifida aut geminata; articulis trigonis ciliato-hirsutis ad genicula longiùs barbularis.—*Gramen* tenerum, gracile, ramosum. *Nodi* glabri. *Vaginæ* arctæ. *Folia* plana, lineari-acuta.

A. Royleanus, Nees.

Trib. STIPEÆ.

ORTHORAPHIUM, Nees.

Spiculæ unifloræ. *Glumæ* duæ convexæ, chartaceo-membranaceæ, plurinerves. *Flosculus* collo barbato hinc depresso-plano insertus, bivalvis, chartaceus. *Valvula* inferior plurinervis, convoluta, apice attenuata in subulam continuam non articulata neque contortam; superior brevior, binervis, dorso convexa. *Lodiculæ* 3, membranaceæ; duæ anteriores lanceolatae, ovarium æquantes, basi callo insertæ; posterior lanceolato-linearis, ovario duplò longior. *Stamina* 3, antheræ flavæ, apice barbatae aut nudæ. *Ovarium* sessile, apice calloso-incrassatum. *Styli* breves, basi contigui. *Stigmata* plumosa. *Caryopsis* libera. *Inflorescentia*: *Panicula* angusta, ramis paucifloris.—*Gramina* foliis angustis rigidis, caudâ aristæformi spicularum mediocri rigidulâ scabrâ.

O. Roylei, Nees.

Trib. CHLORIDEÆ.

MELANOCENCHRIS, Nees.

Spiculæ sesquifloræ aut subtrifloræ, flosculo extremo rudimentali, in rachi propriâ brevi alternæ quidem, sed adèò approximatae ut capitulum involucretum exhibeant; superiores rachillæ imperfectæ. *Glumæ* in infimis duæ, æquales, in superioribus quandoque in omnibus una (supera), bractæformes, subulatae, rigidæ, hirsutæ, flosculis longiores, basi membranaceo-marginatæ. *Flosculi* perfecti duo, ubi gluma singula residet quasi axillares in angulo glumæ et rachillæ; quorum alter rachillæ propior, hermaphroditus, perfectus, sessilis; alter masculus vel neuter pedicellatus; tertius, ubi adest, rudimentalis, clavatus, nudo pedicello seu rachillæ apice indicatus. *Valvulæ* duæ, membranaceo-herbaceæ; inferior trinervis, apice bifida, laciniis æqualibus lineari-subulatis, vel bifida cum setâ interjectâ; superior æquæ longa, plana, binervis, apice bifida. *Flosculus* superior conformis, sed minor. *Lodiculæ* breves, subquadratae, bidentatae, glabræ. *Stamina* 3. *Antheræ* lutæ. *Ovarium* oblongum, compressum, læve, truncatulum. *Styli* longi, latè discreti, filiformes. *Stigmata* angusta, dissitè brevi-puberula. *Caryopsis* libera. *Inflorescentia*: *Spicæ* partiales, formâ involucrorum Cenchræ aut Penniseti, in rachi communi flexuosâ alternæ, secundæ, paucæ, nutantes racemulum exhibent.—*Gramina* perennia, parva, polyphylla,

ramosa. *Folia* brevina, rigidula. *Ligula* nulla. *Racemus* exsertus, gracilis, secundus, laxus. *Setæ* flosculorum coloratæ.

1. *M. Royleana*, Nees.
2. *M. Rothiana*, Nees.

Pomereulla monoica, *Roth.*

Trib. FESTUCEÆ.

PLAGIOLYTRUM, Nees.

Spicula multiflora. *Glumæ* duæ, spiculâ breviores; inferior minor amplectens, obliquè acutata, altero latere subpræmorsa; superior bidentata, et inter dentes brevi-subulata, subulâ dentes æquante, e nervi dorsalis geminati apice unito ortâ. *Flosculi* in axi gracili ad genicula barbulata imbricati, bivalves. *Valvula* inferior ovata, lateribus incurva, herbacea, trinervis, apice bilaciniata laciniis muticis, setis tribus strictis, e nervo medio duobusque lateralibus proficiscentibus interjectis; superior oblonga, magis membranacea, sursùm plana, in apice obtusiusculo bifida, inferiùs convoluta, referens flosculum ligulatum Synanthereæ, subquadrinervis, nervis duobus marginibus proximis distinctis, mediis obsoletis. *Lodiculæ* 2, coloratæ, conicæ, truncatæ, glabræ, angustæ. *Stamina* 2 (?). *Filamenta* capillaria. *Ovarium* cylindricum, glabrum. *Styli* filiformes, distantes. *Stigmata* laxè villosa. *Caryopsis* elongato-cylindrica, compressiuscula, truncato-bidenticulata. *Inflorescentia*: *Spica* simplex, disticho-subsecunda.—*Gramina* erecta, foliis angustis, ligulâ brevi.

1. *P. calycinum*, Nees.
Dineba calycina, *Hb. Wight.*
2. *P. filiforme*, Nees.
3. *P. unidentatum*, Nees.

Many new species belonging to genera previously established are also characterized and described.

February 16.

The Bishop of Norwich, President, in the Chair.

The Most Hon. Spencer Joshua Alwyne, Marquis of Northampton, President of the Royal Society, was elected a Fellow; and Mr. George Gordon an Associate.

Read "Observations on some new or little-known species of *Polyparia*, found in the supercretaceous strata of Italy." By Signor Giovanni Michelotti of Turin.

March 2.

Mr. Forster, V.P., in the Chair.

Read a "Description of a new genus of Plants from Brazil." By John Miers, Esq., F.L.S.

The following are the characters of the new genus described :—

TRIURIS.

Flores dioici. *Perianthii foliola* 3, obovata, infra apicem processu longo instructa. ♂ *Antheræ* 3? sessiles, loculis disjunctis, imo androphoro magno carnoso centrali insertæ. ♀ *Pistilla* numerosissima, aggregata, supera. *Styli* simplices, subulati. *Fructus* ignotus.—Planta *pusilla hyalina*, foliis *paucis bracteiformibus*.

T. hyalina.

Hab. in humidis Serra dos Orgãos Provinciæ Rio de Janeiro.

Mr. Miers observed this minute plant only in a single locality, and was unable to find ripe fruit. He perceived, however, in each pistillum what appeared to him to be a solitary ovule, but so minute and indistinct as to be evident only by the appearance of a darker oval form in the centre. He has consequently no positive evidence whether it is Monocotyledonous or Dicotyledonous; but is induced by various considerations to refer it to the former class. He notices the points in which it appears to him to bear some resemblance to different Monocotyledonous families, and suggests that, as it cannot be distinctly referred to any of them, it may probably be taken as the type of a distinct order, holding a place between *Burmanniaceæ* and *Fluviales*.

The processes which are noticed in the character as arising from below the apices of the divisions of the perianthium, are described as capillary tubes three times as long as the segments, within which they are coiled up during æstivation, their apices exhibiting at the apex of the bud three minute pore-like apertures open externally.

Read also a "Note on the Preservation of Specimens of Natural History." By Hyde Clarke, Esq., F.L.S.

Mr. Clarke suggests the application of Payne's apparatus for the preservation of animal substances for domestic purposes, to the preservation of objects of Natural History. The apparatus consists of an iron cylinder, in which the subject for preparation is placed, and the air-tight cover screwed down. The air is then exhausted by means of an air-pump, and when a sufficient exhaustion has been effected, a cock is opened communicating with a vessel containing

the antiseptic fluid, which, on being admitted, thoroughly penetrates the object to be preserved, impregnating even the marrow of the bones. He adds, that the process is useful not only for the prevention of putrefaction, but also in arresting its progress, the gases generated during putrefaction being expelled from the receiver along with the air, and their place supplied by the antiseptic.

March 16.

Mr. Brown, V.P., in the Chair.

Mr. William Kay was elected a Fellow of the Society.

Read "On an edible *Fungus* from Tierra del Fuego, and an allied Chilean species." By the Rev. M. J. Berkeley, M.A., F.L.S.

Mr. Berkeley describes these two species as constituting a new genus, which he characterizes as follows :—

CYTTARIA.

Receptacula carnosogelatinosa in stroma commune subglobosum, epidermide crassiusculâ vestitum, aggregata; basi stipitiformi granulata. *Cupula* peripherica, primò clausa, gelatinâ distenta, demùm epidermide ruptâ aperta. *Hymenium*, margine excepto, separabile. *Asci* amplii, demùm liberi, paraphysibus immixtis. *Velum* persistens, demùm ruptum, margine plus minus reflexo. *Sporidia* pallida.

Genus *Bulgaricæ* affine, sed stromate pulvinato ex variis individuis composito *Sphæriam concentricam* quodammodo referens, et hymenio separabili valdè diversum. Certè ad seriem *Pezizarum* pertinet, perithecio spurio non obstante. Confer *Sphæriam monocarpam*, Schum. ad *Pezizam rhizopodam* a clar. Friesio ascriptam. Nomen dedi a *κυτταρος*, ob superficiem fungi alveolatam.

1. *C. Darwinii*, vitellina globoso-depressa, cupulis parvis ore irregulari demùm apertis.

Hab. in *Fagum betuloidem* in Tierra del Fuego, Dec.-Jun.

2. *C. Berteroi*, pallidior irregularis, basi subelongatâ, cupulis majoribus; ore pentagono; margine fesso reflexo.

Hab. in Chili in *Fagum obliquam*, vere et æstate.

The first species is noticed by Mr. Darwin (from whom Mr. Berkeley obtained his specimens of both) at p. 298 of his 'Journal and Remarks,' forming the third vol. of the 'Narrative of the Voyages of the Adventure and Beagle'; and Mr. Berkeley gives from Mr. Darwin's MS. notes a more detailed account of his observations made upon the spot. The second species is referred to in a post-

NO. XII.—PROCEEDINGS OF THE LINNEAN SOCIETY.

humous list of the plants collected by Bertero (originally published in the 'Mercurio Chileno,' and translated in Silliman's 'North American Journal,' vol. xxiii. p. 78), as forming, perhaps, "a new genus approximating to the *Sphæria*." A further account of this species also is extracted from Mr. Darwin's notes: it seems to be less eatable, and less frequently eaten than the first, which Mr. Darwin describes as forming a very essential article of food for the Fuegian.

Read also a "Letter from Joseph Woods, Esq., F.L.S., to Mr. Kippist, on *Crepis biennis* and *Barkhausia taraxacifolia*."

Mr. Woods is of opinion that the plant described by Sir James Smith in the 'English Flora' and 'English Botany,' by Sir W. J. Hooker in the 'British Flora,' by Mr. Babington in the Society's 'Transactions,' vol. xvii. p. 456, and by Mr. Mackay in his 'Irish Flora,' as *Crepis biennis*, is in reality *Barkhausia taraxacifolia*, distinguished especially by the long beak of its achenia, while those of *Crepis biennis* are, in the words of Gaudin, "neutiquam attenuata." The stem of *Crepis biennis* is also less branched and more leafy than that of *Barkhausia taraxacifolia*, the latter rarely producing a leaf except where there is a branch. Mr. Woods adds, that it is almost certain that we have the two species in England, though the difference has not been noticed. *Crepis biennis* grows in Kent and Surrey.

In a "Note" appended to Mr. Woods's letter, Mr. Kippist states that the authentic Linnean specimens of *Crepis biennis* from Scania, although too young to have ripe seeds, appear to confirm Mr. Woods's idea, the pappus being quite sessile even in those most advanced, and the stem moderately branched in the upper part, and very leafy below. The two specimens in the Smithian Herbarium, one from Mr. Crowe's garden and the other from Mr. Rose's Herbarium, have the stem much branched, and the pappus apparently sessile, but the achenia are immature.

The only developed specimen in Mr. Winch's herbarium is from Dartford in Kent, and has the pappus very decidedly stalked, the stem much branched in the upper part, and only a few scattered leaves in the lower, a branch being produced from the axilla of each cauline leaf with the exception of one or two of the lowermost. Other specimens, gathered near Cobham and Ramsgate, in the same county, and near Moulsey in Surrey, agree with Mr. Winch's plant in their stalked pappus and branched stem, and probably therefore

belong to *Barkhausia taraxacifolia*. The only British specimens in the Society's possession that Mr. Kippist believes to be referrible with certainty to *Crepis biennis* are two in the Hortus Siccus of Mr. Woodward, with ripe achenia and perfectly sessile pappus; the habitats of the plants are not given, but in all probability they were gathered either in Suffolk or Norfolk.

Read also an "Extract from a Letter to John Miers, Esq., F.L.S., from George Gardner, Esq.," dated Rio de Janeiro, Dec. 16, 1840, in which Mr. Gardner gives some account of his journeys in the interior of Brazil, and of the collections made by him subsequent to May last.

April 6.

Mr. Forster, V.P., in the Chair.

Read, an Extract of a Letter from J. Burnham, Esq., to Hyde Clarke, Esq., F.L.S., on a supposed new British *Juncus*.

Read also the commencement of "An Appendix or Supplement to a Treatise on the *Œstri* and *Cuterebræ* of various Animals." By Bracy Clark, Esq., F.L.S., Corresp. Memb. of the French Institute.

April 20.

Mr. Brown, V.P., in the Chair.

John Branton, Esq., of Bush Hall, near Hatfield, Herts, was elected a Fellow.

His Grace the Duke of Northumberland, F.L.S., sent for exhibition a specimen of the fruit of *Chrysophyllum monopyrenum*, Sw., from his living collection at Syon House.

W. Felkin, Esq., F.L.S., sent for exhibition specimens of Sea-Island Cotton grown in a cotton-mill situate in the centre of Manchester, accompanied by a Notice of the circumstances under which the experiment was made. The details have been given in the Transactions of the British Association.

Read the conclusion of Mr. Bracy Clark's "Appendix or Supplement to a Treatise on the *Æstri* and *Cuterebræ* of various Animals."

The first memoir to which this paper is intended as an Appendix appeared in the third volume of the Linnean Transactions, published in 1796. This memoir was republished by the author with considerable additions in 1815, and a Supplement was added in the following year. Since that period much has been published on the subject, and Mr. Clark is desirous in consequence of making some additions and corrections to his former publications.

After adding to and modifying some of the passages contained in them, he examines the validity of several species of the genus *Æstrus* proposed by writers. He suspects *Æ. Trompe* of Modeer and *Æ. ericetorum* of Leach to be severally the males of *Æ. Tarandi* and *Æ. Bovis*. He believes *Æ. Pecorum* of Fabricius to be only a dark-coloured variety of *Æ. nasalis*, L. (*Æ. veterinus*, B. Cl.); and is satisfied by an examination of the original specimen, that Dr. Leach's *Æ. Clarkii* is nothing more than a very light-coloured variety of the same species. He also regards *Æ. lineatus* of Villars as synonymous with *Æ. Bovis*.

Referring to Latreille's account of the genus in Cuvier's 'Règne Animal,' he points out some omissions with regard to the habits and œconomy of *Æ. Equi* and *Æ. hemorrhoidalis*, and objects to the statement that the eggs of the latter are deposited on the verge of the anus of the animal attacked. He strongly deprecates the opinion of Pallas and Latreille, that there exists a proper human *Æstrus*, which he regards as altogether founded in error; and believes the larva figured in illustration of a supposed case of the kind published by Mr. Howship, to be that of *Æ. Bovis*.

Lastly, he describes three species, added to the genus *Æstrus* since the publication of his Treatise, viz. *Æ. pictus* of Megerle, *Æ. Libycus* of Rüppel, and *Æ. Clarkii* of Shuckard. The following are the characters of the latter species, figures of which, and of *Æ. Libycus*, accompany the paper.

Æ. Clarkii, cærulescenti-fuscus, alis obscuris anticè sinuatis basin versus atro-bipunctatis.

Hab. ad Caput Bonæ Spei.

He adds also a description of a new species of his genus *Cuterebra*, with the following characters:—

C. fontanella, thorace atro lateribus albis, abdomine violaceo: segmentis ultimis albis nigro-punctatis.

Hab. in Illinois Americæ Borealis, cuniculis præcipuè infesta.

May 4.

Mr. Brown, V.P., in the Chair.

Dr. Carl Ernst von Baer, His Serene Highness Maximilian Prince of Wied-Neuwied, and Dr. Charles Bernhard Trinius, were elected Foreign Members.

Read the commencement of "Remarks on some new or rare Species of Brazilian Plants." By Charles James Fox Bunbury, Esq., F.L.S.

May 24.

The Bishop of Norwich, President, in the Chair.

This day, the Anniversary of the birth-day of Linnæus, and that appointed by the Charter for the Election of Council and Officers, the President opened the business of the Meeting, and stated the number of Members whom the Society had lost during the past year. The following is a list of the Members who have died within that period, accompanied with notices of some among them.

Francis Bauer, Esq., F.R.S., &c., was born at Feldsberg, in Austria, on the 4th of October, 1758. His father, who held an appointment as painter to Prince Lichtenstein, died while he was yet a boy, and the care of his education devolved upon his mother. So early was his talent for botanical drawing manifested, that the first published production of his pencil, a figure of *Anemone pratensis, L.*, is appended to a dissertation by Störck 'de Usu Pulsatillæ nigricantis,' which bears date in 1771.

In 1788 he came to England in company with the younger Jacquin, and after visiting his brother Ferdinand, who was then engaged in completing the beautiful series of drawings since published in the 'Flora Græca,' was about to proceed to Paris. But the liberal proposals made to him by Sir Joseph Banks on the eve of his intended departure, diverted him from this resolution, and induced him to remain in England and to take up his residence in the neighbourhood of the Royal Garden at Kew, in which village he continued to dwell until the termination of his life. It was the opinion of Sir Joseph Banks, that a botanic garden was incomplete without a draughtsman permanently attached to it, and he accordingly, with the sanction of

His Majesty, fixed Mr. Bauer in that capacity at Kew, himself defraying the salary during his own life, and providing by his will for its continuance to the termination of that of Mr. Bauer. In fulfilment of this engagement with Sir Joseph, Mr. Bauer made numerous drawings and sketches of the plants of the garden, which are now preserved in the British Museum. A selection from his drawings was published in 1796 under the title of 'Delineations of Exotick Plants cultivated in the Royal Garden at Kew,' and this was intended to be continued annually; but no more than three parts, consisting wholly of Heaths, and containing thirty plates, were published.

In the early part of 1801, Mr. Bauer made for Mr. Brown, who had then been for some years engaged in a particular study of the Ferns, drawings of many genera of that family which Mr. Brown regarded as new. His drawings of *Woodsia*, made some years afterwards, were published in the 11th volume of our Transactions, in illustration of Mr. Brown's paper on that genus. At a later period he again directed his attention to that tribe of plants, his labours in which have within these few years been given to the world in Sir William Jackson Hooker's 'Genera of Ferns.' The 13th volume of our Transactions is enriched with his elaborate drawings accompanying Mr. Brown's memoir on *Rafflesia*; and the part published last year contains a paper by Mr. Bauer 'On the Ergot of Rye,' from materials collected between the years 1805 and 1809.

The plate which accompanies the last-mentioned paper is derived from drawings which form part of an extensive series in the British Museum, illustrative of the structure of the grain, the germination, growth and development of wheat, and the diseases of that and other *Cereal*ia. This admirable series of drawings constitutes perhaps the most splendid and important monument of Mr. Bauer's extraordinary talents as an artist and skill in microscopic investigation. The subject was suggested to him by Sir Joseph Banks, who was engaged in an inquiry into the disease of Corn known under the name of "Blight," and the part of Mr. Bauer's drawings which relates to that disease was published in illustration of Sir Joseph's memoir on the subject, and has been several times reprinted with it. Mr. Bauer has himself given, in the volume of the 'Philosophical Transactions' for 1823, an account of his observations on the *Vibrio Tritici* of Gleichen, with the figures relating to them; and another small portion of his illustrations of the Diseases of Corn has since been published by him in the 'Penny Magazine' for 1833. His figures of a somewhat analogous subject, the Apple-blight and the Insect produ-

cing it, accompany Sir Joseph Banks's Memoir on the Introduction of that Disease into England, in the 2nd volume of the 'Transactions of the Horticultural Society.'

Before the close of the last century Mr. Bauer commenced a series of drawings of *Orchideæ*, and of the details of their remarkable structure, to which he continued to add, as opportunities offered, nearly to the termination of his life. A selection from these, which form one of the most beautiful and extensive series of his botanical drawings, was lithographed and published by Professor Lindley between the years 1830 and 1838, under the title of 'Illustrations of Orchidaceous Plants.'

His other published botanical works are: 1. The first part, published in 1818, of '*Strelitzia Depicta*,' a work intended to comprise figures of all the known species of that magnificent genus; 2. 'Microscopical Observations on the Red Snow' brought from the Arctic Regions by Capt. Ross, the globules contained in which, by some regarded as an *Alga*, he described in the 7th volume of the 'Quarterly Journal' of the Royal Institution as a species of *Uredo*; 3. 'Some Experiments on the *Fungi* which constitute the colouring matter of the Red Snow,' published in the 'Philosophical Transactions' for 1820; and 4. The Plates to the Botanical Appendix to Captain Parry's first Voyage of Discovery, published in 1821. One of the last productions of his pencil, illustrating the structure of a plant growing at Kew which produces perfect seeds without any apparent action of pollen, will appear in the forthcoming part of our Transactions.

In the year 1816 he commenced lending the assistance of his pencil to the late Sir Everard Home in the various anatomical and physiological investigations in which that distinguished anatomist was engaged; and in the course of ten or twelve years furnished, in illustration of his numerous papers in the 'Philosophical Transactions,' upwards of 120 plates, which were afterwards reprinted with Sir Everard's '*Lectures on Comparative Anatomy*.' These plates, which form together the most extensive series of his published works, embraced a great variety of important subjects, chiefly in microscopic anatomy, and afford abundant evidence of his powers of observation and skill in depicting the most difficult objects.

It is this rare and previously almost unexampled union of the observer and the artist that has placed Mr. Bauer foremost in the first rank of scientific draughtsmen. His paintings, as the more finished of his productions may well be termed, are no less perfect as models of artistic skill and effect, than as representations of natural objects.

Of all his predecessors, Ehret alone approaches him in these particulars ; among his contemporaries, none but his brother Ferdinand can be regarded as his equal.

Mr. Bauer became a Fellow of the Linnean Society in 1804, and of the Royal Society in 1820. He died at his residence on Kew-Green on the 11th of December last, in the 83rd year of his age ; and was buried in the church-yard of that parish on the 16th of the same month.

Sir Anthony Carlisle, Kat., F.R.S., &c., a distinguished surgeon and physiologist, was born at Stillington, in the county of Durham, on the 8th of February, 1769, and received his early professional education partly at York and partly at Durham. He afterwards came to London, entered himself as a student at the Hunterian School under Cruickshank and Baillie, and became a resident pupil to Watson, whom he succeeded as one of the Surgeons of the Westminster Hospital in 1793. On the retirement of Sheldon, in 1808, he became Professor of Anatomy to the Royal Academy, and retained that office until 1824. He was also a member of the Council and of the Court of Examiners of the Royal College of Surgeons, of which College he was twice President. At the accession of George the Fourth he was knighted as a mark of acknowledgment to his professional skill. He died at his house, in Langham Place, on the 2nd of November last, and was buried in the Cemetery at Kensal Green.

Mr. Carlisle became a Fellow of the Linnean Society in 1792, and of the Royal Society in 1804 ; and his most important contributions to Natural Science are contained in the Transactions of these Societies. His paper on the Structure and Economy of *Tæniæ*, in the second volume of our Transactions, is probably the first attempt to illustrate the structure of *Entozoa* by artificial injections, and established, among other points, the non-existence of an anus in the *Tæniæ*. At this early period, Mr. Carlisle anticipated M. Virey's idea of the state of the nervous system in the lowest animals, on which the chief character of Mr. MacLeay's *Acrita* is founded, ascribing to the *Tæniæ* a diffused condition of the nervous substance, and referring to John Hunter as having, in his lectures, applied that character to many of the lower tribes of animals.

Of his papers in the 'Philosophical Transactions,' the first in importance and originality is the memoir 'On the peculiar arrangement of the Arteries in Slow-moving Animals ;' and it is on the striking discovery detailed in it that his memory as a comparative

anatomist will chiefly rest. His paper on the Physiology of the Stapes, published in the volume for 1805, affords a good example of the application of Comparative Anatomy to the elucidation of a difficult physiological question; almost all the facts contained in it relating to the form and structure of the stapes in various animals were new. The Comparative Anatomy and Physiology of the Organ of Hearing formed the subject of his Lectures at the College of Surgeons in 1818.

His Lectures on Extra-vascular Substances, also delivered at the College of Surgeons, but of which an abstract only of a small portion was published in the 'Annals of Philosophy,' are alluded to in high terms by Mr. Lawrence. In 1820, and again in 1826, he delivered the Hunterian Orations at the College. The latter of these, containing the Anatomy of the Oyster, has been quoted in reference to the observations which indicate the sensibility of the Oyster to light. He also spent much time in experiments on the growth and reparation of Shell. In the prosecution of his various inquiries he enriched the Museum of the College with some unique examples of his peculiar anatomical skill.

Besides these contributions to Comparative Anatomy and Animal Physiology, Mr. Carlisle communicated to the Horticultural Society a memoir 'On the connection between the Leaves and Fruit of Vegetables, with other Physiological Observations,' and another paper published in the 2nd volume of the Transactions of that Society.

The Bishop of Chichester.

Lord Henry John Spencer Churchill.

Sir John William Lubbock, Bart.

The Rev. Thomas Rackett, M.A., F.R.S., &c., during a long life successfully cultivated various branches of Natural Science and the liberal arts. Associated in his school-days with Hatchett, and afterwards with Maton, Pulteney and Cavallo, he became attached to the pursuits by which his friends were distinguished, and assisted warmly in the promotion of their views. In the years 1794 and 1796, he accompanied the two former in the tours which Dr. Maton subsequently published under the title of 'Observations relative chiefly to the Natural History, Picturesque Scenery, and Antiquities of the Western Counties of England,' and furnished with his pencil the embellishments of that work, which was inscribed to him in a friendly and grateful dedication. In conjunction with Dr. Maton, he published in the 7th volume of our Transactions 'An Historical

Account of Testaceological Writers,' and in the 8th 'A Descriptive Catalogue of the British Testacea.' These works may be justly characterized as manifesting extensive research, careful comparison, and accurate observation: the latter long continued to be the text-book of British Conchologists. Dr. Maton and himself also published in our 8th volume 'An Account of some remarkable Shells found in cavities of a Calcareous Stone, called by the stone-masons *Plymouth-Rag*;' and he subsequently contributed to the 11th volume 'Observations on *Cancer salinus*,' and to the 12th, 'Observations on a Viper found in Cranborne Chace, Dorsetshire,' which he presumed to be *Coluber Chersea*, L. In addition to his skill in the use of the pencil, he was an accomplished musician, and devoted much of his time to antiquarian research, as well as to the prosecution of Natural and Experimental Philosophy.

Mr. Rackett became a Fellow of the Linnean Society in 1795, and of the Royal Society in 1803. In the year 1780 he was instituted to the Rectory of Spettisbury and Charlton, in the county of Dorset, and died on the 29th of November last, at the advanced age of 85, after an incumbency of more than sixty years.

The Rev. John Revett Sheppard, M.A.

Lord Viscount Valentia.

Nicholas Aylward Vigors, D.C.L., F.R.S., M.R.I.A., &c., one of the most eminent ornithologists of the present day, was born in 1787 at Old Leighlin, in the county of Carlow, where his family had long been settled. He was educated at Trinity College in the University of Oxford, and gave early proof of the diligence and success with which he pursued his classical and literary studies, by publishing in 1810 'An Enquiry into the Nature and Extent of Poetick Licence.' Towards the close of 1809 he purchased an Ensigny in the Grenadier Guards, and was severely wounded in the action at Barrosa, in the early part of 1811. On his return to England in the same year he quitted the army, and for the next twenty years devoted himself to the study of Zoology, and especially of birds and insects. In both these departments he formed extensive collections, and at a subsequent period liberally presented them to the Zoological Society, of which he was the first Secretary and one of the most zealous and active promoters. On the death of his father he succeeded to the family estate, and in 1832 became the representative in Parliament of the borough of Carlow, for which, or for the county of the same name, he continued to sit until the termination of his life on the 26th of last October.

Mr. Vigors became a Fellow of this Society in 1819, and is author of an important paper in the 14th volume of our Transactions, 'On the Natural Affinities that connect the Orders and Families of Birds.' In this elaborate memoir he applied to the whole Class of Birds the principles of the quinary arrangement propounded by Mr. W. S. MacLeay in the 'Horæ Entomologicæ,' of which he continued through life to be one of the most ardent supporters. In the succeeding volume he published, in conjunction with Dr. Horsfield, the first part of 'A Description of the Australian Birds in the collection of the Linnean Society, with an attempt at arranging them according to their Natural Affinities,' in which the same principles were further developed and applied to the illustration of the Raptorial and Insectorial Orders. His only other contribution to our Transactions consists of a 'Description of a new Species of *Scolopax* lately discovered in the British Islands; with Observations on the *Anas glocitans* of Pallas, and a description of the Female of that Species,' contained in the 14th volume.

The first of his papers in the 'Zoological Journal' appeared in 1824; in 1827 he became its principal editor, and so continued until its termination in 1834. Of his numerous ornithological memoirs published in that work, perhaps the most important is his 'Arrangement of the Genera of Birds;' which, although scarcely more than a bare enumeration of names, contains the most complete outline of his views on the subject of classification. Some of his notices in the 'Zoological Journal' are on Entomological subjects; and several valuable papers, written in conjunction with Dr. Horsfield, are descriptive of new or rare Mammalia in the collection of the Zoological Society. For several years before his death the active part which he took in politics precluded his paying much attention to Zoology, but he retained to the last a considerable interest in his former pursuits, especially in connexion with the Zoological Society. He contributed many valuable notices to the 'Proceedings' of that Society.

Major-General Viney.

Robert Montague Wilmot, M.B.

Rev. William Wood, B.D., and

Francis Boucher Wright, Esq.

Among the *Associates*

Henry Woods, Esq., a surgeon, formerly resident at Bath, and subsequently at Camden Town, near London, who was well versed in the study of the Mammalia, a 'Natural History' of which he was for many years engaged in preparing for the press. This work,

which was intended to be on a very extensive scale, has never appeared. He was author of 'An Introductory Lecture on the Study of Zoology,' of a memoir 'On a new Species of Antelope,' in the 5th volume of the 'Zoological Journal,' and of one or two notices in the 'Proceedings of the Zoological Society.' A few years before his death he quitted the neighbourhood of London and returned to Bath, where he became Secretary to the Literary Institution, and died on the 18th of August last, at the age of 46.

The President also announced that twelve Fellows, three Foreign Members, and two Associates had been elected into the Society since the last Anniversary.

At the election, which subsequently took place, the Lord Bishop of Norwich was re-elected President; Edward Forster, Esq., Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out, viz. Sir Wm. Jackson Hooker; Joseph Janson, Esq.; The Most Honourable the Marquis of Northampton; John Parkinson, Esq.; and John Obadiah Westwood, Esq.

June 1.

Mr. Forster, V.P., in the Chair.

Read the conclusion of Mr. Bunbury's "Remarks on certain Plants of Brazil, with descriptions of some which appear to be new."

The following are the characters of the species described as new:

Lasiandra calyptrata, ramis teretibus ferrugineo-tomentosis, foliis petiolatis ovato-oblongis acutis 5-nervibus subsetoso-hirsutis subtùs dense villosis, racemis terminalibus paucifloris, pedicellis oppositis 1-3-floris, bracteis hispido-pilosis convolutis calyptriformibus, calyce sericeo, filamentis styloque hirsutis.

Hab. prope Gongo Soco, in prov. Minas Geraes.

Clidemia ? glabrata, ramulis subtetragonis glabris, foliis petiolatis oblongo-lanceolatis subcordatis acuminatis serrulato-ciliatis 5-nervibus utrinque glabris: petiolis ciliatis, paniculâ terminali trichotomâ divaricatâ glabrâ, floribus verticillato-aggregatis sessilibus ebracteatis, petalis lanceolatis.

Hab. prope Gongo Soco, in prov. Minas Geraes.

Clidemia deflexa, ramis subtetragonis petiolis paniculisque setoso-hispidissimis, foliis ovatis acuminatis quintuplinervibus subdenticulatis cili-

atis utrinque hispidis, paniculâ terminali elongatâ oppositè ramosâ flexâ nutante, floribus ad ramulorum apices congestis ebracteatis, lobis calycinis obtusis concavis dorso appendiculatis.

Hab. prope Gongo Soco.

Cremanium ? *cordifolium*, undique glanduloso-pilosissimum, foliis petiolatis latè cordatis acuminatis inæqualiter denticulatis ciliatis sub-7-nerviis, paniculâ subterminali nutante laxâ oppositè ramosâ, calyce subrotundo-turbinato : lobis subulatis, petalis lanceolatis acuminatis.

Hab. prope Gongo Soco.

Hiræa cinerea, foliis lanceolatis acutis supernè glabris subtùs fructibusque adpressè sericeo-pilosis canescentibus, paniculâ terminali trichotomâ foliosâ, calycibus eglandulosis adpressè pilosis, fructus alis semiorbiculatis crenatis undulatis.

Hab. in sylvis montis Corcovado prope Rio de Janeiro.

Tetrapteris mutabilis, ramis paniculisque velutino-tomentosis, foliis obovato-ellipticis obtusis rugosis utrinque tomentosis : petiolis apice biglandulosis, paniculâ terminali laxâ divaricatâ multiflorâ, alis fructus inæqualibus.

Hab. in sylvis montis Corcovado.

Abutilon benedictum, ramis sulcatis petiolis pedunculis calycibusque floccoso-tomentosis, foliis lanceolatis acuminatis basi acutiusculis obtusè serratis rugosis suprâ glabris subtùs incano-velutinis, pedunculis axillaribus unifloris folium æquantibus.

Hab. in sylvis cæduis (*capoeiras* dictis) prov. Minas Geraes.

Rubus longifolius, caule angulato petiolis pedunculisque densissimè glanduloso-setosis aculeatis, foliis quinato-palmatis : foliolis petiolatis oblongo-lanceolatis acuminatis basi subcordatis argutè serratis utrinque glabris, stipulis setaceis, calyce subsericeo-tomentoso reflexo.

Hab. prope Gongo Soco.

Lupinus nitidissimus, suffruticosus erectus ramosus aureo-sericeus, foliis simplicibus ovatis acutis, stipulis petiolo adnatis breviter acuminatis, racemis subterminalibus elongatis, floribus verticillatis, calycis labiis integris : inferiore elongato.

Hab. in campis altis prov. Minas Geraes, prope Capao et Ouro Preto.

Achyranthes paludosa, caule herbaceo subramoso fistuloso, foliis obovato-lanceolatis acutiusculis glabris, pedunculis axillaribus folium subæquantibus, spicis abbreviatis capitatis glaberrimis.

Hab. prope urbem Buenos Ayres.

Desmochæta ? *sordida*, caule herbaceo prostrato ramosissimo lanato, foliis subrotundis mucronulatis in petiolum attenuatis glabriusculis, capitulis sessilibus axillaribus ovatis, calycis foliolis 3 exterioribus majoribus ; interioribus carinatis conniventibus : setis uncinato-barbatis.

Hab. ad vias prope urbem Buenos Ayres.

Schultesia pallens, culmo erecto subramoso, foliis ovatis ellipticisque acutiusculis: summis lineari-lanceolatis acuminatis, floribus terminalibus subsolitariis, alis calycis dilatatis semiovatis, corollæ laciniis obovato-rhombeis breviter acuminatis integerrimis.

Hab. prope Gongo Soco in prov. Minas Geraes.

Solanum graveolens, suffruticosum inerme glanduloso-pilosum viscosum, foliis pinnatis: foliolis petiolulatis oblongo-lanceolatis acuminatis membranaceis, racemis longè pedunculatis multifloris subcorymbosis unilateralibus, corollâ quinquefidâ.

Hab. prope Gongo Soco.

Solanum reptans, herbaceum inerme hispido-hirsutum, foliis pinnatis: foliolis petiolulatis oblongis subacuminatis: petiolis alatis, racemis lateralibus folio brevioribus, caule prostrato radicante.

Hab. prope Gongo Soco.

Mr. Bunbury believes *Lasiandra fissinervia*, DeC., to be merely a variety of *L. Fontanesiana*; and *Clidemia urceolata* and *C. biserrata* to be one species. He describes variations in character occurring in *Lasiandra proteæformis*, DeC., *Clidemia urceolata*, DeC., *C. longibarbis*, DeC., *Tetrapteris acutifolia*, Cav., *Bignonia venusta* and *Neurocarpum angustifolium*, Kunth. He thinks it possible, however, that his plant may differ from the latter, as the flowers are resupinate, a character which could hardly have escaped M. Kunth; he therefore proposes for it the following character, should it prove to be distinct:—

Neurocarpum resupinatum, frutescens erectum, foliis trifoliolatis: foliolis ellipticis oblongisque retusis mucronulatis suprâ glabris subtùs pallidis pilosiusculis, pedunculis subbifloris folio brevioribus, floribus resupinatis.

Hab. ad Botafogo, prope Rio de Janeiro.

Specimens of the plants noticed in this memoir were included in a collection presented to the Society by Mr. Bunbury some years ago.

Read also a “Synopsis of the Coleopterous family *Paussidæ*, with descriptions of a new Genus and some new Species.” By J. O. Westwood, Esq., F.L.S.

This paper contains a brief enumeration of the species of the remarkable family of *Paussidæ*, with some additions and corrections to Mr. Westwood’s Monograph of it, published in the 16th volume of the Society’s Transactions.

He proposes to exclude from the family the genus *Trochoideus*, an examination of the cibarian organs having proved that genus to belong to the *Endomychidæ*; and states that he is now acquainted with four, if not five, species belonging to it, viz. 1. *Troch. cruciatus*, Dalm.; 2. *T. Dalmanni*, Westw.; 3. *T. Desjardinsii*, Guér.; 4. *T. Americanus*, Bucqu.; and 5.? *T. Hopei*, Westw. The last-named spe-

cies he has seen in Mr. Hope's collection: it is from New Grenada, and is possibly identical with *T. Americanus*.

Mr. Westwood gives the following as a synopsis of the genera belonging to the family in its present state:—

Antennæ quasi biarticulatæ.

Caput thorace haud immersum, collo distincto, ocellis nullis.

Palpi labiales articulo ultimo elongato 1. *Paussus*.

— — — — — articulis æqualibus 2. *Platyrhopalus*.

Caput thorace immersum ocellis duobus 3. *Hylоторus*.

Antennæ quasi sextarticulatæ.

Prothorax angulis anticis valdè productis..... 4. *Pentaplatarthrus*.

— — — — — transversus, angulis anticis rotundatis, posticis valdè emarginatis..... } 5. *Lebioderus*.

— — — — — truncato-cordatus 6. *Ceratoderus*.

Antennæ quasi decemarticulatæ..... 7. *Cerapterus*.

1. PAUSSUS, Linn.

Sect. A. Thorax quasi bipartitus.

a. Antennarum clavâ posticè haud excavatâ.

1. *P. microcephalus*, L. Africa?
2. *P. Jousselinii*, Guér. Rangoon.
3. *P. Linnæi*, Westw. Habitat unknown.
4. *P. Burmeisteri*, Westw. Cape of Good Hope.
5. *P. rufitarsis*, Westw. Habitat unknown.
6. *P. pilicornis*, Donovan. Bengal.
7. *P. Turcicus*, Frivaldsk. Balkan Mountains.

b. Antennarum clavâ posticè excavatâ.

8. *P. thoracicus*, Donovan. Bengal.
9. *P. Fichtelii*, Donovan. Bengal.
10. *P. fulvus*, luteo-fulvus subopacus, elytris magis rufescentibus, antennarum articulo basali thoracis lateribus posticè femoribusque obscurioribus, capite suprâ profundè impresso.—*Long. corp. lin. 3.*

Hab. in Indiâ Orientali.

11. *P. tibialis*, castaneus nitidus, elytris singulis plagâ magnâ nigrâ, tibiis 4 anterioribus elongatis; posticis multò latioribus compressis, antennarum clavâ posticè profundè excavatâ.—*Long. corp. lin. 2¾.*

Hab. in Bengalâ. In Mus. D. Westermann.

12. *P. excavatus*, Westw. Senegal.
13. *P. ruber*, Thunb. Cape of Good Hope.
14. *P. cochlearius*, Westw. South Africa.
15. *P. Klugii*, Westw. Cape of Good Hope.

Sect. B. Thorax subcontinuus.

a. Species Africanæ.

16. *P. sphærocerus*, Afzel. Sierra Leone.

17. *P. armatus*, Dej.; *P. cornutus*, Chevrol. Senegal.
 18. *P. curvicornis*, Chevrol.; *P. cornutus*, var.?, Chevrol. Senegal.
 19. *P. Shuckardi*, Westw. South Africa.
 20. *P. lineatus*, Thunb. Cape of Good Hope.
 21. *P. affinis*, Westw. On the authority of the British Museum Catalogue Mr. Westwood is now enabled to give Africa as the habitat of this species; but he suggests that there may be some mistake as to locality, and that the insect may really be Indian, and not specifically distinct from the following, *P. cognatus*.

b. Species Indicæ.

22. *P. cognatus*, rufo-castaneus nitidus punctatus, elytris singulis plagâ magnâ nigrâ, capite anticè lineâ tenui impressâ: vertice impressionibus duabus semicircularibus, antennarum clavâ subovatâ basi extûs in hamum productâ.—*Long. corp. lin. 4.*
Hab. in Bengalâ. In Muss. D. D. Melly et Westermann.
 23. *P. Hardwickii*, Westw. Nepaul.
 24. *P. Saundersii*, fulvo-rufescens subnitidus punctatus, capite thoraceque obscurioribus, antennarum clavâ oblongo-ovatâ basi extûs in hamum setigerum productâ.—*Long. corp. lin. 3½.*
Hab. in Indiâ Orientali. Mus. D. W. W. Saunders.
 25. ——— (Sp. ined.), Latr. Isle of France.
Obs. *P. ruficollis*, Fabr., is given by Dr. Erichson as one of the *Malachii*, and as identical with his *Collops 4-maculatus*.

2. PLATYRHOPALUS, Westw.

- 1 (26). *P. denticornis*, Westw. East Indies.
 2 (27). *P. unicolor*, Westw. East Indies.
 3 (28). *P. acutidens*, Westw. Nepaul.
 4 (29). *P. Westwoodii*, Saund. East Indies.
 5 (30). *P. angustus*, Westw. East Indies.
 6 (31). *P. Melleii*, Westw. Malabar.
 7 (32). *P. aplustrifer*, Westw. Bengal. Certainly belonging to this genus.
 8 (33). *P. ? lævifrons*, Westw. Senegal.
 9 (34). *P. ? dentifrons*, Westw. Senegal.

3. HYLOTORUS, Dalm.

- 1 (35). *H. bucephalus*, Gyll. Sierra Leone.

4. PENTAPLATARTHUS, Westw.

- 1 (36). *P. pausoides*, Westw. South Africa.

5. LEBIODERUS, Westw.

- 1 (37). *L. Goryi*, Westw.

6. CERATODERUS.

Corpus oblongum, depressum. *Caput* transverso-quadratum, posticè collo instructum, disco inter oculos bi-impressum. *Antennæ* quasi 6-articu-

latæ, articulis 4 intermediis transversis planis, ultimo semiorbiculari. *Maxillæ* minutæ, planæ, corneæ, apice acutæ curvatæ, intus sub apice dente acuto armatæ. *Palpi maxillares* 4-articulati, articulo magno ovato, 3tio 4toque minoribus subcylindricis; *labiales* articulo ultimo præcedente haud multò majori ovato apice truncato. *Prothorax* capite vix latior, cordato-truncatus, trans medium lineâ impressâ notatus. *Elytra* oblongo-ovata, depressa. *Pedes* breviusculi; femoribus tibiisque compressis, his apice haud calcaratis; tarsis distinctè 5-articulatis, articulo basali sequenti longiore.

1 (38). *C. bifasciatus*.

Paussus bifasciatus, *Kollar in Ann. Wien. Mus.* 1836, t. 31. f. 7. a, b;
Westw. in Trans. Ent. Soc. ii. p. 91. pl. 10. f. 3.

Hab. in Indiâ Orientali.

7. CERAPTERUS, Swederus.

1 (39). *C. latipes*, Swed. Bengal.

2 (40). *C. Horsfieldii*, Westw. Java.

3 (41). *C. 4-maculatus*, Westw. Java.

4 (42). *C.* (ORTHOPTERUS) *Smithii*, MacL. South Africa.

5 (43). *C.* (ARTHROPTERUS) *MacLeaii*, Donovan. New Holland.

6 (44). *C.* (PHYMATOPTERUS) *piceus*, Westw. New Holland.

7 (45). *C.* (HOMOPTERUS) *Brasiliensis*, Miers. Brazil.

8 (46). *C.* (PLEUROPTERUS) *Westermanni*, Westw. Java.

June 15.

The Bishop of Norwich, President, in the Chair.

The President nominated the four following Members of the Council to be Vice-Presidents for the year commencing on the 25th of May last, viz. Robert Brown, Esq., Edward Forster, Esq., Thomas Horsfield, M.D., and Aylmer Bourke Lambert, Esq.

Read, an Extract from a Letter from William Griffith, Esq., F.L.S., to R. H. Solly, Esq., F.L.S., dated Meerut, March 29, 1841.

Mr. Griffith states, that in its placentation, ovula, and protrusion of the embryony sac, *Osyris* approaches *Santalum*, but presents in some particulars still more curious anomalies. First, the embryony sac of *Osyris* seems to be produced beyond the base of the ovulum, passing down through the placenta and through the central tissue of the young fruit to its base. Secondly, the first steps of the growths consequent on fecundation take place outside the protruded

sac, which may be found unaltered in the placenta of the ripe fruit. Whether the first cells, constituting the rudiments of the part in which albumen is subsequently deposited, are derived from the *boyau* or from the embryonary sac, Mr. Griffith states, that he has not been able to determine; but he imagines that they are derived from the *boyau*. He adds, that if his views of the seed of *Loranthus* being derived from the *boyau* solely be correct, *Osyris* is intermediate between *Loranthus* and *Santalum*; and intimates his intention of sending, on his arrival at Calcutta, a Supplement to his paper on *Loranthus*, published in the Society's Transactions.

Read also a paper "On a reformed character of the genus *Cryptolepis* of Brown." By H. Falconer, M.D., Superintendent of the Hon. East India Company's Botanic Garden at Saharunpore.

Dr. Falconer's character is as follows:—

CRYPTOLEPIS, R. Br.

Calyx 5-partitus. *Corolla* infundibuliformis, 5-fida; tubo intus processibus 5 carnosus, obtusis, inclusis, cum limbi laciniis alternantibus, instructo; fauce nudâ. *Stamina* imo corollæ tubo inserta, inclusa; *filamenta* brevissima, distincta; *antheræ* sagittatæ, dorso penicillato-barbatæ, basi stigmatis margini adhærentes. *Massæ pollinis* solitariæ, granulosæ, corpusculi glandulæformis appendiculæ lineari tenuissimæ applicitæ. *Ovaria* 2. *Stylus* brevissimus. *Stigma* dilatatum, margine attenuatum, apiculo conico. *Squamulæ hypogynæ* nullæ. Folliculi divaricatissimi, ventricosi, apice acuto recto. *Semina* ad umbilicum comosa.

Frutex *volubilis, glaberrimus, succo lacteo scatens; foliis oppositis, brevè-petiolatis, lato-ellipticis cum acumine subulato brevi, suprâ latè-virentibus, subtùs albido-glaucis, transversè venosis; petiolis supra basin articulatis; corymbis axillaribus, brevè-pedunculatis, curtatis; floribus subsessilibus, majusculis, citrinis; corollæ limbo patulo, segmentis ligulatis.*

C. Buchanani, Rœm. et Sch., iv. p. 409.

C. reticulata, Royle, *Illustr.*, p. 270.

Nerium reticulatum, Roxb. *Flor. Ind. Orient.*, ii. p. 9.

Hab. passim in Indiâ Orientali.

In his Monograph in the Wernerian Transactions, Mr. Brown referred the genus *Cryptolepis*, which he there established, to *Apocynæ*, placing it next to *Apocynum*, and in this he has been followed by all subsequent writers; but Dr. Falconer states that it has the whole stigmatic apparatus of *Asclepiadæ*, with granular pollen as typically developed as in *Cryptostegia* or any other of the *Periploceæ*, although in a less considerable degree of evolution. He regards it, however,

as constituting the closest known transition from that family to *Apo-cynea*. He thinks the extreme minuteness of the appendiculæ may account for their having escaped Mr. Brown's observation in the dry specimen; but adds, that there are two other points of difference, which lead him to suspect his plant to be distinct from that described by Mr. Brown. These are the want of hypogynous scales, of which he finds no trace, and which he believes to be wanting in the series of Periploceous genera allied to *Cryptolepis*; and the axillary, and not interpetiolar, inflorescence. He also gives a detailed description of the sexual organs, and states that he has never been able to observe the pollen tubes either naturally or artificially produced.

In a supplementary note, Dr. Falconer adds, that he has since learned by letters from Dr. Wight and Mr. Griffith, that both those gentlemen have been long aware of *Cryptolepis* being an Asclepiadeous genus. With reference to Dr. Wight and Mr. Arnott's genus *Streptocaulon*, under which those authors include the mass of Dr. Wallich's Indian species of *Periploca*, he observes, that *S. calophyllum* wants the principal character on which the distinction of that genus from *Periploca* is founded, and suggests its restoration to *Periploca*, of which he also characterizes a new species from the neighbourhood of Cashmeer with a peculiar pseudo-aphyllous habit. Of these species he gives the following characters:—

P. calophylla, volubilis glabra, foliis angustè lanceolatis longè attenuatis utrinque nitidis transversè venosis, cymis sessilibus paucifloris, floribus breviter pedicellatis, corollis intus parè hirsutis, squamis hirsutissimis, folliculis elongatis gracilibus subparallelis (nec divaricatis!).

Streptocaulon calophyllum, *Wight, Contr. Ind. Bot.*, p. 65.

Hab. passim in vallibus exterioribus montium Himalensium.

P. Hydaspidis, volubilis ramosissima glabra, ramis fasciculatis nodosarticulatis, foliis tenuissimis linearibus apiculatis adpressis remotis caducis, cymis axillaribus multifloris, floribus breviter pedicellatis, corollâ intus squamisque tomentosis.

Hab. secus ripas Hydaspidis extra Kashmeer prope "Khutao Kelah."—*Fl.* Septembri.

The paper was accompanied by a coloured drawing of *Cryptolepis Buchanani*? var. *reticulata*, and of the details of its fructification.

Read also, "A Description of an additional species of *Paussus*." By J. O. Westwood, Esq., F.L.S., &c.

The following are the characters of this species, which Mr. Westwood states to be most nearly allied to *P. ruber*, Thb., and of which he has seen only a single specimen in the collection of Samuel

Stevens Esq. was obtained together with specimens of *Platyphajus denticornis* and *P. gibbistrifer* in a small collection of Indian insects without any indication of its precise locality.

Famma Scopulorum, pulch. Juss. cupis rugosior tuberculis P elevatis inter setas articulationum clav. magna pedice elongato. Elytris vixtus micen fasciulis fuscis nervis plurim. intricatis.

November 1

The Bishop of Norwich, President in the Chair.

The Hon. William Henry Dawson M.P. and Samuel Solly Esq. were elected Fellows of the Society.

Read "Notes on the Habits of the Box-Tortoise of the United States of America, the *Caretta Carolina* of Gray." By George Ord, Esq. F.L.S.

Mr Ord states that this species is common in Pennsylvania, and appears to prefer dry situations, only frequenting the wet in pursuit of some favourite food, such as the remains of fish which he scatters under the trees in swamps where the Night-heron *Nycticorax* L. breeds. It feeds also on insects, worms and tender fungi, and eats greedily of strawberries, raspberries and soft peaches. Its flesh is excellent, but the farmers have the same prejudice against it as against that of frogs. It hibernates about the middle of October, preferring a loose soil and southern exposure, and in severe winters some individuals perish in consequence of not having penetrated to a sufficient depth to escape the frost. About the 20th of April the survivors reappear in a feeble state, until invigorated by the returning warmth.

Mr Ord kept a number of these Tortoises for several years in his garden, where they had an ample range, abundance of suitable food, and convenient places of winter retreat. They regularly deposited their eggs, but seldom produced young, a circumstance which he attributes to the destruction of the eggs by ants. He gives from his books of memoranda the details of observations made in the years 1814 and 1815 on their mode of laying and depositing their eggs, and the circumstances attending their hatching.

The earliest deposit observed took place on the 22nd of June 1814. The Tortoise scoured out the earth with her hinder feet, using them

alternately as deep as she could reach when the earth at the bottom of the hole was loosened. The first egg was secured in this loose earth, and five other eggs were laid and deposited in the same manner at intervals of four or five minutes, the earth being scraped from the sides of the hole and carefully pressed upon each egg as it was deposited, and the hole itself being finally covered over with the loose earth carefully packed and pressed. The animal kept in one position during the whole process, not looking once at the deposit. The eggs appeared to pass with facility and shortly after laying the last egg she uttered a guttural sound several times repeated. The number of eggs appears to vary from three to six.

In June 1840 Mr. Ord removed his observations. Two of the female Tortoises then in his possession having been disturbed when about to lay, abandoned the place one of them did on the subsequent day, and the other not until the second day after whence Mr. Ord concludes that they possess the power of retaining their eggs under certain circumstances. The eggs were always laid about or after sunset, and some of the Tortoises if not all, laid twice during the season. Of a deposit made on the 29th of June, one of the eggs (that nearest the surface) was hatched on the 14th of September. On struggling out of the shell the young animal seemed to be almost blind, its nose was very soft and cartilaginous, and in the centre of the under shell, or between the abdominal and the femoral shields, there was a large umbilical process. It measured an inch in length and could crawl with ease. On the 14th of October another young Tortoise made its appearance from the same deposit: it was larger and larger than that first hatched, measuring an inch and three-quarters in length, and its eyes were completely open. Mr. Ord conjectures that it had emerged from its shell some days previously, but had only then made its way to the surface. On the 17th another made its appearance, of a size between the other two, and on the same day Mr. Ord inspected the deposit and found a fourth young one, still in its shell, but struggling to get free, in which it succeeded during the afternoon. It was rather larger than any of the rest, and had remained in the shell one and twenty days longer than the first. On the 29th of September, Mr. Ord examined a deposit of eggs laid on the 29th of June. None appeared to have hatched, but the shell of the uppermost having been partly eaten by the ants, he opened it and found a perfectly formed fetus, measuring an inch in length, attached to a yolk-bag three-quarters of an inch long. On the 21st of October Mr. Ord examined one of a number of eggs which he had removed from their

deposits on the 24th of September, and found it to contain a living young, not quite so large as that last mentioned, and having a much larger yolk-bag; and on the 1st of December he took up all the eggs of which he had any knowledge, none of which (although some were still living) were sufficiently matured for exclusion; a circumstance which he attributes to a deficiency of the usual summer heat and to severe early frosts. Of the four young ones hatched, one escaped; and the remaining three hibernated with the adults, reappeared in the spring, and lived in the garden for several years.

November 16.

E. Forster, Esq., V.P., in the Chair.

Sir Oswald Mosley, Bart., was elected a Fellow.

Read, "Descriptions of some Vegetable Monstrosities," by the Rev. William Hincks, F.L.S., F.R.S.E., &c.

In this paper, which is a continuation of one read before the Society towards the close of the year 1839, Mr. Hincks arranges the monsters described by him under the several heads of adherences, transformations, and increased or diminished developments of particular parts.

The adherences comprise, first, a case of the union of five grapes into one fruit in so complete a manner as to render it probable that the flowers were also united; secondly, an instance of cohesion between four peduncles of *Centaurea moschata*, without fusion of their capitula; and thirdly, the common case of adherence of two flowers of *Fuchsia fulgens*. The latter is introduced for the purpose of remarking how frequently, when the usual number of organs in a circle results from the suppression of certain parts rudimentally present, the same cause which produces adherence with the nearest flower, also develops all the rudiments, and thus increases the number of parts. On the other hand, in cases of union by fusion, that is, where the united flowers form one enlarged flower, Mr. Hincks observes, that one organ at least is generally sacrificed at each point of junction.

Of transformations Mr. Hincks notices two: first, a terminal bud of an *Azalea*, gathered about the period when the plant ceased to produce blossoms, which is partially converted into a flower, the

leaves nearest the centre being imperfectly changed into stamina, and surrounded by many of petaloid aspect, while the outer leaves differ from the ordinary appearance only in having a little colour; the organs are not arranged in circles, and one leaf only, and that among the most remote from the centre, assumes the form of a pistillum. The second transformation described occurs in a specimen of *Gentiana campestris*, in which all the parts of the flower are converted into leaves, which are somewhat petaloid and crowded into a rose-like tuft: this kind of transformation is similar to that described and figured by M. De Candolle in *Trifolium repens*.

The first case of increased or diminished development noticed by Mr. Hincks affects a specimen of *Anagallis arvensis*, resembling one described by M. Moquin-Tandon as found by M. Gay, in which an increased development of the exterior circle is accompanied by diminution in the interior ones: the effect produced is stated to be very unequal in different flowers, but the more the calyx is enlarged, the more the interior circles are contracted. The second case is the well-known wheat-ear carnation, *Dianthus Caryophyllus imbricatus*, L., which is noticed as probably affording the best example of the monstrous multiplication of a particular circle. A third case occurs in a capitulum of *Matricaria*, in which the bracteæ, consisting under ordinary circumstances of paleaceous scales, are enlarged into full-sized leaves, completely deforming the flower: the rose-ribwort is noticed as a phænomenon of the same kind. Fourthly, Mr. Hincks mentions a monstrous variety or highly developed form of *Convallaria multiflora*, cultivated at Kew, which he presumes to be the *var. bracteata* of De Candolle and Duby: in it the number of flowers usually reaches five or six, and each of them proceeds from the axilla of a small leaf on the pedicel. And lastly, the author notices under this head a case of abortion or atrophy affecting the leaf of a fern cultivated by Messrs. Rolleston, by which in one instance the whole side of a frond, and in another the secondary veins with the parenchyma at both sides are entirely suppressed; a phænomenon which he has also observed in *Scolopendrium officinale*.

Read also the commencement of a paper "On the Influence of the Dew-point on the Temperature of Plants," by D. P. Gardner, M.D., of Hampden Sidney College, Virginia, communicated by the Secretary.

December 7.

R. Brown, Esq., V.P. in the Chair.

Mr. John Brett was elected an Associate.

Read, "On the Structure of the Nut known as Vegetable Ivory,"
by Daniel Cooper, Esq., A.L.S.

Read also the conclusion of Dr. Gardner's paper "On the Influence of the Dew-point on the Temperature of Plants."

December 21.

E. Forster, Esq., V.P., in the Chair.

The following Addresses of Congratulation to Her Majesty and His Royal Highness Prince Albert were read and agreed to:—

"To the Queen's most Excellent Majesty.

"Most Gracious Sovereign,

"We, Your Majesty's most loyal and dutiful subjects, the President, Council, and Fellows of the Linnean Society of London, beg leave to approach the throne with the expression of our warmest congratulations on the auspicious birth of an Heir Apparent to the Crown of these realms.

"Deeply impressed with feelings of loyal attachment to Your Majesty's person, we hail this event as an important addition to Your Majesty's domestic happiness and a renewed pledge of the permanence of Your Majesty's illustrious House. That Your Majesty may long, in the enjoyment of every blessing, reign over a grateful people; and may, at a far distant time, transmit to Your Majesty's successor the best inheritance of a prince in the affections of a loyal and devoted nation, is our most earnest prayer."

"To His Royal Highness Prince Albert of Saxe-Coburg and Gotha.

"May it please Your Royal Highness,

"We, Her Majesty's most loyal and dutiful subjects, the President, Council, and Fellows of the Linnean Society of London, beg leave to offer to Your Royal Highness our warmest congratulations on the birth of an Heir Apparent to the Throne of these realms.

"Deeply impressed with feelings of loyal attachment to Her Majesty's person, we hail this event as an additional source of

domestic happiness to Her Majesty and Your Royal Highness, and as a pledge of the permanence of Her Majesty's illustrious House. That Her Majesty and Your Royal Highness may long enjoy every blessing that can attend the married state, is our most earnest prayer."

The Secretary announced to the Society, that since its last meeting it had sustained a severe loss by the death of its Librarian, Professor Don, which took place at the Society's House on the 8th instant.

Read an extract of a letter from William Griffith, Esq., F.L.S., to R. H. Solly, Esq., F.L.S., dated Serampore, the 11th of October 1841, containing the following observations:—

"In *Santalum* the ovulum consists of a nucleus and an embryo-sac, prolonged both beyond the apex and base of the nucleus; the albumen and embryo are developed in the exerted part above the septum; the mass of the embryo is developed directly from the vesicle, which is the termination of a pollen tube; the seed (albumen) has no other proper covering than the incorporated upper separable part of the embryo-sac.

"In *Osyris* the ovulum is reduced to a nucleus and an embryony sac, prolonged exactly in the same directions as in *Santalum*, but not to such a degree anteriorly; this anterior portion resembling exactly the unchanged part of the sac of *Santalum* below the septum. The albumen and embryo are formed outside the sac, and are absolutely naked, or whatever covering they may have did not enter into the composition of the ovulum."

Mr. Griffith adds, "I have lately looked at *Isoetes capsularis*, Roxb.; it is an instructive plant, for it shows that botanists are mistaken in their supposition as to the male. In Roxburgh's plant the contents of the sporangium are sometimes of two sorts, but both have the same origin, both are precisely similarly constituted, except perhaps as to contents; and the largest of these, the males of authors, become afterwards like the others, but larger. There can be no doubt that in all these plants the true sporules or seeds are those produced by division of an original simple cell or its contents. *Isoetes* and *Azolla* prove too a thing of some importance, that the dissimilar organs which have so puzzled botanists may have a similar origin. The true male of *Isoetes* will probably turn out to be the oblong, cordate, fleshy laminæ above the female. On the male my observations were stopped by indisposition. As a male it is certainly ano-

malous ; it is probably, I conjecture, developed originally within the leaf, and the scale between it and the female is probably analogous to the indusium of ferns. The most instructive plant is *Anthoceros* (which is not a *Hepatica*), for this may explain Ferns by showing that a pre-existing organ, to be acted upon by the male influence, is not necessary. Endlicher says *Isoetes* has no stomata ; De Candolle figures them in his 'Organographie ;' in *I. capsularis* they are very evident : no matter whether emerged or submerged, all plants having a cutis have stomata."

Read also a paper "On a new genus of Plants from Chile." By John Miers, Esq., F.L.S.

This genus, which is named by Mr. Miers *Solenomelus*, on account of the confluence into a tubular form both of the stamina and stigmata, belongs to the natural order *Irideæ*, and is thus characterized :

SOLENOMELUS.

Cruckshanksia, Miers, *Travels in Chile*, ii. p. 529. non Hook.

Perianthium petaloideum ; tubo brevi incurvo ; limbo 6-partito, laciniis patentibus, 3 superioribus erectioribus, 3 inferioribus deflexis. *Tubus stamineus* cum tubo perianthii coalitus, demùm liber, ore antheras 3 sessiles gerens. *Stylus* filiformis. *Stigma* integrum, urceolato-tubulosum, margine ciliatum. *Capsula* triquetra, trilocularis, loculicido-trivalvis.—Herbæ *Chilenses perennes*, habitu *Sisyrinchii*. *Spatha bivalvis*, dorso sub apice mucronata. Flores breviter pedicellati.

1. *Solenomelus Chilensis*, foliis lineari-ensiformibus, corollâ aurantiacâ.

Cruckshanksia graminea, Miers, *Travels in Chile*, ii. p. 529.

Hab. apud Concon, locis umbrosis.

2. *Solenomelus punctatus*, foliis angustioribus, corollâ aurantiacâ ; laciniis singulis supra basin puncto sanguineo notatis.

Hab. prope Concepcion.

Mr. Miers observes, that the curved corolla, the coherence of the filaments throughout their entire length, and the union of the stigmata into an urceolate tube, afford characters that sufficiently distinguish this genus from *Sisyrinchium*, to which it is in other respects most nearly related. In all the species of the latter genus that he has examined he has found a portion of the filaments free ; and he thinks the genus should be limited to those species in which the stamina are only partially united. This would exclude *S. odoratissimum*, Cav. (which is apparently the same as *S. Narcissoides*, Lindl.) and *S. flexuosum*, Lindl., described as having entirely united stamina, and further differing from *Sisyrinchium* in having a long infundibuliform corolla, with more distinct markings, and a very

odoriferous smell. On these species Mr. Miers proposes to found a genus under the name of *Symphystemon*; agreeing with *Solenomelus* in the complete union of its stamina, but differing by its deeply cleft style and the shape of its corolla. He thinks also that several species added to *Sisyrrinchium* by Sprengel, such as *S. collinum*, *S. filiforme* and *S. flexuosum*, should be discarded from it, and believes that the entire genus requires a revision, for which he regrets that he does not possess sufficient materials.

Read also a "Notice of a new species of *Araucaria* from the neighbourhood of Moreton Bay; and of the Germination of *Nuytsia floribunda*," in a letter from J. C. Bidwell, Esq., to R. Taylor, Esq., Under Sec. L.S.

January 18, 1842.

R. Brown, Esq., V.P., in the Chair.

The Secretary reported that the Council held this day had agreed to the following resolution, viz.

"That notice be given at the General Meeting this evening that the Election of a Clerk, Librarian and Housekeeper will take place on the 15th of February; the Chair to be taken at half-past seven o'clock in the evening, and the Ballot to close at nine."

He further reported that the Candidates were Charles M. Lemann, M.D., Fellow of the Royal College of Physicians in London, and Mr. Richard Kippist, Assistant Clerk and Librarian of the Society.

Edward Solly, Jun., Esq., the Rev. Henry Hawkes, B.A., and Dr. William Henry Brown, were elected Fellows.

The Vice-President in the Chair then proposed, that in consequence of the recent death of Aylmer Bourke Lambert, Esq., V.P.L.S., and in consideration of his long connexion with the Society and eminent services to natural history, the meeting should adjourn, which was unanimously agreed to.

February 1.

The Bishop of Norwich, President, in the Chair.

Mr. John William Griffith was elected a Fellow, and Mr. Lovell Reeve an Associate.

Read, "Contributions to Vegetable Embryology, from Observations on the Origin and Development of the Embryo in *Tropæolum majus*." By Herbert Giraud, M.D., communicated by the Secretary.

After referring to the researches of MM. Schleiden, Wydler, Mirbel and Spach, and A. St. Hilaire, on this important point, Dr. Giraud states that he was induced to select *Tropæolum* as the subject of his own observations on account of its solitary ovula, and their comparatively large size, which render the individuals of this family, as well as the allied *Geraniaceæ*, peculiarly fitted for the purpose. He arranges his observations under seven general heads corresponding with as many progressive periods in the growth of the female organs, and extending from the completion of the anatropous development of the ovule to the perfect formation of the embryo; or from the commencement of the expansion of the bud to the complete formation of the fruit. The results are collected from a great number of dissections.

In the *first* period, or just before the expansion of the bud, a longitudinal section of the carpellum from its dorsum towards the axis of the pistillum, dividing the ovule, shows the latter to have completed its anatropous development. A portion of rather firm and dense cellular tissue enclosing a bundle of vessels descends from the placenta and in apposition with it to form the raphe, and terminates in the base of the ovule. The nucleus has only one integument, at the apex of which is the exostome or micropyle, opening close by and to the outside of the point of attachment; and the conducting tissue of the style may be traced into the carpellary cavity as far as the exostome.

In the *second* period, during which the expansion of the bud and the dehiscence of the anthers commence, and therefore before impregnation, a small elliptical cavity makes its appearance near the apex of the nucleus, having a delicate lining membrane formed by the walls of the surrounding cells: this cavity is the embryo-sac, and a minute canal may be traced leading from it to the exostome. The apex of the embryo-sac encloses at this period a quantity of organizable mucilage containing many minute bodies having the appearance and character of cytoblasts.

In the *third* period, the apex of the nucleus and of its integument becomes slightly inclined towards the placenta. The embryo-sac is much enlarged and lengthened; its mucilage has disappeared and given place to an elongated diaphanous utricule (*utricule primordiale*, Mirbel; *vésicule embryonnaire*, Meyen; *extrémité antérieure du boyau pollinique*, Schleiden;) containing a quantity of globular matter or

cytoblasts. This primary utricle is developed wholly within the embryo-sac, from which it is obviously distinct.

The *fourth* period occurs after impregnation. The pollen tubes do not extend into the carpellary cavity; but the fovilla with its granules is found abundantly in the passage leading from the style to the exostome. With the increased development of the embryo-sac, the primary utricle elongates and becomes distinctly cellular by the development of minute cells in its interior, while at the extremity next the base of the nucleus it is terminated by a spherical mass consisting of globular cells. The primary utricle at this period assumes the character of the suspensor (Mirbel), and its spherical extremity constitutes the first trace of the embryo.

In the *fifth* period the apex of the nucleus and of its integument becomes more inclined towards the placenta; the spherical extremity of the suspensor enlarges, and it becomes more evident that it constitutes the rudimental embryo. In the mean time the suspensor has become lengthened by an increase in the number of its cells; and its upper extremity is found to be protruded through the apex of the embryo-sac, the apex of the nucleus and the micropyle. From this extremity there is a considerable development of cells, many of which hang loosely in the passage leading to the conducting tissue of the style, while the rest unite in forming a process which passes down the outer side of the ovulum within the carpellary cavity. This process is composed of from nine to twelve rows of cells, and its extremity resembles in appearance and in the anatomical condition of its cells the spongiole of a root. By a slight traction of this cellular process the suspensor with the embryo may be withdrawn from the embryo-sac through the exostome, thus proving the continuity of the process with the suspensor, and through it with the embryo itself.

During the *sixth* period the suspensor becomes more attenuated; and the cellular process has reached the base of the ovulum, the cells of its extremity abounding with cytoblasts, which prove that it is still progressing in development. The embryo also increases in size, and two lateral processes are observed, which evidently form the first traces of the cotyledons.

In the *seventh* period all distinction between the nucleus and its integument ceases, and they form a single envelope enclosing the embryo-sac; the cellular process has become so much developed, that its extremity has passed round the base of the ovulum and is directed towards the placenta; and the lateral processes of the embryo have become distinct fleshy cotyledons, enclosing both the

radicle and plumule in corresponding depressions of their opposed surfaces. The subsequent changes consist chiefly in the great development of the cotyledons, which ultimately occupy the entire cavity of the nucleus, filling the space usually taken up by albumen.

From these observations Dr. Giraud deduces the following inferences.

The formation of the embryo-sac and the development of cytotlasts within it having been shown to take place at a period prior to impregnation, and even the primary utricle itself making its appearance before the emission of the pollen from the anther and before the expansion of the stigma, the origin of the primary utricle cannot be referred to the influence of impregnation, nor can it have been derived from the pollen tube pressing before it a fold of the embryo-sac.

The primary utricle at its first formation being quite distinct from the embryo-sac, even at its apex (although brought into contact with it at a subsequent period, and ultimately penetrating it), cannot result from a depression or involution of the embryo-sac, as is maintained by M. Brongniart.

The pollen tubes (which after impregnation may be traced in the conducting tissue of the style) never reaching the micropyle, but pollen granules being found in abundance in the channel leading to it, and being doubtless brought into contact with the outer surface of the embryo-sac through the exostome; and the first trace of the embryo appearing at this time in the formation of the spherical body at the inferior extremity of the primary utricle—Dr. Giraud is led to conclude that the origin of this simple spherical body results from a peculiar process of nutrition, determined by the material or dynamic influence of the fovilla, conveyed through the medium of the primary utricle or suspensor.

The paper was accompanied by a series of drawings representing the ovulum of *Tropæolum* in the several stages of development described.

February 15.

R. Brown, Esq., V.P., in the Chair.

The Meeting having been specially summoned for the election of a Clerk, Librarian, and Housekeeper in the place of Professor Don, the Vice-President in the Chair opened the business of the day, and the Members present proceeded to ballot.

The Vice-President appointed Mr. Bentham and Mr. Yarrell to be Scrutators, and the ballot being closed and the votes being counted, the Scrutators reported the election to have fallen on Mr. Kippist, who was thereupon declared to be duly elected.

March 1.

T. Horsfield, M.D., V.P., in the Chair.

The Secretary reported, that since the last meeting the Society had received from W. Borrer, Esq., F.R.S., F.L.S., &c., the present of a valuable Herbarium of Foreign Flowering Plants.

George Gardner, Esq., was elected a Fellow.

Read a paper "On some rare and beautiful Coleopterous Insects from Silhet, the major part belonging to the collection of Frederic Parry, Esq., of Cheltenham." By the Rev. F. W. Hope, F.R.S., F.L.S., &c.

The number of species described amounts to fourteen, one of which is regarded by Mr. Hope as forming the type of a new genus. The following are the generic and specific characters:—

LUCANIDÆ.

Hexarthrius Parryi, niger, mandibulis exsertis subdenticulatis bidentatis, capite thoraceque scabriusculis, elytris posticè castaneis. Long. lin. 36; lat. lin. 10.

Odontolabis Cuvera, ater, mandibulis valdè exsertis denticulatis, elytris pallidè castaneis litterâ V nigrâ signatis. Long. (mandibulis inclusis) lin. 34; lat. lin. 11.

Odontolabis Baladena, niger, mandibulis porrectis multidentatis, capite thoraceque unidentatis. Long. lin. 26; lat. 10.

Dorcas Westermanni, niger, mandibulis porrectis multidentatis capite thoraceque parùm brevioribus. Long. lin. 26½; lat. lin. 9.

Dorcas DeHaani, niger, mandibulis porrectis capite parùm longioribus: dente forti ferè trigono ante basin posito: reliquis minoribus. Long. lin. 22; lat. lin. 7¼.

Hub. in agro Assamensi. Mus. D. Hope.

Lucanus Brahminus, niger, mandibulis valdè exsertis denticulatis capiti thoracique æqualibus, thorace posticè utrinque dentato, elytris glabris marginatis. Long. lin. 24½; lat. lin. 6½.

Lucanus Buddha, niger nitidus, mandibulis valdè porrectis capite thoraceque longioribus denticulatis. Long. lin. 21; lat. lin. 6.

RUTELIDÆ.

Mimela Passerinii, viridis, thoracis lateribus luteolis, elytrorum marginibus elevatis pallidè virescentibus, corpore infrà roseo-cupreo, pectore capillis longis flavescens obsito. Long. lin. $9\frac{1}{2}$; lat. lin. $4\frac{1}{4}$.

Hab. in Montibus Himalayanis.

BUPRESTIDÆ.

Chrysochroa Edwardsii, viridi-aurata, thorace cupreo-purpureo, elytris fasciâ irregulari maculâ flavâ insignitis, corpore subtùs roseo-cupreo, pedibus concoloribus. Long. lin. 27; lat. lin. $8\frac{3}{4}$.

This superb *Buprestis* approaches most nearly to that named *Perrottetii* by M. Guérin.

LONGICORNES.

Monochamus sulphurifer, corpore toto suprâ et infrà flavo-sulphureo, antennis pedibusque nigro cinereoque variegatis. Long. lin. 13; lat. lin. $4\frac{3}{4}$.

Purpuricenus rubripennis, violaceus, elytris rubro-marginatis maculâ subquadrata in medio disco insignitis, pedibus concoloribus. Long. lin. 15; lat. lin. 4.

ZONOPTERUS, Hope.

Caput mandibulis arcuatis, fronte declivi, cornu brevi utrinque ad basin antennarum. *Antennæ* 11-articulatæ, articulo basali apice crassiore, 2do minimo, 3tio longissimo, 4to ferè dimidio minore, 6 sequentibus ferè æqualibus, ultimo longiore acuto. *Thorax* depressus, capite duplò longior. *Elytra* thorace triplò longiora, parallela, apicibus rotundatis. *Pedes* femoribus 4 anterioribus incrassatis, posticis duplò majoribus subcompressis; tibiis posticis subincurvis.

Zonopterus flavitarsis, niger, antennis bicoloribus, thorace nigro-tomentoso, elytris flavo-bifasciatis, femoribus tibiisque atris, tarsis flavis. Long. lin. 15; lat. lin. 4.

Colobothea rubricollis, rubro-picea, antennis concoloribus, elytris nigricantibus maculis flavo-ochraceis aspersis. Long. lin. 15; lat. lin. 4.

SAGRIDÆ.

Sagra Carbunculus, cyanea, elytris igne auroque micantibus, pedibus posticis incrassatis; tibiis incurvis. Long. lin. $4\frac{1}{2}$.

March 15.

E. Forster, Esq., V.P., in the Chair.

Mr. R. H. Solly exhibited a Cabinet for Microscopic objects made of Cedar-wood, the specimens contained in which, consisting of thinly ground sections of fossil-wood cemented on glass, had become co-

vered with a very adhesive varnish. Where the fossil-wood was quite sound, and the cement (probably of Canada Balsam) did not project beyond its edges, very little of the varnish was deposited; but where the fossil-wood was cracked or unsound, or where the cement projected beyond its edges, it was found in considerable quantity; and on the specimens not cemented to glass, it was deposited chiefly in the pores or cracks which had imbibed some of the oil used in polishing the surface. The cabinet was quite new when the specimens were placed in it, and Mr. Solly supposes that the air contained in the drawers had become loaded with vapour from the Cedar-wood, which coming into contact with oil or resin combined with it to produce a varnish.

Read a paper "On *Edgeworthia*, a new genus of Plants of the Order *Myrsineæ*." By Hugh Falconer, M.D., Superintendent of the Hon. E. I. C.'s Botanic Garden at Saharunpore, communicated by J. F. Royle, M.D., F.L.S., &c.

Dr. Falconer refers this new genus to the Tribe *Theophrasteæ*, and characterizes it as follows:—

EDGEWORTHIA.

Calyx 5-partitus; laciniis obtusis imbricatis. *Corolla* hypogyna, subcampanulata; tubo brevi crasso, intus squamis 5 adnatis acuminatis, cum limbi 5-partiti lobis acutis (in æstivatione contorto-imbricatis) alternantibus, instructo. *Stamina* 5, corollæ tubo inserta, ejus denique laciniis opposita, exserta; filamenta subulata, basi cum squamis confluentia; antheræ extrorsæ, versatiles, loculis longitudinaliter dehiscentibus. *Ovarium* 1-loculare; placenta basilaris, parva; ovula pauca, erecta, anatropa. *Stylus* elongatus, etiam in alabastro exsertus; stigma minutum, indivisum. *Drupa* mono- (rarò di-) sperma. *Semen* peltatum, hilo lato excavato umbilicatum; testa ossea. *Embryo* intra albumen (cartilagineum) ruminatum excentricus, transversè arcuatus; radícula infera. -- Arbuscula *sempervirens*; foliis *alternis exstipulatis, solitariis v. fasciculatis, ellipticis, integerrimis, coriaceis, marginatis*; ramis *spinescentibus*; pedicellis *bracteolatis*; floribus *parvis subsessilibus in capitula axillaria subumbellata densè coacervatis, chloroleucis*; drupâ *eduli dulci*.

Obs. Genus inter *Theophrasteas, Jacquiniæ* et *Theophrastæ* juxta characteres tribuales affine, sed ab utroque et a sociis albumine ruminato, necnon inflorescentiâ distinctum. Notatu dignissimum, stylum etiam in alabastro exsertum!

Edgeworthia buxifolia.

Hab. in collibus aridis Provinciarum Taxilæ et Peucelaotis in Bactriâ Inferiore; passim obvenit propè Peshawur, Cohaut et Attock, indigenis

NO. XV.—PROCEEDINGS OF THE LINNEAN SOCIETY.

Goorgoora dicta. Floret Februario; fructus maturescit Julio. Semina dura globosa vulgò in monilia precatória conseruntur.

Dr. Falconer describes *Edgeworthia* as one of the most characteristic forms of Lower Affghanistan, where it grows associated with a species of *Dodonæa*, *Olea Laitoona*, a species of *Rhazya*, and an undescribed Asclepiadeous genus. To the latter, which he refers to the tribe of *Periploceæ*, he gives the name of *Campelepis*, with the following generic characters:—

CAMPELEPIS.

Corolla rotata, 5-fida; fauce coronatâ, squamis 5 cum segmentis alternantibus, brevibus, flexuoso-trilobis, confluentibus, medio aristatis, aristas filiformibus erectis apice uncinatis; tubo intus squamulis totidem inclusis, laceris, patentibus, staminibus oppositis, instructo. *Filamenta* distincta, fauci infra squamas inserta; antheræ sagittatæ, apiculo acuto terminatæ, dorso barbatae, basi stigmatis medio agglutinatæ. *Massæ pollinis* solitariae, granulosae, corpusculorum stigmatis appendiculis dilatatis applicitæ. *Stigma* dilatatum, muticum. *Folliculi* cylindracei, læves, divaricatissimi. *Semina* ad umbilicum comosa.—Frutex erectus, ramosissimus, glaber, quasi aphyllus; foliis nempe squamæformibus, deciduis, remotis; cymis brevè pedunculatis, paucifloris; floribus parvis, coriaceis; corollæ laciniis intus propè apicem barbatis, disco leprosis.

Campelepis viminea.

Hab. passim in Bactriâ Inferiore, propè Peshawur, Attock, &c.

April 5.

R. Brown, Esq., V.P., in the Chair.

The Secretary announced that the Society had received, in pursuance of the bequest of the late Professor David Don, Libr. L.S., his Herbarium and collection of Woods and Fruits, with the exception of such as relate to Materia Medica.

Mr. Richard Kippist, Libr. L.S., was elected an Associate.

Read the commencement of "A Catalogue of Spiders, either not previously recorded or little known as indigenous to Great Britain, with remarks on their Habits and Economy." By John Blackwall, Esq., F.L.S., &c.

April 19.

E. Forster, Esq., V.P., in the Chair.

M. Pakenham Edgeworth, Esq., of the Bengal Civil Service, was elected a Fellow.

The Secretary announced that the Treasurer had received from the Executors of the late Archibald Menzies, Esq., F.L.S., the sum of 90*l.*, being the amount of a legacy of 100*l.* bequeathed by him to the Linnean Society, after deducting 10*l.* for legacy duty.

J. O. Westwood, Esq., F.L.S., exhibited numerous species of *Sphingidæ*, *Nocturnal Lepidoptera*, and other insects, from the collection of Lieut.-Col. Hearsey, formed during a residence of thirty years in Central India. He stated this collection to be very interesting on account of its local character, and as compared with the splendid collections recently received from Sylhet and the Himalayas, exhibited at late meetings of this Society. In Colonel Hearsey's collection the species of the modern genus *Papilio* are very few in number, and well known. Of *P. Hector* there is but a single specimen. There is not a single species of *Lucanus*, nor true *Fulgora*, in the collection; a striking peculiarity as compared with the Sylhet and Himalayan collections. The collection, however, contains a species of *Paussus* and one of *Diopsis*, both new; a very minute *Apotomus*, specimens of both sexes of the interesting Hymenopterous genus *Trirogma*, a number of very English-looking *Harpalidæ*, various *Alhyrei* and *Bolboceri*, as well as most of the new species described by Mr. Saunders in the last Part of the Transactions of the Entomological Society.

Read the concluding portion of "A Catalogue of Spiders, either not previously recorded or little known as indigenous to Great Britain, with remarks on their Habits and Economy." By John Blackwall, Esq., F.L.S., &c.

The following is a list of the species enumerated by Mr. Blackwall:—

1. *Drassus sericeus*, Walck. In several of the northern counties of England and Wales.

2. *Drassus ater*, Walck. Common in Denbighshire and Caernarvonshire.

3. *Clubiona epimelas*, Walck. Found rarely in the wooded districts of Denbighshire.
4. *Clubiona accentuata*, Walck. In the woods of Denbighshire and Caernarvonshire.
5. *Clubiona erratica*, Walck. Frequent in the woods and commons of Denbighshire.
6. *Argyroneta aquatica*, Walck. In the fens of Cambridgeshire, *Mr. Babington*; and in small pools in Cheshire, *Mr. Glover*.
7. *Ciniflo ferox*, Blackw. Abundant in England and Wales.
8. *Ergatis latens*, Blackw. On commons in Denbighshire.
9. *Tegenaria domestica*, Walck. Oxford and Cambridge.
10. *Lycosa andrenivora*, Walck. Commons and old pastures in various parts of England and Wales.
11. *Lycosa agretyca*, Walck. Old pastures in England and Wales.
12. *Lycosa allodroma*, Walck., var. *leucophæa*. *Lycosa leucophæa*, *Blackw.*, in *Lond. and Edinb. Phil. Mag.* x. p. 104.
13. *Lycosa picta*, Hahn. In Cheshire and Denbighshire, frequenting sandy districts on the coast.
14. *Lycosa lugubris*, Walck. Abundant in woods in Denbighshire and Caernarvonshire.
15. *Lycosa pallida*, Walck. Frequent on banks of rivers in Denbighshire and Caernarvonshire.
16. *Lycosa piratica*, Walck. Marshes and margins of pools in England and Wales.
17. *Dolomedes fimbriatus*, Walck. In the fens of Cambridgeshire, *Mr. Babington*.
18. *Salticus cupreus*, Hahn. Mountain-woods of Denbighshire and Caernarvonshire.
19. *Salticus coronatus*, Blackw. *Attus coronatus*, *Walck.* Common in the woods of Denbighshire and Caernarvonshire.
20. *Salticus gracilis*, Hahn. Gwydir woods in Caernarvonshire.
21. *Thomisus brevipes*, Hahn. In fields adjacent to woods, at Oakland, near Llanrwst, Denbighshire.
22. *Thomisus bifasciatus*, Blackw. *Xysticus bifasciatus*, *Koch.* In pastures near Llanrwst.
23. *Thomisus citreus*, Walck. In the western parts of Denbighshire.
24. *Philodromus dispar*, Walck. In the wooded parts of Denbighshire and Caernarvonshire.
25. *Philodromus cespiticolens*, Walck. In woods in Denbighshire.
26. *Philodromus oblongus*, Walck. In the north of Cheshire.
27. *Sparassus smaragdulus*, Walck. England, *Mr. Babington*; in the woods at Tan-y-Bwlch in Merionethshire, *Mr. Glover*.
28. *Theridion denticulatum*, Walck. Common in England and Wales.
29. *Theridion signatum*, Walck. Among heath in Denbighshire: rare.
30. *Neriëne trilineata*, Blackw. *Theridion reticulatum*, *Hahn.* Under stones in the neighbourhood of Manchester.

31. *Neriëne graminicolens*, Blackw. Sp. nov. a *Neriëne trilineatâ* diversa pedibus palisque unicoloribus nec annulatis. Old pastures at Oakland, near Llanrwst, Denbighshire.

32. *Manduculus vernalis*, Blackw. Theridion vernale, *Hahn*. In pastures in various parts of Lancashire and Denbighshire.

33. *Pholcus phalangioides*, Walck. Barmouth, Merionethshire, *Mr. Potter*; Liverpool, *Mr. Glover*; Isle of Wight.

34. *Linyphia pallida*, Blackw. Theridium pallidum, *Koch*. Among grass in the grounds about Oakland.

35. *Epeïra bicornis*, Walck. In the wooded parts of Denbighshire.

36. *Epeïra agelena*, Walck. In pastures near Llanrwst.

37. *Epeïra scalaris*, Walck. In the neighbourhood of London.

38. *Epeïra umbratica*, Walck. Abundant in various parts of England and Wales.

39. *Epeïra fusca*, Walck. In Denbighshire and Caernarvonshire.

40. *Epeïra antriada*, Walck. Common in the north of England and Wales.

41. *Dysdera erythrina*, Walck. In the town of Manchester; also in Cambridge, *Mr. Potter*.

42. *Dysdera rubicunda*, Koch. Cambridge, *Mr. Babington*.

43. *Dysdera Hombergii*, Walck. Plentiful in the wooded districts of Denbighshire and Caernarvonshire.

44. *Oönops pulcher*, Templ. Deletrix exilis, *Blackw.*, in Lond. and Edinb. Phil. Mag. x. p. 100. In Lancashire, Denbighshire and Caernarvonshire: abundant in the two last.

Mr. Blackwall states, that with a few exceptions, the spiders comprised in the foregoing catalogue have never before been recognized as British species. With respect to nearly the whole of them, numerous facts are detailed relative to their structure, instincts, economy and haunts, with occasional remarks on their nomenclature and systematic arrangement.

Read also a "Description of a new Indian species of *Paussus*." By J. O. Westwood, Esq., F.L.S., &c.

This species, which is in the collection made by Lieut.-Colonel Harsey mentioned above, approaches *Platyrhopalus* in having the penultimate joint of its labial palpi about two-thirds the length of the terminal joint. In all its other characters, however, it accords so exactly with the Indian species of Mr. Westwood's second division of the genus *Paussus*, that were the antennæ broken off, it would be almost impossible to distinguish it from *Paussus cognatus*.

Paussus Harseyanus, rufo-castaneus nitidus punctatus, elytris singulis plagâ latâ longitudinali nigrâ, capite pone oculos carinâ elevatâ transversâ alterâque longitudinali medianâ ad nasum ferè ductâ, antennarum

clavâ subovatâ basi extûs in hamum productâ; margine posticè supernèque obliquè 3-impresso.

The only specimen known was captured by Col. Hearsey at Benares by night, having flown against the lamp and fallen upon the table, a habit observed in other species of the genus by several Indian entomologists.

May 5.

The Lord Bishop of Norwich, President, in the Chair.

Capt. Theobald Jones, R.N., M.P., was elected a Fellow.

His Grace the Duke of Northumberland, K.G., F.R.S., F.L.S., &c., sent for exhibition a specimen of the ripe fruit of *Diospyros edulis*, and of the female flowers of the same, grown in one of His Grace's stoves at Sion.

J. A. Hankey, Esq., F.L.S., laid on the table for distribution numerous specimens of *Fritillaria Meleagris*, L., gathered by himself at Finchley, Middlesex.

W. H. Rudston Read, Esq., F.L.S., exhibited a specimen of a shell (*Spondylus varius*, Brod.) collected at Riatea, one of the Society Islands, under the enamel of which was retained for several months a quantity of water.

Read a portion of Dr. Hamilton Buchanan's Commentary on the 8th Part of Rheede's 'Hortus Malabaricus.'

May 24.

The Lord Bishop of Norwich, President, in the Chair.

This day, the Anniversary of the birth of Linnæus, and that appointed by the Charter for the Election of Council and Officers, the President opened the business of the Meeting, and stated the num-

ber of Members whom the Society had lost during the past year, of some of whom the Secretary read the following notices:—

John Ansley, Esq.

Sir Wm. Beatty, Knt., M.D., F.R.S., well known as having been surgeon of the Victory at the memorable action off Cape Trafalgar, and as having in that capacity assisted at the last moments of Lord Nelson, of which he afterwards published an account.

Sir Charles Bell, K.H., F.R.S. Lond. & Ed., Professor of Surgery in the University of Edinburgh.

The very recent death of this eminent surgeon and distinguished physiologist precludes on the present occasion any detailed account of his life and works. He was born in Edinburgh in 1778, and the early part of his life was spent in his native city as the assistant of his brother John in his surgical lectures. He came to London in 1806, and became lecturer on surgery at the Hunterian School in Windmill Street, and afterwards one of the surgeons of the Middlesex Hospital. His important discoveries in the functions of the Nervous System, by which his fame has been most widely spread, were communicated in a series of papers read before the Royal Society, commencing in 1821. On the accession of King William the Fourth he received the honour of knighthood; and in 1836 he returned to Edinburgh, having been appointed to the Professorship of Surgery in that University. He died almost suddenly at the beginning of the present month.

The Rev. Isaac Bell.

John Eddowes Bowman, Esq., was born at Nantwich in Cheshire, on the 30th October, 1785. He was in early life confined to business during more than twelve hours of the day, and yet contrived, by early rising, to cultivate a taste for botany, which he had imbibed from his father. The small town in which he lived furnished no persons of congenial pursuits with whom he could associate, but this circumstance, though it limited his progress, did not damp his ardour. He became the manager of a bank at Welch Pool, and with an income extremely limited, was not only enabled to give a liberal education to his rising family, but, by the help of such books and instruments as he could purchase, to extend his studies to many branches of natural science with great zeal and success. In 1824 he became a partner in a banking establishment in Wrexham, from which he retired in 1830, and never entered into business again; for being in possession of a moderate competence, he willingly relinquished together the profits and the cares of active life, in exchange for the tranquil happiness he hoped to enjoy from the undivided pur-

suit of those sciences of which he had ever been passionately fond. Hitherto he had been able to follow them only as a recreation, having never allowed their cultivation to encroach on the time set apart for business; yet he had already, from the ample stores around him, acquired extensive collections in the departments of botany and geology, which were his favourite studies.

In 1837 he transferred his residence to Manchester, where he intended to pass the remainder of his life. During his short abode in that great emporium of manufactures and commerce he endeavoured by all the means in his power to advance and diffuse a love for science, and especially for natural history; and by his associates in the different societies of that place his memory will be warmly cherished. He had looked forward with much interest to the approaching meeting of the British Association for the Advancement of Science in that town, but this hope was not realized. He died after a sudden illness on the 4th December last.

Mr. Bowman became a Fellow of this Society in 1828. He has contributed two papers to the sixteenth volume of its 'Transactions': viz. "An Account of a new Plant of the Gastromycous order of *Fungi*," which is well described and figured under the name of *Enerthema elegans*; and a memoir "On the parasitical connexion of *Lathræa Squamaria*, and the peculiar structure of its subterranean leaves." The last-named paper is a valuable contribution to our knowledge of a very obscure branch of vegetable physiology, the connection, namely, of Root-Parasites with the plants on which they grow, and is beautifully illustrated by two plates of details, from Mr. Bowman's own pencil. His other natural-history publications are, with one exception, geological. They consist of, 1. a memoir "On the Longevity of the Yew, as ascertained from actual sections of its trunk, and on the origin of its frequent occurrence in Churchyards," in Loudon's 'Magazine of Natural History for 1836'; 2. "Notes on a small patch of Silurian Rocks to the W. of Abergale, on the northern coast of Denbighshire," communicated by Mr. Murchison to the Geological Society in 1838; 3. "On a white fossil Powder found under Peat-Bog in Lincolnshire, composed of the siliceous fragments of microscopic parasitical *Confervæ*;" 4. "On the origin of Coal, and the geological conditions under which it was produced;" 5. "Observations on the characters of the Fossil Trees discovered on the line of the Bolton Railway;" 6. "On the Upper Silurian Rocks in the Vale of Llangollen, North Wales;" (the four latter communicated to the Manchester Geological Society, and published in the first volume of their 'Transactions';) 7. three papers in the 'Philosophical Maga-

zine' for 1840, "On the Natural Terraces on the Eildon Hills;" and 8. a memoir in the same Journal for 1841, "On the question whether there are any evidences of the former existence of Glaciers in North Wales."

The Rev. Thomas Butt.

Edmund John Clark, M.D.

George Coles, Esq.

Richard Goolden, Esq.

William Harrison, Esq., Queen's Counsel, a Bencher of the Inner Temple, Counsel of the Treasury and War Office, and Attorney-General for the Duchy of Cornwall, died at his seat at Cheshunt, Herts, on the 4th of October last. He was eminently distinguished in his profession, in the parliamentary business of which he for many years took the lead. Those among us who have visited his retreat at Cheshunt are not likely soon to forget the beautiful garden, with its noble range of stoves and conservatories, which he had formed there, or the kind hospitality with which they were received. Much of his leisure was devoted to planting, and his garden exhibited, in the great variety of trees and shrubs which it contained and the taste displayed in their arrangement, ample proof of his attachment to that pursuit.

James Rawlins Johnson, M.D., F.R.S., &c., was author of "A Treatise on the Medicinal Leech, including its medical and natural history, with a Description of its Anatomical Structure; also, Remarks upon the Diseases, Preservation and Management of Leeches," 1816, 8vo, London; and of two papers published in the 'Philosophical Transactions' for 1817, entitled "Observations on the mode of Propagation of the *Hirudo vulgaris*, or Rivulet-Leech," and "On the *Hirudo complanata* and *Hirudo stagnalis*, now formed into a distinct genus under the name of *Glossopora*." These two papers were reprinted in 1825, with some additional facts and observations, under the title of "Further Observations on the Medicinal Leech." In these publications Dr. Johnson contributed much to the elucidation of the natural history of the Leech, which has since been so ably completed by Carena and others.

Aylmer Bourke Lambert, Esq., the last survivor of the original members of the Linnean Society, and for nearly fifty years one of its Vice-Presidents, was born at Bath on the 2nd of February, 1761. His father, Edmund Lambert, Esq., of Boyton-House, near Heytesbury, Wilts., married Bridget, daughter of the last Viscount Mayo and his only surviving child, through whom Mr. Lambert inherited the family property and the name of Bourke. He was educated at

St. Mary's Hall, in the University of Oxford, and attaching himself early in life to botanical pursuits, joined the Linnean Society at its foundation, and became one of its warmest friends and promoters. In 1791 he also became a Fellow of the Royal Society.

On succeeding to his paternal estate, he was enabled to indulge his taste for botany more freely, and laboured with great ardour and success to increase his herbarium, which at length acquired the character of being one of the most valuable and important private collections in existence. Of this herbarium, and of the several collections from which it was chiefly formed, an account has been given by Mr. Don, who for many years acted as its curator, and who had also charge of Mr. Lambert's extensive botanical library. These collections were at all times most liberally opened by their possessor for the use of men of science, and one day in the week (Saturday) was constantly set apart for the reception of scientific visitors, travellers and others, who either brought with them or sought for information on botanical subjects.

Mr. Lambert's separate publications are two in number: "A Description of the Genus *Cinchona*," London, 1797, 4to, and "A Description of the Genus *Pinus*," London, 1803-24, in two vols. folio. Of the latter work, which is one of the most splendid botanical publications that ever issued from the press, a second edition, with additions, was published in 1828, and a third volume was added in 1834. A small edition, in two vols. Svo, was also published in 1832.

His other works consist entirely of papers in our 'Transactions.' They are as follows:—

"An Account of the *Canis Graius Hibernicus*, or Irish Wolf-Dog," in vol. ii.

"Anecdotes of the late Dr. Patrick Browne, author of the 'Natural History of Jamaica'," in vol. iv., containing some interesting particulars relative to that intelligent naturalist, from whom Mr. Lambert received and presented to this Society his MS. of a 'Flora Hibernica,' together with a small herbarium, collected in the counties of Mayo and Galway, and a separate collection of Mosses.

"A Description of the Blight of Wheat, *Uredo Frumenti*."

"A Description of *Bos frontalis*, a new species from India," described from a living specimen in the collection of Mr. Brookes of the New Road.

"Observations on the *Zizania aquatica*," accompanied by a figure from the pencil of Ferdinand Bauer, taken from specimens grown by Sir Joseph Banks in a pond at Spring-grove.

"A further Account of *Bos frontalis*," containing numerous par-

ticulars of its habits, taken from a Letter written by Mr. Macrae. These four papers are in vol. vii.

“A Description of a new Species of *Macropus* (*M. elegans*), from New Holland,” from a living specimen in the collection at Exeter Change, in vol. viii.

“Some Account of the Herbarium of Prof. Pallas,” in vol. x., which, besides a general account of the collection, then recently purchased by Mr. Lambert, contains characters of a number of new species of plants, which are figured on six accompanying plates.

“Notes relating to Botany, collected from the MSS. of the late Peter Collinson, Esq.,” also in vol. x., and affording many interesting notices relating to botanists, gardeners and gardens in England, in the middle of the last century.

“Description of a new Species of *Psidium*” (*P. polycarpon*), which had ripened its fruit at Boyton, in vol. xi.

“Some Account of the Galls found on a species of Oak from the shores of the Dead Sea,” and a “Note on the Mustard-plant of the Scriptures,” in vol. xvii.

Mr. Lambert's health had for some years been failing, and he had ceased to visit his country-seat at Boyton, but preferred, when out of town, taking up his residence of Kew, where his proximity to the Royal Gardens, and to his friends in town, afforded him more copious sources of enjoyment than he could have found elsewhere. He died at Kew, on the 10th of January in the present year, and his remains were removed to Boyton for interment. He married Catharine, daughter of Richard Bowater, Esq., of Allesley in the county of Warwick, but was left a widower, without any family, some years before his death.

Charles Lane, Esq.

Richard Leigh, Esq.

Archibald Menzies, Esq., who, on the death of Mr. Lambert, became father of the Society, was born at Weem, in the county of Perth, on the 15th of March, 1754. He was early attached to the Botanic Garden at Edinburgh, of which his brother William afterwards had charge; and was enabled, through the kind assistance of Dr. John Hope, then Botanical Professor in that University, who was attracted by his love for natural history and especially botany, to pass through the academical studies necessary for his education as a surgeon. In the summer of 1778 he made a tour, under the auspices of Dr. Hope, through the Highlands and Hebrides, with the view of collecting their rarer plants, to which attention was then strongly directed by the recent publication of Lightfoot's ‘*Flora Scotica*.’ He

afterwards became assistant to a surgeon at Caernarvon; but soon quitting for a time the practice of his profession on shore, he entered the navy, and became assistant-surgeon on board the *Nonsuch*, Captain Truscott, in which vessel he was present at the famous victory obtained by Rodney over the *Comte de Grasse* on the 12th of April, 1782. After the peace of that year he remained for some time on the Halifax station. In 1786 he embarked as surgeon on board the *Prince of Wales*, a vessel fitted out by the enterprising firm of John and Cadman Etches and Co., and was placed under the command of Lieut. (afterwards Captain) Colnett, of the Royal Navy, for a voyage of commercial discovery to the north-west coast of America. In this voyage he visited Staten Land, where he remained for some time, the Sandwich Islands and China, as well as North-western America, and returned from China by the direct route to England in the beginning of 1789. In the following year he was appointed in the capacity of naturalist, and with the rank of surgeon, to accompany Captain Vancouver, on board the *Discovery*, in his celebrated voyage; from which, after visiting King George's Sound on the south coast of New Holland, a part of New Zealand, Otaheite and the Sandwich Islands, and exploring by far the greater part of the north-west coast of America, he returned to England in the autumn of 1795. During one of the visits made by this expedition to the Sandwich Islands he ascended Wha-ra-rai and Mowna-roa, two of the principal mountains of the island of Owhyhee, and determined their heights (that of the latter exceeding 13,000 feet) by barometrical observations made simultaneously with others on board the vessel. "Some account" of his ascent of the former was subsequently given by him in the 1st and 2nd volumes of Loudon's 'Magazine of Natural History.' From an early period of the voyage Mr. Menzies added to his duties as naturalist those of surgeon of the *Discovery*, and it affords a striking proof of his professional skill, that on so arduous a service and in so protracted a voyage, not a single man was lost by disease after quitting the Cape of Good Hope in their passage out.

From these various voyages Mr. Menzies brought back with him to England large collections of natural history, chiefly botanical. A very considerable number of the plants which he had collected, and especially of the Cryptogamous, to the study of which he was always devotedly attached, were new to science, and have been described from his specimens by Sir James Edward Smith, Mr. Brown, Sir W. J. Hooker and other botanical friends, among whom they were most liberally distributed. His own publications were few in num-

ber. In the 1st volume of our 'Transactions' are contained "Descriptions of three new Animals [*Echeneïs lineata*, *Fasciola clavata*, and *Hirudo branchiata*] found in the Pacific Ocean" during his first voyage round the world; and in the 4th, "A new Arrangement of the Species of *Polytrichum*, with some Emendations," which, together with an Appendix, afterwards added, forms a valuable monograph of that extensive genus. In the 'Philosophical Transactions' for 1796, he gave, in conjunction with Mr. (afterwards Sir Everard) Home, "A Description of the Anatomy of the Sea-Otter," of which he had brought home a fine specimen, afterwards presented, with many other zoological specimens and a set of his plants, to the British Museum.

He subsequently served in the West Indies as surgeon of the *Sanspareil*, commanded by Lord Hugh Seymour; but early in the present century he quitted the sea, and continued to practise his profession in London. For some years previous to his death he had retired to Notting Hill, where he passed the tranquil remainder of his lengthened existence, eager to the last to obtain additions to his botanical collection, and enjoying the society of his numerous friends with a kindness of heart that never failed.

He died on the 15th of February in the present year, having nearly reached the age of 88, and was buried beside his wife (who died five years earlier, and by whom he had no children), in the Cemetery at Kensal Green. He left his herbarium, consisting chiefly of Cryptogamous plants, *Gramineæ* and *Cyperaceæ*, arranged with characteristic neatness on paper of an 8vo size, to the Botanic Garden at Edinburgh, where he had studied; and also gave by his will a bequest of £100 to this Society, of which he became a Fellow on the 19th of January, 1790, and to which he was always most warmly attached.

David Pennant, Esq., son of the distinguished naturalist and elegant writer to whom we owe so many agreeable and instructive publications, and who, on the foundation of this Society, was elected one of its Honorary Members, died on the 24th of June, in the 78th year of his age. He edited some of his father's posthumous works, to one of which, consisting of the third and fourth volumes of the 'Outlines of the Globe,' he supplied a preface containing some account of the latter days of his parent, and an eloquent tribute to his talents and virtues. He was himself one of the oldest Fellows of the Society, having been elected in 1792.

Among our FOREIGN MEMBERS we have sustained, in common with the whole world of science, a severe loss in the person of

Augustin Pyramus DeCandolle, a botanist of such distinguished eminence as to demand from us a more than ordinary tribute of respect. Descended from a family which came originally from Marseilles, but had for more than two centuries been settled at Geneva, and which towards the close of the sixteenth century furnished one of that illustrious band of classical printers who united in so high a degree the study of letters with the art of transmitting them to posterity, he was born in the latter city, of which his father had been Premier Syndic, on the 4th of February, 1778. His youthful inclinations were turned towards literature rather than science; but a residence in the country awakened in him a taste for botany, which his attendance on the lectures of Professor Vaucher confirmed, and at the age of sixteen his path in life was determined, and he devoted himself to the cultivation of botanical science.

In 1795 he paid his first visit to Paris, where he attended the lectures of Cuvier, Lamarck, Fourcroy, Vauquelin, and other distinguished professors; and when Geneva was a few years afterwards incorporated with the French Republic he returned to the metropolis, where he fixed his residence for several years, attending the medical classes and pursuing his botanical studies at the same time under Jussieu and Desfontaines, with both of whom he formed a close and intimate friendship. Soon after taking up his abode in Paris he commenced the publication of his '*Plantarum Historia Succulentarum*,' which was speedily followed by his '*Astragalogia*;' and in 1802 he began to furnish the text to Redouté's magnificent work, '*Les Liliacées*,' which he supplied up to the 4th volume. In 1805 he was associated with Lamarck in the third edition of that excellent naturalist's '*Flore Française*,' to which he prefixed an introduction, entitled '*Principes Élémentaires de Botanique*,' and containing the outlines of a course of lectures which he had delivered in the previous year at the Collège de France. A '*Synopsis Plantarum in Florâ Gallicâ descriptarum*' followed in 1806. He had previously, in 1804, connected his medical and botanical studies in an '*Essai sur les Propriétés Médicales des Plantes, comparées avec leur classification naturelle*,' of which a second edition appeared in 1816. At an early period of his residence in Paris M. DeCandolle took an active part in the formation, under the auspices of Baron Benjamin Delessert, of the *Société Philanthropique* for the supply of oeconomic soups to the poor and other charitable purposes, of which he continued for several years to be the secretary. The Society for the Encouragement of National Industry is also stated to have been formed under his direction and management.

In 1806 he ceased to be permanently resident in Paris. He re-

ceived in that year a commission from the Imperial Government to collect information on the state of botany and agriculture throughout the empire, and in pursuance of this commission he took for six successive years annual journeys into the several departments, the results of which are contained in his 'Rapports sur les Voyages Botaniques et Agronomiques faits dans les Départemens de l'Empire Français,' which were published in a collected form in 1813.

Soon after his appointment to this important task he quitted Paris for Montpellier, where he became Professor of Botany in the Faculty of Medicine in 1807, and a Chair of Botany having been established in the Faculty of Sciences of that Academy in 1810, he attached himself with renewed ardour to the promotion of his favourite pursuit. Under his direction the Botanic Garden was greatly improved, and a Catalogue, with descriptions of many new species, was published by him in 1813, in which year his 'Théorie Élémentaire de la Botanique' also made its first appearance. Many valuable memoirs, scattered through various publications, but chiefly taken from the 'Annales du Muséum d'Histoire Naturelle,' were in this year collected into a volume.

After the second Restoration of the Bourbons, circumstances occurred which induced him to quit Montpellier and return to his native city, now restored to independence. A Chair of Natural History was instituted expressly for him, of which he took possession in January 1816, and the Botanic Garden, established towards the close of the last century with the assistance of funds bequeathed for that purpose by the celebrated Bonnet, was greatly augmented, partly by assistance derived from the Government, and partly by voluntary subscription. Several Fasciculi of the 'Plantes rares du Jardin de Genève' attest the interest which he took in its success.

In 1816 he visited England for the purpose of consulting the Herbaria of our country with a view to the general system of plants, the publication of which he then meditated, and during his stay here communicated to the Linnean Society a paper entitled "Remarks on two Genera of Plants to be referred to the Family of *Rosaceæ*." These are *Kerria* and *Purshia*, previously strangely misunderstood, and as strangely misplaced in distant and very dissimilar families. His memoir on this subject, the only one by M. DeCandolle which has a place in our 'Transactions,' is contained in the twelfth volume.

In 1818 appeared the first volume of his intended 'Regni Vegetabilis Systema Naturale,' which was followed by a second in 1821. But the plan of this work was obviously too vast for accomplishment by individual industry, however great; and after the publication of these two volumes, M. DeCandolle recognized the necessity of con-

fining himself within narrower limits. In the year 1824 he commenced the publication of his 'Prodrromus Systematis Regni Vegetabilis,' the title of which indicates his intention at some future period to resume the more extensive work. But even this 'Enumeratio Contracta,' as he designates it, proved too mighty a labour, and in the remaining seventeen years of his life, all that his unwearied energy could accomplish was the publication of seven volumes, completing probably about two-thirds of the contemplated task. The value of these important manuals, in the present state of botanical science, can only be estimated by those with whom they are of necessity in daily use. On many of the more interesting families on which they treat he simultaneously published a series of descriptive memoirs.

It is the great merit of this important work, that, far more than any other approaching it in extent, it is founded on actual observation. M. DeCandolle's own herbarium was extremely rich; he had visited and carefully examined many of the most extensive collections, and especially those of Paris; and many entire collections as well as separate families, on which he was specially engaged, were from time to time submitted to his examination by their possessors. He had thus opportunities of comparison greatly beyond what in ordinary circumstances fall to the lot of an individual. His library too was stored with almost every important publication that could be required for his undertaking. With such ample materials, aided by his untiring zeal and the persevering energy of his character, he steadily pursued his allotted task, and only ceased to labour at it when he ceased to live.

It was not merely as a botanist that M. DeCandolle deserved well of his country and of mankind. Both as an individual and in the Council of his native city, he was ever active in the promotion of measures of public utility, whether they related to the improvement of agriculture, the cultivation of the arts, the advancement of public instruction, or the amelioration of the legislative code. Even in his botanical lectures he never lost an opportunity of inculcating the importance of these and similar subjects. Those lectures were attended by a numerous class, who caught from their teacher a portion of the enthusiasm with which he was himself inspired. Some idea of the manner in which he brought their subject before his auditors may be obtained from his 'Organographie' and 'Physiologie Végétale,' published in 1827 and 1832, which contain the substance of his lectures on those two great departments of the science.

For some years his health had been declining, and it is to be feared that the severe and incessant attention which he paid to the elaboration of the great family of *Compositæ* had made a deep inroad

upon it. As a relaxation from his labours, he undertook, in the last year of his life, a long journey, and attended the Scientific Meeting held at Turin; but he did not derive from this journey the anticipated improvement in his health, which gradually failed until his death, on the 9th of September last. He has left a son, Alphonse, well known as the author of several valuable botanical publications, one of which, his memoir on the family of *Myrsineæ*, appeared in our 'Transactions.'

Jens Wilken Hornemann was born in 1770, and studied at the University of Copenhagen, where his 'Försög til en Dansk œconomisk Plantelære' obtained a prize in 1795. In 1798 he commenced a botanical tour through Germany, France and England, and in 1801 became lecturer at the Copenhagen Botanic Garden. He succeeded his teacher Vahl as Regius Professor and Director of the Garden in 1804, and published in 1807 an 'Enumeratio Plantarum Horti Havniensis,' and in 1813 and 1815 a more complete synopsis of the plants there cultivated under the title of 'Hortus Regius Botanicus Havniensis.' In 1819 he wrote a dissertation 'De Indole Plantarum Guineensium.' After the death of Vahl he superintended the publication of the 'Flora Danica,' and several papers by him have been published in the 'Transactions of the Danish Philosophical Society' and the 'Tidskrift for Naturvidenskaberne,' of which he was one of the editors. His lectures and writings have done much to extend the study of botany in Denmark, and have contributed to maintain the character acquired for Danish botanists by Kœnig, Forskåhl, Œder, Rottböll and Vahl.

Among the ASSOCIATES we lament the loss of

The Rev. Robert Francis Bree, who became a Fellow of the Linnean Society in 1815, and was placed on the List of Associates in 1827. He died at his residence in the New Kent Road on the 28th of January in the present year, at the age of 66.

David Don, Esq., Professor of Botany in King's College, London, and Librarian of this Society, was born in the year 1800, at Forfar, where his father, an acute practical botanist, had established a Nursery and Botanic Garden. On his father's being afterwards appointed to the charge of the Botanic Garden at Edinburgh, he attracted the notice of Mr. Patrick Neill, and was enabled to attend some of the classes in that city. His father, however, after a while quitting Edinburgh, he returned with him to Forfar, and received his early training in the Garden there. Subsequently he again visited Edinburgh, and had charge of the stoves and greenhouses in the esta-

blishment of the Messrs. Dickson of Broughton near that city, then among the finest in Scotland. Late in 1819 he removed to London, and soon after became librarian to Mr. Lambert, in whose house he was domiciled, and of whose extensive herbarium he had charge. About this period he published "Descriptions of several new or rare native Plants, found in Scotland chiefly by the late Mr. George Don, of Forfar;" and wrote "A Monograph of the Genus *Saxifraga*," which appeared in the 13th volume of our 'Transactions.' These publications brought him into favourable notice, and in the year 1822 he became Librarian of the Linnean Society, an office which he continued to hold till his death, and in which he acquired the universal respect and esteem of the Members by the wide extent of his information and the liberality with which he was at all times ready to impart it.

On the death of Prof. Burnet in 1836 he succeeded to the Botanical Chair at King's College, which he also retained till his decease. His constitution was apparently robust, but towards the end of 1840 a tumour appeared in his lower lip, which it was found necessary to remove. The disease, however, after a short respite, reappeared in the neck, and assuming by degrees a decidedly malignant character, left no hope of his long surviving. He died on the 8th of December last, worn out by severe suffering, which he bore with the most exemplary fortitude, and was buried on the 15th of the same month in the Cemetery at Kensal Green. He was married, but left no children.

As a systematic botanist his character stands deservedly high. His knowledge of plants was most extensive, and his appreciation of species ready and exact. The most important of his publications are his "Prodromus Floræ Nepalensis;" his monographs of *Saxifraga* and other genera, and of the family of *Melastomaceæ*; his memoirs on *Compositæ*, in our 'Transactions;' and his papers, especially those on the plants of Peru and Chile, in the 'Edinburgh Philosophical Journal.' The following is believed to be a nearly complete catalogue of his works:—

I. In the 'Transactions of the Linnean Society:'

1. "A Monograph of the Genus *Saxifraga*," in vol. xiii.

2. "Descriptions of nine new species of *Carex*, natives of the Himalaya Alps in Upper Nepal," in vol. xiv.

3. "Description of *Cowanina*, a new genus of Plants; and of a new species of *Sieversia*," in vol. xiv.

4. "Description of a new genus (*Lophospermum*) belonging to the Natural Family of Plants called *Scrophularineæ*," in vol. xv.

5. "On the Origin and Nature of the ligulate Rays in *Zinnia*, and on a remarkable multiplication observed in the parts of fructification of that genus," in vol. xvi.
6. "Descriptions of the new genera and species of the Class *Compositæ*, belonging to the Floras of Peru, Mexico and Chile," in vol. xvi.
7. "On the Plant which yields the Gum Ammoniacum," in vol. xvi.
8. "Observations on the *Tropæolum pentaphyllum*, Lam.," and "Additional Observations" on the same, in vol. xvii.
9. "On the modifications of Æstivation observable in certain plants formerly referred to the Genus *Cinchona*," in vol. xvii.
10. "Remarks on some British Ferns," in vol. xvii.
11. "Descriptions of five new species of the Genus *Pinus*, discovered by Dr. Coulter in California," in vol. xvii.
12. "Descriptions of Indian *Gentianeæ*," in vol. xvii.
13. "Descriptions of two new genera of the Natural Family of Plants called *Coniferæ*," in vol. xviii.
14. "Description of a new genus of Plants (*Catophractes*) belonging to the Natural Family *Bignoniaceæ*," in vol. xviii.
15. "Descriptions of the Indian species of *Iris*," in vol. xviii.
16. "An Account of the Indian species of *Juncus* and *Luzula*," in vol. xviii.
17. "A Monograph of the Genus *Disporum*," in vol. xviii.
18. "A Monograph of *Streptopus*, with the Description of a new genus (*Prosartes*) now first separated from it," in vol. xviii.
- II. In the 'Memoirs of the Wernerian Society of Edinburgh:'
19. "Descriptions of new or rare Native Plants, found in Scotland by the late Mr. George Don of Forfar," in vol. iii.
20. "Descriptions of new Plants from Nepal, in the Herbarium of A. B. Lambert, Esq.," in vol. iii.
21. "Illustrations of the Natural Family of Plants called *Melastomaceæ*," in vol. iv.
22. "A Monograph of the Genus *Pyrola*," in vol. v.
23. "On the classification and division of *Gnaphalium* and *Xeranthemum* of Linnæus," in vol. v.
- III. In the 'Edinburgh New Philosophical Journal:'
24. "Observations on *Philadelphæa* and *Granatæa*, two new Families of Plants," in vol. i.
25. "On the Affinities of *Empetrea*," in vol. ii.
26. "On the Rhubarb of Commerce, the Purple-coned Fir of Nepal, and the Mustard-tree," in vol. ii.
27. "Description of the Genus *Malesherbia* of the Flora Peruviana, with remarks on its affinities," in vol. ii.

28. "Observations on the Cow-tree of the Caraccas, and on the culture of the Nutmeg," in vol. iii.

29. "Remarks on the Irritability of the Stigma, and on the Origin and Nature of certain parts of the Fructification in *Pinus Larix*," in vol. iv.

30. "On the general presence of spiral Vessels in the Vegetable Structure," in vol. vi.

31. "Descriptions of the Genera *Columellia*, *Tovaria* and *Francoa*," in vol. vi.

32. "An attempt at a new Classification of the *Cichoraceæ*," in vol. vi.

33. "On the Characters and Affinities of *Darwinia*, *Brunsfelsia*, *Browallia*, *Argylia*, *Eccremocarpus*, and of a Plant improperly referred to the latter genus," in vol. vii.

34. "On the Affinities of *Vellozia*, *Barbacenia*, *Glaur*, *Aucuba*, *Viviania*, *Deutzia*, and of a new genus of the Order *Rubiaceæ*," in vol. viii.

35. "On the anomalous Structure of the Leaf of *Rosa berberifolia*," in vol. viii.

36. "A Monograph of the Family of Plants called *Cunoniaceæ*," in vol. ix.

37. "On the Characters and Affinities of certain Genera, chiefly belonging to the Flora Peruviana," various papers in vols. x.—xiv.

38. "Descriptions of some new species of *Malesherbia*, *Kage-neckia*, *Quillaja*, and of a new genus of *Salicariæ*," in vol. xii.

39. "Additional Remarks on *Ercilla*, *Macromeria*, *Aitonia* and *Citronella*," in vol. xiv.

40. "On the *Coniferæ* at present growing in Australia," in vol. xiv.

41. "On the Characters and Affinities of the Genus *Codon*," in vol. xv.

42. "On the Connexion between the Calyx and Ovarium in certain Plants of the Order *Melastomaceæ*," in vol. xv.

43. "Some Remarks on the Plant which yields the Cascarilla Bark," in vol. xvi.

44. "An attempt at a new Arrangement of the *Ericaceæ*," in vol. xvii.

45. "On the Characters of certain Groups of the Class *Personatæ*," in vol. xix.

IV. Miscellaneous :

46. "Prodromus Floræ Nepalensis," 12mo, 1825.

47. The Text of the new Series of Sweet's "British Flower-Garden."

48. "A List of the Plants collected by Mr. Fellows in Asia Minor, with descriptions of some new species," appended to Mr. Fellows's Narrative of his Travels.

Mr. Charles Edward Sowerby (son of the late James Sowerby, and brother of James De Carle and George Brettingham Sowerby, who still survive to maintain the reputation of the family name,) was principally known as a naturalist by the smaller and cheaper edition of the 'English Botany,' which he superintended and which is now nearly completed. He died on the 7th of the present month.

The President also announced that ten Fellows and three Associates had been elected since the last Anniversary.

At the Election which subsequently took place, the Lord Bishop of Norwich was elected President; Edward Forster, Esq., Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out, viz. The Right Hon. the Earl of Beverley; John Alexander Hankey, Esq.; John Miers, Esq.; Roderick Impey Murchison, Esq.; and Alfred White, Esq.

The President announced that Vol. XIX. Part 1. of the Society's 'Transactions' was ready for distribution.

In accordance with the Resolution of Council of the 26th ultimo, the Secretary read the following Statement:—

"The Council having had under their serious consideration the financial affairs of the Society, submit the following Statement to the Fellows at large.

"The cost of the Collections and Library of Linnæus, together with those of the first President Sir James Edward Smith, purchased of the Executors of the latter in 1828, amounted to £3000. Of this sum about £1500 were then raised by subscription; and to meet the remainder a debt on bonds was incurred, which now amounts to £1300, paying interest at 5 per cent.

"In consequence partly of this amount of interest, and partly of a diminution in the Annual Receipts, there has been accumulated within the last few years a further debt of about £500.

"By recent arrangements a saving of some amount has been effected in the Expenditure; but the Council are convinced that no further material reduction can be made without greatly impairing the efficiency of the Society, and they desire to avoid, as far as possible, the necessity of calling upon the Fellows to agree to a small charge being

placed upon the Society's Publications, that appearing to be the most obvious means of supplying the deficiency in the Annual Receipts.

“With this view they propose a General Subscription, which, they trust, may reach such an amount as to meet the present liabilities, and to relieve the funds of the Society from the burthen of debt and interest.

“They therefore earnestly recommend the Subscription to the Members of the Society.”*

* The following is a List of the Subscriptions up to the 20th of October:—

| | £ | s. | | £ | s. |
|--------------------------------|----|----|-------------------------------|----|----|
| The Lord Bishop of Norwich, | | | Rev. Henry Hasted..... | 3 | 3 |
| PRESIDENT | 50 | 0 | Charles Hatchett, Esq. | 5 | 0 |
| His Grace the Duke of Som- | | | John Hogg, Esq..... | 3 | 3 |
| erset | 26 | 5 | Sir Wm. Jackson Hooker, V.P. | 21 | 0 |
| His Grace the Duke of North- | | | Rev. Frederick William Hope | 21 | 0 |
| umberland | 50 | 0 | Thomas Horsfield, M.D., V.P. | 8 | 8 |
| The Rt. Hon. Earl Brownlow | 21 | 0 | Frederick H. Janson, Esq. ... | 5 | 5 |
| William Anderson, Esq..... | 10 | 0 | Joseph Janson, Esq. | 50 | 0 |
| Chas. Cardale Babington, Esq. | 5 | 0 | Mr. Richard Kippist | 5 | 5 |
| Rev. John Barlow | 5 | 0 | Rev. William Kirby..... | 5 | 5 |
| Thomas Bell, Esq. | 21 | 0 | John Leonard Knapp, Esq. .. | 5 | 0 |
| John J. Bennett, Esq., SEC. | 21 | 0 | Henry Lee, Esq., M.D. | 2 | 2 |
| Rev. Miles Joseph Berkeley. | 5 | 0 | William Horton Lloyd, Esq. | 50 | 0 |
| John Blackwall, Esq. | 10 | 0 | Sir John Wm. Lubbock, Bart. | 5 | 5 |
| Francis Boott, Esq., M.D. ... | 10 | 0 | Duncan M'Arthur, Esq., M.D. | 1 | 1 |
| William Borrer, Esq. | 21 | 0 | Gideon Mantell, Esq., LL.D. | 5 | 0 |
| William Borrer, Jun., Esq. ... | 5 | 5 | John Miers, Esq. | 5 | 5 |
| William Arnold Bromfield, | | | Joshua Milne, Esq..... | 50 | 0 |
| Esq., M.D. | 5 | 5 | George Moore, Esq. | 5 | 0 |
| Henry Alexander Brown, Esq. | 5 | 0 | Rev. Thomas Newton..... | 5 | 5 |
| Robert Brown, Esq., V.P. ... | 21 | 0 | William Ogilby, Esq. | 5 | 0 |
| Walter Buchanan, Esq. | 5 | 5 | John Parkinson, Esq..... | 5 | 5 |
| William John Burchell, Esq., | | | Frederick J. Parry, Esq. ... | 5 | 0 |
| LL.D. | 5 | 0 | Algernon Peckover, Esq. | 5 | 5 |
| Jonathan Couch, Esq. | 1 | 0 | Louis Hayes Petit, Esq..... | 10 | 10 |
| Hugh Cuming, Esq. | 5 | 0 | William Pilkington, Esq. ... | 10 | 0 |
| Rev. William Cuthbert, D.D. | 5 | 0 | William Wilson Saunders, Esq. | 5 | 5 |
| Charles Daubeney, Esq., M.D. | 5 | 0 | Daniel Sharpe, Esq. | 5 | 5 |
| David Elisha Davy, Esq. ... | 5 | 0 | Richard Horsman Solly, Esq. | 21 | 0 |
| Lewis Weston Dillwyn, Esq. | 10 | 0 | Sir George Thomas Staunton, | | |
| John Shute Duncan, Esq., | | | Bart..... | 10 | 0 |
| D.C.L. | 5 | 0 | Charles Stokes, Esq. | 10 | 0 |
| Alexander Erskine, Esq. ... | 10 | 10 | Richard Taylor, Esq. | 21 | 0 |
| Edward Forster, Esq., TREA- | | | James Thomson, Esq..... | 5 | 5 |
| SURER and V.P. | 21 | 0 | Nathaniel Bagshaw Ward, Esq. | 10 | 0 |
| Edward Forster, Jun., Esq. ... | 5 | 5 | John Obadiah Westwood, Esq. | 7 | 7 |
| Thomas Forster, M.D. | 5 | 5 | Alfred White, Esq. | 10 | 0 |
| George Townshend Fox, Esq. | 5 | 5 | Jas. Edw. Winterbottom, Esq. | 10 | 0 |
| John Guillemard, Esq. | 5 | 0 | Joseph Woods, Esq. | 21 | 0 |
| Rev. John Hailstone | 5 | 0 | William Yarrell, Esq. | 26 | 5 |
| John Alexander Hankey, Esq. | 26 | 5 | | | |

June 7.

The Lord Bishop of Norwich, President, in the Chair.

An Address to Her Majesty, on the late treasonable attempt on Her Majesty's life, was read and agreed to.

Joseph Hooker, Esq., M.D., was elected a Fellow.

The Hon. H. Wright, of the Ceylon Civil Service, presented specimens of the inner bark of the Cinnamon Tree (the fine Ceylon Cinnamon of commerce), peeled of an unusual length (nearly eleven feet).

Read "An Account of a Fish, nearly allied to the genus *Hemiramphus*, taken in Cornwall." By Jonathan Couch, Esq., F.L.S., &c.

Mr. Couch states, that in the month of August 1841, several individuals of this little fish were found swimming at the surface of a large pool in the rocks near Polperro, where they had been left by the receding tide, having been swept thither by a continued south-west wind, which had also driven in many individuals of *Motella glauca* and other fishes that do not ordinarily select such a situation. Their length was half an inch; the head proportionately large, especially across; the body slender; eye large; snout in front of it short and abrupt; upper jaw arched; under stout, projecting to a considerable extent, but in some specimens more than in others, the point declining, and the sides not appearing to be formed of parallel rami of the jaw, but rather of a cartilaginous substance; vent placed posteriorly; body, which is equal from the head to this point, tapering thence to the tail; lateral line, so far as could be distinguished, straight; dorsal and anal fins single, posterior, opposite, the latter beginning close behind the vent, and both reaching nearly to the tail, their membrane at first broader, but narrowing in its progress; pectoral fins and tail round. The colours of different specimens varied greatly, some being dark with a tint of green, others cream-coloured but sprinkled with specks; regular and thickly set narrow stripes passed from the back obliquely forward, breaking into dots at the sides, in the darker coloured specimens; belly dark.

Mr. Couch was unable to discover ventral fins even with the aid of a lens. He has no doubt of the specimens being in a very early stage of their existence, but cannot refer them to any known species.

He thinks it indeed doubtful whether they really belong to the genus by the name of which he has provisionally designated them, or even to the same family, some parts of their structure seeming to indicate an affinity with the genus *Ammodytes*.

The paper was accompanied by magnified figures.

Read also the commencement of a paper "On the Sea Coconut of the Seychelles, *Lodoicea Seychellarum*, Comm. and Labill." By — Clark, Esq., a gentleman long resident in those islands.

June 21.

Edward Forster, Esq., V.P., in the Chair.

John Bright, Esq., was elected a Fellow.

Read "Observations on the Growth and Reproduction of *Enteromorpha intestinalis*." By Arthur Hill Hassall, Esq.

Mr. Hassall states that, in the earliest stage of their development, the tapering filaments consist of a single series of cells placed end to end. Each of these cells afterwards becomes bisected by a longitudinal line, and other lines subsequently appear, so that the original cells are ultimately divided into several, each of which in its turn enlarges and is in like manner divided. From the continued growth and unlimited division of the cells, the filaments increase to an indefinite size, soon lose their original confervoid character, present a reticulated appearance, and instead of being attenuated become cylindrical and hollow.

Mr. Hassall proceeds to state, that in each articulation of the filaments, and often when they are not thicker than a horse-hair, a dark central nucleus is gradually developed, which is the reproductive germ. He thinks there can be little doubt that this, as well as the cell in which it is contained, undergoes repeated division in the same manner as the reproductive globules of the *Ulvæ*. These reproductive bodies germinate while still inclosed within the cells in which they were developed, and while the parent filament retains all its freshness and vigour, giving rise to the jointed and tapering filaments first described; which in this state, after the rupture of the parent cell, and while their bases are still fixed within it, bear a strong re-

semblance to a parasitic *Conferva*. This development, division and growth of cells and reproductive bodies appears, Mr. Hassall adds, to be going on continually and successively, so that most specimens of the plant present examples of each different stage of its formation.

These observations lead Mr. Hassall to regard *Enteromorpha intestinalis* as having a twofold relation, viz. to the *Confervæ* in its young articulated filaments, and to the *Ulva* in its reproduction from globules which undergo repeated division. He objects to the tautology of the specific name, and proposes that of *lacustris* in its place.

Read also the conclusion of Mr. Clark's paper "On the Sea Coconut of the Seychelles, *Lodoicea Sechellarum*, Comm. and Labill."

Mr. Clark's paper contains a complete history of this remarkable palm, on which so much has been written; but in the following abstract only those points are noticed which appear either to have been overlooked, or not to have been sufficiently attended to by former observers.

Mr. Clark states the *Lodoicea* to have been completely extirpated on Round Island, and to exist at present in a state of nature only on the Islands Praslin and Curieuse. The few which are found on the other islands of the Seychelles Archipelago have all been planted, and only two or three of these appear to thrive. The trunk yields to the slightest breeze, and when the wind is moderately strong, the huge leaves are crashed together with an astonishing noise. The part of the trunk immediately above the surface of the ground forms an inverted cone, which is terminated below by an hemispherical base, from whence spread in all directions a great number of cord-like roots, penetrating to a considerable distance around, and having a tough brown bark surrounding a soft internal substance. These roots remain long after the destruction of the plant to which they belonged. In spots that have been burned, or in some of the oldest clearings, where the trees have long since perished and disappeared, a black circle on a level with the surface of the earth indicates their former existence. This is the base of the cone before mentioned, and now forms the brim of a huge bowl, often filled with decayed vegetable matter; on removing which, the internal surface is found to be pierced by a vast number of holes, forming the openings of the tubes into which the roots have been converted by the decay of their internal substance. Such tubes are generally large enough to admit the end of the fore finger, and are compact and sonorous, but brittle.

So firmly are the leaves attached to the trunk, that Mr. Clark
No. XVI.—PROCEEDINGS OF THE LINNEAN SOCIETY.

states a man may seat himself at the end of one of them with perfect safety. The texture of the leaflets (the largest number of which yet found was ninety-seven) is very strong, and consists of fine threads or fibres disposed in three layers. The direction of the two outer layers is longitudinal, that of the central layer transverse; when denuded by the decomposition of the parenchyma, their tissue resembles coarse book-muslin. Mr. Clark estimates, that three of the leaves, only one of which is produced each year, occupy eight inches on the stem, and that consequently a tree of eighty feet in height must be about 400 [360] years old.

According to Mr. Clark, both the male and female spadix, instead of rising from the angle of the accompanying leaf-stalk, pass through a fissure in its base.

The drupe attains the length of fifteen inches, is about three feet in circumference, and weighs from thirty to fifty pounds. When the fruit has reached its full size, but is still soft (in which state it is called *Coco tendre*), it may easily be cut through with a knife. A transverse section, Mr. Clark states, successively displays the husk, green on the outside but whitish within, of a harsh astringent taste, much like the husk of the common cocoa-nut, inside of which is the substance which is destined to form the shell; next follows a layer, more or less thick, of a mealy insipid substance, of a white colour, covering a yellow substance, of a very decided bitter and said to be poisonous, which incloses the perisperm. This is a white translucent mass of a gelatinous consistence and sweetish taste; taken at the proper period it furnishes an agreeable food, much esteemed by the Séchellois. In the centre of this, at the spot where the two lobes of the perisperm unite, is the germ, at this period scarcely visible.

The germination of the seed sometimes commences before the fall of the fruit, but most frequently after. It is prevented by burying the nut, but readily takes place on the surface of the earth, in a situation not too much exposed to the sun. The length of time from the germination to the period when the trunk begins to be formed above ground, is stated at from fifteen to twenty years; and even in favourable situations the *Lodoicea* is full twenty-five years before producing flowers.

Mr. Clark states, that although the tree puts forth only one spadix in a year, ten or more may be seen flowering at the same time; this is explained by the multiplicity of flowers in each catkin, which blossom successively. The female trees bear flowers and fruit in all their different stages at the same time. As many as seven well-formed

drupes are sometimes produced on a single spadix. It sometimes happens that the fecundation is imperfect, in which case the ovary expands and lengthens, but does not assume the usual form, and at the end of two or three years it drops off; but seven or eight years are required for the full maturing of the nut. This fact Mr. Clark states to have been ascertained on one of the female *Lodoiceas* planted at Mahé, which had flowered for several years without producing fruit, owing to the absence of a male plant. A male flower was procured from an estate a few miles distant and suspended in the tree, and about two months afterwards one of the buds expanded and finally arrived at maturity. The experiment was made in 1833, and the fruit fell at the latter end of 1841.

November 1.

R. Brown, Esq., V.P., in the Chair.

Mr. Joseph Henderson and Mr. Thomas Shearman Ralph were elected Associates.

J. E. Bicheno, Esq., F.L.S., late Secretary of the Society, presented his portrait by Mr. Eddis, and the best thanks of the Society were ordered to be returned to Mr. Bicheno for his very acceptable present.

Jonathan Pereira, M.D., F.L.S., presented specimens of the different varieties of Ceylon, Malabar and Java Cardamoms, &c.

Prof. Owen, F.L.S., exhibited a specimen of the animal of the Pearly Nautilus, with its shell, brought from Amboyna by Captain Belcher, R.N., C.B.

Read "A Notice of the African Grain called Fundi or Fundungi." By Robert Clarke, Esq., Senior Assistant Surgeon to the Colony of Sierra Leone. Communicated by Jacob Bell, Esq., F.L.S.

This Lilliputian grain, which is described by Mr. Clarke as being about the size of mignonette-seed, is stated to be cultivated in the

village of Kissy and in the neighbourhood of Waterloo by industrious individuals of the Soosoo, Foulah, Bassa and Joloff nations, by whom it is called "hungry rice." The ground is cleared for its reception by burning down the copse-wood and hoeing between the roots and stumps. It is sown in the months of May and June, the ground being slightly opened and again lightly drawn together over the seed with a hoe. In August, when it shoots up, it is carefully weeded. It ripens in September, growing to the height of about eighteen inches, and its stems, which are very slender, are then bent to the earth by the mere weight of the grain. They are reaped with hooked knives. The patch of land is then either suffered to lie fallow, or planted with yams or cassada in rotation. Manure is said to be unnecessary or even injurious, the plant delighting in light soils and being raised even in rocky situations, which are most frequent in and about Kissy. When cut down it is tied up in small sheaves and placed in a dry situation within the hut, for if allowed to remain on the ground or to become wet the grains become agglutinated to their coverings. The grain is trodden out with the feet, and is then parched or dried in the sun to allow of the more easy removal of the chaff in the process of pounding, which is performed in wooden mortars. It is afterwards winnowed with a kind of cane fanner on mats.

In preparing this delicious grain for food, Mr. Clarke states that it is first thrown into boiling water, in which it is assiduously stirred for a few minutes. The water is then poured off and the natives add to it palm oil, butter or milk; but the Europeans and negroes connected with the colony stew it with fowl, fish or mutton, adding a small piece of salt pork for the sake of flavour, and the dish thus prepared is stated to resemble kous-kous. The grain is also made into a pudding with the usual condiments, and eaten either hot or cold with milk; the Scotch residents sometimes dressing it as milk-porridge. Mr. Clarke is of opinion that if the fundi grain were raised for exportation to Europe, it might prove a valuable addition to the list of light farinaceous articles of food in use among the delicate or convalescent.

Specimens of the grass accompanied Mr. Clarke's communication, and were examined by Mr. Kippist, Libr. L.S., who added some observations on its botanical characters.

It is a slender grass with digitate spikes, which has much of the habit of *Digitaria*, but which, on account of the absence of the small outer glume existing in that genus, must be referred to *Paspalum*.

Mr. Kippist regards it as an undescribed species, although specimens collected at Sierra Leone by Afzelius are in the collections of Sir James E. Smith and Sir Joseph Banks, on the former of which Afzelius has noted that it is much cultivated by the negroes in Sierra Leone.

Mr. Kippist distinguishes the species by the following characters:—

Paspalum exile, glaberrimum, caule filiformi, racemis subternis digitatis, axi partiali spiculis singulis angustiore, spiculis parvis sub-biseriatis pedicellatis, glumis ovatis acutiusculis paleis æqualibus, foliis linearilanceolatis margine serrulatis.

Gramen sub-bipedale, infernè ramosum; racemi tenues, 3—4-pollicares, subsessiles; axes partiales angustissimæ, planæ, margine minutè denticulatæ; spiculæ vix lineales; glumæ exterioris respectu racheos, (valvulæ floris masculi superstitis) nervi 7—9 æquidistantes, interioris 5, quorum laterales approximati; paleæ minutissimè striatæ; folia plana; vaginæ longissimæ; ligulæ truncatæ integræ.

Read also a letter from N. B. Ward, Esq., F.L.S., containing a statement furnished to him by Mrs. Williams, the widow of the late missionary of that name, respecting the transportation of the *Musa Cavendishii* to the Navigators' Islands, and its culture there. Mr. Williams left England on the 11th of April 1839, and arrived at Upolu, one of the Navigators' Islands, at the end of November. He carried with him, in one of Mr. Ward's glazed cases, a young plant of *Musa Cavendishii*, which bore the voyage well. It was transplanted into a favourable situation, and in May 1840 a cluster of fine fruit (in number exceeding 300) was produced; after which the parent plant died, leaving behind more than thirty suckers, which were distributed to various parts of the island. In May 1841, when Mrs. Williams left to return to England, the greater part of these were in a fructifying state, so that there cannot be a doubt of this valuable plant quickly becoming abundant, not only in Upolu, but also in the neighbouring islands. Mrs. Williams further states that the fruit is highly prized by the natives as being much finer and very different in flavour from any of the species or varieties previously growing in these islands.

Read also a continuation of Mr. Hope's memoir on new and undescribed Insects from Sylhet.

November 15.

E. Forster, Esq., V.P., in the Chair.

Frederick John Parry, Esq., was elected a Fellow ; and Mr. Samuel P. Woodward and Mr. John William Salter, Associates.

Mr. T. S. Ralph, A.L.S., presented numerous fruits and seeds collected in the neighbourhood of Aurungabad.

Read a Note " On the permanent varieties of *Papaver orientale*, L." By T. Forster, M.B., F.L.S., &c.

Dr. Forster states, that ever since the introduction of *Papaver bracteatum*, Lindl., into England, he has regarded it as a permanent variety of *P. orientale*, of which *P. bracteatum*, as having fertile seeds, while those of *P. orientale* are usually sterile, was to be considered the original plant. He retains, however, the name of *orientale* for the species, both as being the earlier and as being applicable to all the varieties, four of which he now distinguishes as permanent by the following characters :—

1. *P. orientale bracteatum*, characterized by its height, its bractæ, its large and deep red petals, and its uniformly perfect seeds.

2. *P. orientale præcox*, the common " Monkey Poppy " of the old gardeners, and the most common variety in England, distinguished by its somewhat depressed capsule and sterile seeds. It flowers along with the former, generally about the 10th of May, the flowers being of a fine deep orange inclining to cinnabar.

3. *P. orientale serotinum*, resembling the last except in that its petals incline more to what is called salmon-colour, but principally characterized by its flowering nearly a month later, along with *P. somniferum*, L., early in June. Dr. Forster has several times tried in vain to make it flower with the commoner sort. The seeds are always imperfect, and the flower and capsule of the same shape as in the last.

4. *P. orientale, capsulâ et floribus longioribus*, which are its principal distinguishing characters. It flowers in May a few days after the old English sort, but is only met with on the Continent : the petals are of the same colour, but the leaves are rather smaller. Dr. Forster states it to be common in the gardens of Belgium as the only variety cultivated, the two last-named varieties being there

unknown. It holds a middle rank between them and *P. orientale bracteatum*, being tall and bearing seeds, which are sometimes prolific, and well deserves to be introduced into English gardens.

Dr. Forster adds, that about ten years ago Mr. Curtis showed him a bed of seedlings of the second year in full flower in May, which had round capsules and orange flowers like *P. orientale*, but which he stated to have been derived from seeds of *P. bracteatum*. Mr. Curtis attributed the change to the bees having transported the pollen of that plant, but the uniform appearance of the whole bed led Dr. Forster to think this explanation doubtful. He further states, that he has been assured in the South of Europe that the best opium and in the largest quantity is obtained from *P. orientale bracteatum*; and as this plant suits the English soil and seeds freely, he thinks it might often be advantageously substituted for *P. somniferum*.

Read also a Note "On *Secale cornutum*, the *Ergot* of Rye;" and "On a species of *Asplenium*, related to *A. Trichomanes*, L." By A. Haro, M.D., of Metz, communicated by the Secretary.

In the latter communication Dr. Haro calls attention to a fern discovered by himself in the well of an old castle. The well in which it was found is described as being large, four-cornered, and having at the top on one side a square window, freely admitting air and light. The opposite wall is lined with the fern, which lies flat upon the stones, to which the fronds are said to be attached throughout their length by slender roots, rendering it difficult to remove them even with a knife. Dr. Haro submitted the plant to a Professor of the faculty of Nancy, who regarded it as a new species, more distinct from *A. Trichomanes* than *A. viride* or *A. Petrarchæ*, and supplied the following descriptive characters of these four species:—

A. Trichomanes, frondes *patulæ*, *glabræ*, impari-pinnatæ; stipes nigrescenti-vernicosus, suprâ membranulâ crenulatâ et ab insertione pinnularum utrinque decurrente manifestè *appendiculatus*; pinnulæ mediæ *ovatæ* inæquilaterales, superiores oblongæ et basi obliquè cuneatæ, impar crenulata, omnes obtusæ *obtusè*que crenatæ.

A. HAROVII, frondes *decumbentes* saxoque fibrillis tenuissimis adfixæ, *glabræ*, impari-pinnatæ; stipes nigrescenti-vernicosus, suprâ membranulâ obsoletâ et ab insertione pinnularum utrinque decurrente *appendiculatus*; pinnulæ mediæ *hastato-rhomboidæ*, *trilobatæ*, superiores oblongæ basi obliquè attenuatæ vel cuneatæ, impar pinnatifida, omnes obtusæ sed *acutè* dentatæ.

A. viride, frondes *erecto-patulæ*, *glabræ*, impari-pinnatæ; stipes viridis, suprâ canaliculatus, *inappendiculatus*; pinnulæ mediæ ferè omnes ovato-

rhomboideæ, inæquilaterales, impar crenulata incisa, omnes obtusæ *obtusè*que crenulatæ.

A. Petrarchæ, frondes *erecto-patulæ*, *glanduloso-villosæ*, impari-pinnatæ; stipes obscurè nigrescens, suprà applanato-canaliculatus, *inappendiculatus*; pinnulæ mediæ *oblongæ* basi obliquè truncatæ vel *cuneatæ* et inde valdè inæquilaterales, pinnatifidæ, lobulis obtusis inæqualiter crenulatis, superiores supra rachin decurrentes.

December 6.

E. Forster, Esq., V.P., in the Chair.

William Roden, Esq., was elected a Fellow.

Mr. Lovell Reeve, A.L.S., exhibited a fine specimen preserved in spirit of the animal of *Panopæa Aldrovandi*, one of the largest of Acephalous *Mollusca*.

Read a portion of "An Essay on the Distribution, Vitality, Structure, Modes of Growth and Reproduction, and Uses of the Freshwater *Confervæ*." By Arthur Hill Hassall, Esq. Communicated by the Secretary.

December 20.

E. Forster, Esq., V.P., in the Chair.

A. H. Hassall, Esq., exhibited an Apple in which decay had been artificially induced by inoculating it with decayed matter from another apple containing filaments of Entophytal *Fungi*.

Read a continuation of Mr. Hassall's memoir on the Freshwater *Confervæ*.

Read also "Some further Observations on the Nature of the *Ergot* of Grasses." By Edwin John Quekett, Esq., F.L.S.

This paper contains the results of experiments made by the author with the view of determining the mode in which the sporidia of the fungus which he regards as the cause of *Ergot* are introduced into the infected grass.

In March 1840 twelve healthy grains of rye, of wheat and of barley were placed in a shallow glass vessel containing a sufficient quantity of distilled water to moisten them, and covered with a glass shade. When germination commenced an ergot of wheat of the preceding year was immersed in the water, the sporidia on its surface were detached, and the ergot itself was then removed. The same experiment was performed with sporidia obtained from an ergot of *Elymus sabulosus*. Several days afterwards, when the leaves had attained a length of three or four inches, the young plants were conveyed into the country and planted side by side in a garden. At the period of harvest there remained alive only four plants of the rye (one of which had been infected from the ergot of *Elymus*, and the remaining three from that of wheat), three of the barley and four of the wheat. Of the rye scarcely a single ear produced healthy grains, the paleæ being generally quite empty; but nine of the ears contained ergots, some furnishing only a single specimen, and others as many as six. The ears of the barley were filled with healthy grains, and only one apparently diseased grain was detected; while in the wheat the ears were full and without disease.

As in these experiments no grains from the same sample were sown which had not been subjected to the influence of the sporidia of the fungus, Mr. Quekett made in the following autumn another experiment with the view of supplying this deficiency. Twelve grains of rye, of wheat and of barley were again made to germinate under similar circumstances to the last, and the sporidia obtained from the surface of one of the ergots of rye produced in the first experiment were diffused in the water in which they grew. These were planted in October on the same estate, but not within half a mile of the former spot; and twelve healthy grains of each kind which had been carefully kept apart from the others were planted in the same locality. Very few of the plants arrived at maturity, and in August last there remained of the infected plants only two of rye, two of wheat, and one of barley; and of the uninfected plants one of each kind. On each of the plants of rye which had been subjected to the influence of the sporidia an ergot was discovered, and the ears as before were almost entirely devoid of healthy grains; while the plants of wheat and barley subjected to the same influence produced perfect ears and healthy grains. The three plants of rye, wheat and barley

planted at the same time without exposure to the sporidia of the fungus presented no unhealthy appearance.

Mr. Quekett argues that all the grains of rye subjected during germination to the influence of the sporidia of the fungus in both sets of experiments having produced plants infected with ergot, while the plants derived from grains not so subjected escaped disease, a convincing proof is afforded that their infection could not have been the effect of chance, but must have resulted from the artificial introduction of the sporidia; and that the infection of the rye only, while the wheat and barley escaped, is to be attributed to the greater susceptibility of the rye to infection, as proved by the much greater frequency of the production of ergots in that species of grain.

January 17, 1843.

E. Forster, Esq., V.P., in the Chair.

Francis G. P. Neison, Esq., William Maddox Bush, M.D., and William Osbern, Esq., were elected Fellows.

William Taylor, Esq., F.L.S., presented specimens of the seeds, oil, and oil-cake of *Camelina sativa*, Crantz, accompanied by some observations strongly recommending its cultivation in preference to that of flax for the production of oil.

Read the commencement of a memoir "On the Ovulum of *Santalum*, *Loranthus*, *Viscum*," &c. By William Griffith, Esq., F.L.S. &c.

February 7.

E. Forster, Esq., V.P., in the Chair.

Edward Forbes, Esq., Professor of Botany in King's College, London, was elected a Fellow.

The Rev. William Hincks, F.L.S., exhibited a specimen believed to belong to *Neottia gemmipara*, Smith. The specimen, which was

from the collection of Dr. Wood of Cork, was obtained by him from very near the original locality named by Mr. Drummond. Mr. Hincks stated that he had taken some pains in comparing the specimen, not only with the description, but also with the original sketch made by Mr. James Drummond on a blank leaf of the pocket-book in which he noted down the occurrences of the tour upon which he made the discovery of this curious plant. The specimen now exhibited was marked by Dr. Wood when fresh, and he had no doubt of its identity; and the result of Mr. Hincks's examination was a confirmation of this opinion.

Read the conclusion of Mr. Hassall's "Essay on the Distribution, Vitality, Structure, Modes of Growth and Reproduction, and Uses of the Freshwater *Confervæ*."

The author commences his memoir by a general notice of the circumstances under which the freshwater *Confervæ* are found, and the distribution of various species. As regards their vitality he is inclined to think that the lives of few species, if any, extend beyond the period of a year; while it is certain that very many perish after a few months or even weeks, and are reproduced, under favourable circumstances, twice or thrice in the course of the year: their tenacity of life is also very great.

In structure they exhibit great uniformity. An outer transparent membrane destitute of markings, but whose ultimate structure Mr. Hassall believes to be fibrous, invests a simple series of cells placed end to end, and containing a turbid almost colourless fluid, in which float a number of vesicular bodies of various sizes, the uses and nature of which are not satisfactorily ascertained. In some of them Mr. Hassall has noticed a dark central nucleus; and it is supposed that they are connected with the function of reproduction, and that they supply the material for the formation and growth of the cells and their investing membrane. Each cell, the author thinks, may be regarded as possessing a separate and independent existence; and consequently the entire *Conferva* is to be looked upon, like the associated zoophytes, as a compound or aggregated being.

The principal part of Mr. Hassall's observations on the growth of *Confervæ* has been already published in the 'Annals and Magazine of Natural History,' vol. ix. p. 431-2; and he has, since the reading of the present paper, published his observations on a mode of development not previously noticed by him, in the same Journal, vol. xi. p. 359. At the period of the former publication he was not aware of the observations of M. Morren, M. Dumortier and M. Mohl on the growth

of *Confervæ* by the subdivision of their cells; but he states that his views of the mode in which this subdivision is effected differ considerably from those of M. Morren. He does not believe that when the endochrome of a cell has become separated into two masses, leaving a transparent space between them, this space is occupied by a formative intercellular matter such as M. Morren describes. On the contrary, he states that the first indication of the partitions which are to divide the parent cell into two consists of a solution of the continuity of a portion of the periphery of the cell, the divided edges of which become inflected and gradually approach the centre, where they coalesce.

After dismissing as unphilosophical the doctrine of spontaneous generation, as well as the more recent theory which attempts to deduce the origin of productions so widely differing in their structure and modes of growth as *Mosses* and *Confervæ* from the same germ developed under different circumstances or in different media, the author proceeds to pass in review the mode of reproduction of the several genera of freshwater *Confervæ*, adopting for the most part the divisions of Vaucher, and comparing his own observations with those of that distinguished algologist.

In his account of the reproduction of the genus *Vaucheria*, he differs from Vaucher, who states that the horns (which he regards as the anthers) approach the globular cell containing the future spore. On the contrary, he affirms that it is the spore which approaches the horn, in contact with which it remains for some hours; and he adds that the sporiferous cell is perforated or prolonged into a tube at the place where it comes in contact with the horn. Of the function attributed to the latter by Vaucher he has no doubt. He finds also, in contradiction of Vaucher's statement, that enlargements of the filaments, distinct from the reproductive apparatus, occur in all the species of *Vaucheria*; but he regards their presence as unconnected with reproduction, their purpose being possibly to assist in sustaining the plant on the surface of the water.

The most important of Mr. Hassall's observations on the genus *Conjugata* of Vaucher (including the more modern genera *Zygnema*, *Tyndaridea* and *Mougeotia*), viz. the development of the spores without conjugation of the filaments by the confluence of the contents of two adjoining cells of the same filament, was published by him in the 'Annals and Magazine of Natural History,' vol. x. p. 34. To his account of the reproduction of this genus he adds, that the filaments of the different species never grow in an entangled manner, but on the contrary always lie, when undisturbed, parallel to each other,

thus allowing of the regular union of the filaments, which could not otherwise take place. So remarkable is this arrangement, that Mr. Hassall states it to be alone sufficient to enable us at once to recognize a species as belonging to the *Conjugating Confervæ*.

On the reproduction of *Hydrodictyon* and *Polysperma* (*Lemania*, Bory) Mr. Hassall offers no observations of his own. The account given by Vaucher of that of *Batrachospermum* (including also *Chetophora* and *Draparnaldia*) has been since doubted, but Mr. Hassall thinks that he has verified it by observations on *B. plumosum*. On the other hand, he believes Vaucher's account of the reproduction of *Prolifera* to be in a great measure inaccurate. The enlargements of the filaments are doubtless connected with reproduction, but not, he thinks, in the manner supposed by Vaucher, while what Vaucher regarded as the young proliferous offspring appear to him to be parasitic growths, to which *Confervæ* are peculiarly liable.

Having completed his review of the genera of freshwater *Confervæ* noticed by Vaucher, Mr. Hassall next proceeds to call attention to the mode of reproduction occurring in a group of which he believes himself to have first ascertained the true characters, and which he has denominated *Vesiculiferæ*. His observations on this group have been already published in the 'Annals and Magazine of Natural History,' vol. x. p. 336, &c. In these observations he had described as the usual mode of reproduction in that group the formation of the spores without union of the filaments by the intermingling of the contents of two contiguous cells in the same filament; and had questioned the motion and development of the zoospores as described by M. Agardh the younger. In his communication to the Society he adds some extracts from letters which he had since received from Mr. Ralfs, who describes the disintegration of the sporular masses and the vivid motion of the separated granules in *Draparnaldia tenuis* and *Sphæroplea crispa*, and adduces the testimony of Mr. Borrer and Mr. Berkeley to the same fact. And Mr. Hassall himself, in a note under date of the 7th of April, retracts his objections to the motion and development of zoospores in the *Vesiculiferæ*, and states his belief that they possess a double mode of reproduction, that which he had described as occurring by means of true spores being the perfect form.

Mr. Hassall's observations on the reproduction of the branched *Confervæ* have been published, since the reading of his paper before the Society, in the 'Annals and Magazine of Natural History,' vol. xi. p. 360, &c. With regard to the genus *Meloseira*, Mr. Hassall believes, from the occurrence of vesicles in the filaments similar to those of the

Vesiculifera, that its true position will be with them. The *Vesiculifera composita*, Hass., Ann. Nat. Hist. x. p. 394, is identical with *Meloseira varians*, Agardh.

The paper concludes with some remarks on the various uses of the freshwater *Confervæ*.

February 21.

E. Forster, Esq., V.P., in the Chair.

Frederick Blundstone White, M.D., and Edward Doubleday, Esq., were elected Fellows.

The Rev. F. W. Hope, M.A., F.L.S., &c., exhibited an extensive collection of engraved Portraits of Linnæus, accompanied by a list of such as had fallen under his observation, and notices of the more important among them.

March 7.

The Lord Bishop of Norwich, President, in the Chair.

Thomas Corbyn Janson, Esq. and William Hammond Solly, Esq., were elected Fellows.

J. O. Westwood, Esq., F.L.S., presented specimens of the aerial processes of the roots of *Sonneratia acida*, L., sent by Mr. Templeton from Ceylon, and described by him as affording a wood of an extremely light and close texture, admirably adapted for lining insect-boxes, on account of the facility with which it admits, and the tenacity with which it retains, the finest pins.

Read a continuation of Mr. Griffith's memoir "On the Ovulum of *Santalum*," &c.

March 21.

The Lord Bishop of Norwich, President, in the Chair.

Mr. Arthur Henfrey was elected an Associate.

J. Janson, Esq., F.L.S., exhibited living flowering plants of the "hungry rice" of Sierra Leone, *Paspalum exile*, Kipp., described at p. 157, raised from seeds brought from Sierra Leone by Robert Clarke, Esq.

Read a memoir "On *Pectinura*, a new genus of *Ophiuridæ*, and on the species of *Ophiura* inhabiting the Eastern Mediterranean." By Edward Forbes, Esq., F.L.S., Professor of Botany in King's College, London.

Professor Forbes states that in his late researches in the Ægean Sea he found ten species of Starfishes of the order *Ophiuridæ*, several of which are undescribed. In the present memoir he confines himself to those belonging to the genus *Ophiura*, and to an allied genus, hitherto uncharacterized, to which he gives the name of *Pectinura*. This genus is founded on a small starfish brought up by the dredge from the depth of 100 fathoms on the coast of Lycia, and is characterized as follows:—

PECTINURA.

Corpus orbiculare, squamosum, granulosum, ad peripheriam radiatum; radiis simplicibus, squamosis, in corporis discum subprolongatis; squamis radiorum lateralibus adpressis, in marginibus superioribus spiniferis; ossiculis ovarialibus binis in corporis lobos non productis.

P. VESTITA, disco orbiculari, radiis convexiusculis; squamis superioribus rotundatis: lateralibus 8 spiniferis.—Lat. disci $\frac{1}{2}$ unc.

Professor Forbes states that he should scarcely have ventured to establish a genus on the single specimen of this species which he possesses, and which is somewhat imperfect in the rays, had he not had an opportunity of examining a large foreign species, which shows it to be a well-marked genus, having a rather closer affinity with *Ophiura* than with *Ophiocoma*. It differs from the former in having the disc clothed with granules, in the absence of the pectinated scales embracing the origins of the rays, and in the ovarian plates (not soldered into one as in *Ophiura*) not encroaching on the body; and from *Ophiocoma* by the lateral ray-plates overlapping each other and the posterior ray-plates as in *Ophiura*, and instead of having the spines on a transverse ridge or keel having them articulated to their superior margins, so that when the animal is dead they lie close to the rays and do not bristle out as in *Ophiocoma*.

Of *Ophiura* Professor Forbes found three species, *O. texturata*, *O. albida*, and a new species to which he gives the name of *O. abyssicola*, on account of its being found in deeper water than any recorded starfish, at the depth namely of from 150 to 200 fathoms. A comparison of the characters of this new species with those of its described allies, has enabled him to revise the characters of the genus *Ophiura* as follows :—

OPHIURA, Lam., Agass.

Corpus orbiculare, squamosum, læve, ad peripheriam radiatum; radiis simplicibus, squamosis, in corporis discum prolongatis, ad origines squamis pectinatis adpressis; squamis radiorum lateralibus adpressis, in marginibus superioribus spiniferis; ossiculis marginis ovarialibus simplicibus, in corporis lobos productis.

The following are the specific characters of the *Ægean* species :—

O. texturata, Lam. Squamis pectinatis ad radiorum origines plus quam 20-dentatis, ossiculis ovarialibus lyratis, radiis carinatis; squamis superioribus transversè oblongis: lateralibus 7 spiniferis.

O. albida, Forbes. Squamis pectinatis ad radiorum origines 16-dentatis, ossiculis ovarialibus scutatis, radiis convexis; squamis superioribus triangularibus: lateralibus 4 vel 5 spiniferis.

O. ABYSSICOLA, squamis pectinatis ad radiorum origines binis 5—9-dentatis, ossiculis ovarialibus pentagonis, radiis carinatis; squamis superioribus quadratis: lateralibus 3 vel 4 spiniferis.—Lat. disci $\frac{2}{3}$ unc.

Read also a continuation of Mr. Griffith's memoir "On the Ovulum of *Santalum*," &c.

April 4.

E. Forster, Esq., V.P., in the Chair.

George Suttor, Esq., was elected a Fellow.

Read a continuation of Mr. Griffith's memoir "On the Ovulum of *Santalum*," &c.

April 18.

The Lord Bishop of Norwich, President, in the Chair.

Robert Armstrong, M.D., Nathaniel Buckley, Esq., Charles Pope, M.D., and Thomas West, M.D., were elected Fellows.

Read the conclusion of Mr. Griffith's memoir "On the Ovulum of *Santalum*, *Loranthus*, *Viscum*," &c.

In this paper, dated "Malacca, March 28th, 1842," Mr. Griffith proposes to supply many of the deficiencies in his two memoirs on the ovula of *Santalum*, *Loranthus* and *Viscum*, published in the 18th vol. of the Society's "Transactions," to correct some important mistakes, and to extend his inquiries to another genus of the natural family of *Santalaceæ*, viz. *Osyris*. With this view he gives a detailed description of the progress of the development of the embryo, so far as he has been enabled to observe it, in *Santalum album*, *Osyris Nepalensis*, *Loranthus bicolor*, *Loranthus globosus* and two species of *Viscum*; each of which subjects is illustrated by an extensive series of microscopical drawings. In connection with these details he proceeds to remark at some length on the four following points:—1. the solidity of the ovarium and the appearance of the ovulum after fecundation, or rather after the action of the pollen on the stigmatic surfaces; 2. the reduction of an ovulum to the nucleus or to the embryonary sac; 3. the embryonary sac; and 4. the origin of the embryo. The following is the summary given by him of his ideas of the structure of *Santalum*, *Osyris*, *Loranthus* and *Viscum*:—

"In *Santalum* the ovulum consists of a nucleus and an embryonary sac, prolonged beyond both the apex and base of the nucleus: the albumen and embryo are developed in the parts above the septum [in the exerted portion of the sac], the parts below and the nucleus remaining unchanged. The embryo is developed from the pollinic vesicle. The seed has no actual proper covering, and no other theoretical covering than the incorporated upper separable parts of the embryo-sac.

"In *Osyris* the ovulum is reduced to a nucleus and an embryonary sac, which is prolonged in the same directions as in *Santalum*, but not to such a degree beyond the apex of the nucleus. The seed is formed outside the embryo-sac, and is absolutely without proper tegument, or whatever covering it may have did not enter into the composition of the ovulum. The embryo appears to be developed at some distance from the anterior end of the pollen tube.

"In *Viscum* the modifications appear to me to be two: in the one an evident cavity exists in the ovarium, and the ovulum appears to be reduced to an embryonary sac hanging from one side of the base of a nipple-shaped or conical placenta. In the other the ovulum is reduced to an embryonary sac, but this is erect, and has no such obviously distinct point of origin as in the first. In both the albumen has no other proper covering than the incorporated embryonary sac; and, at least in the last, the embryo appears to be a direct transformation of the pollinic vesicle.

“In *Loranthus* each ovulum appears to be reduced to an embryonary sac, the albumen is developed either partly within the sac, or entirely, or almost entirely, without it. The embryo is a growth from the ends of the continuations of the pollen tubes outside the anterior ends of the embryo-sacs, and is, in one modification, exemplified by *L. globosus*, up to a certain period exterior even to the albumen. In *L. bicolor* the albumen has no proper tegument; in *L. globosus* it may be supposed to have a partial one in the incorporated albuminous part of the embryo-sac.

“The gradation of structure appears to me to be tolerably complete. One modification of *Viscum*, in my opinion, tends to show that in *Santalum* the first steps towards the disappearance of the usual nucleus take place. *Osyris* seems to me to indicate that a similar tendency may affect the embryonary sac; and *Santalum* appears to me to allude to a reduction in the embryo-sac to the form of that of *Osyris*. Nor is this all, *Osyris* has its albumen and embryo developed outside that end of the sac to which the pollen tubes are applied: *Loranthus bicolor* has the same developed outside the opposite end of the sac. And the partial development of the albumen in the embryo-sac of *Loranthus globosus* may perhaps be a passage to its development outside that sac in *L. bicolor*.

“The novel points of structure and development pointed out in this paper are, so far as I know, the possibility of the separation of a continuous membranous embryo-sac into two distinct parts, of which the lower remains unchanged, though it would almost appear from *Osyris* to be the most permanent; the presence of the embryo-sac not being necessarily connected with its forming one of the constituent parts of the young or of the mature seed; the longitudinal percursion of the embryo-sac by the pollen tubes; the formation of the albumen either only partially within the embryo-sac, or almost entirely, if not quite so, without it; the confluence of the albumina of several sacs into one albumen; the growth of the embryonic tissues from the continuations of the pollen tubes outside the embryo-sac; the possibility of one embryo resulting from a combination of several pollen tubes, and of its becoming interior to the albumen, although it may have been for some time entirely exterior to it.

“I make no mention of the posterior prolongations of the sacs, in doubt of the true nature or origin of the so-called chalazal apparatus of *Thesium*; or of the growth of the embryonic tissues from the ends of the pollen tubes, in doubt of my having misunderstood the observations of M. Schleiden, and in ignorance of those of M. Wydler.”

In a subsequent note Mr. Griffith notices certain peculiarities in

the development of the embryo in *Avicennia*, and in a genus which, notwithstanding its very curious anomalies, he considers referrible to *Santalales*, and to which he gives the following characters:—

MODECCOPSIS.

Calyx superus; limbo minutissimo, 5-dentato. *Petala* 5, disco epigyno inserta, basi utrinque uni-glandulosa. *Stamina* 5, petalis opposita. *Ovarium* omninò inferum, 1-loculare. *Ovula* 3, ex apice loculi! pendula, anatropa! *Stylus* brevis. *Stigmata* 3, subcapitata. *Fructus* subdrupaceus, monospermus, calyce demùm soluto quasi 5-valvis!! *Semen* unicum, pendulum; endocarpio osseo inclusum. *Albumen* copiosum. *Radiculæ* locus superus.

Frutex scandens, cirrhifer, cirrhis axillaribus. Folia alterna, exstipulata, oblongo-ovata, basi subcordata et quinque-venia. Flores minuti, inconspicui. Glandulæ apice piliferæ! Fructus abortu solitarius, cum pedicello clavato-pyriformis; valvæ intùs rubræ.

Habitus Modeccæ; Rhamneis mediante Gouaniâ analoga? Santalaceis potiùs affinis.

Hab. in Assamiâ Superiore, Oris Tenasserim, Mergui Provinciâ, Malaccâ.

May 2.

The Lord Bishop of Norwich, President, in the Chair.

M. Achille Richard and M. Joachim Frederic Schouw were elected Foreign Members; John Salt, M.D., was elected a Fellow; and Mr. Thomas Sansom an Associate.

In consequence of the recent death of H.R.H. the Duke of Sussex, the Meeting adjourned.

Anniversary Meeting.

May 24.

The Lord Bishop of Norwich, President, in the Chair.

His Majesty the King of Saxony was elected an Honorary Member.

The President opened the business of the Meeting, and having stated the number of Members whom the Society had lost during

the past year, the Secretary read the following notices of some of them :—

The deaths among the *Fellows* have been six in number.

The Rev. James Dalton was educated at Clare Hall, in the University of Cambridge, where he took his Bachelor's degree in 1787, and that of Master of Arts in 1790. He was much attached to botanical pursuits, and well acquainted with our native plants, and especially with the *Carices* and *Mosses*. Among the latter he was the first discoverer of several new species, and his name has been commemorated by Sir W. J. Hooker in a well-known genus. Many of his observations are recorded by Sir James E. Smith in his 'English Botany' and 'English Flora.' He became a Fellow of this Society in 1803; and in 1805 he was presented by the King to the living of Croft in Yorkshire, where he continued to reside until his decease, on the 2nd of January in the present year, at the age of 78.

John Latham, M.D., formerly a physician of considerable eminence and extensive practice, was born at Gawsworth in the county of Chester, Dec. 29, 1761, and educated at Brasen-nose College, Oxford, where he took his Doctor's degree in 1788. In the same year he established himself in London, and became successively physician to the Middlesex, the Magdalen, and St. Bartholomew's Hospitals, and Fellow and President of the Royal College of Physicians. He was elected a Fellow of this Society on the 16th of March 1790, and was consequently its senior member. He died on the 20th of April in the present year at Bradwall Hall, Cheshire, to which place he had retired from the fatigues of practice in 1829. His published works are wholly medical.

James Lynn, M.D.

Rev. Thos. Newman, M.A.

Rev. Thos. Newton, M.A.

John Gage Rokewode, Esq., for many years Director of the Society of Antiquaries, was the fourth and youngest son of Sir Thomas Gage of Hengrave Hall in the county of Suffolk, the sixth baronet of that family, and brother of the late Sir Thomas Gage, also a Fellow of our Society and a botanist of considerable attainments, especially in his knowledge of the family of Lichens. On the death of his second brother, he assumed the name of Rokewode and entered into possession of Coldham Hall and the property belonging to it, in pursuance of a settlement executed in 1728 by one of his ancestors. Mr. Gage Rokewode was devoted from an early period of his life to the study of the antiquities of his native country, to the illustration of which his numerous publications in the 'Archæologia,' in the 'Vetusta

Monumenta,' and in various separate works, have greatly contributed.

The Society has also to regret the loss of two of its *Associates*.

Mr. Daniel Cooper was the second son of Mr. John Thomas Cooper, well known as a distinguished practical chemist. He was educated for the medical profession, and assiduously devoted himself to the study of natural history, and more especially of botany and conchology. He took an active part in the establishment of the Botanical Society of London; and subsequently became one of the Assistants in the Zoological Department of the British Museum, and delivered Botanical lectures at various Medical Schools. On quitting the British Museum he entered the Medical Service of the Army, and was for some time employed in the Museum at Fort Pitt, Chatham; whence he was appointed Assistant-Surgeon to the 17th Lancers, then stationed at Leeds. He died at the early age of 25, in the Cavalry Barracks of that town, on the 23rd of November 1842, about two months after joining the regiment, of a sudden attack of inflammation of the veins.

Soon after the establishment of the Microscopical Society he commenced the publication of a 'Microscopic Journal,' of which he edited nearly two annual volumes, the latter in conjunction with Mr. Busk. He published also a 'Flora Metropolitana,' 12mo, 1836, which constitutes a useful guide to the stations of the rarer plants found within a walk of the metropolis, and includes 'A List of the Land and Freshwater Shells found in the environs of London.' To this little work a Supplement was added in 1837; and he also superintended a new edition of Bingley's 'Useful Knowledge' remodelled and with considerable additions.

Mr. Alexander Matthews, an active and intelligent botanical collector, died at Chachapoyas on the Andes of Peru, on the 24th of November 1841. He had been engaged for many years in forming and transmitting to Europe collections of Peruvian and Chilian plants; and was the first discoverer of many species of great interest and beauty, which have been described, from the specimens gathered by him, chiefly in Sir W. J. Hooker's various publications, in which also occasional letters from him on the subject of his botanical pursuits will be found.

The President also announced that two Foreign Members, eighteen Fellows and six Associates had been elected since the last Anniversary.

At the election which subsequently took place, the Lord Bishop of

Norwich was re-elected President; Edward Forster, Esq., Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out: viz. Arthur Aikin, Esq.; Rev. Frederic William Hope; William Horton Lloyd, Esq.; Richard Owen, Esq., and William Yarrell, Esq.

The Treasurer reported that the Subscriptions hitherto received in aid of the fund for relieving the Society from its incumbrances amounted to 98*l.* 14*s.**

June 6.

Edward Forster, Esq., V.P., in the Chair.

Thomas Turner, Esq., and James Tulloch, Esq., were elected Fellows.

Read the conclusion of Professor Forbes's memoir "On the *Ophiurida* of the *Ægean* Sea."

The author commences this portion of his paper by a revised character of the genus *Ophioderma* of Müller and Troschel, as follows:—

* The following Subscriptions have been received subsequent to the publication of the List given at p. 150, making the total amount received up to the 31st of July, 994*l.* 3*s.*

| | £ | s. | | £ | s. |
|------------------------------|---|----|--------------------------------|----|----|
| William Atkinson, Esq. | 2 | 2 | James Charles Hurst, Esq.... | 2 | 2 |
| Robert John Ashton, Esq. ... | 5 | 0 | Mr. Abel Ingpen | 1 | 1 |
| Henry Beaufoy, Esq. | 5 | 5 | Capt. Theobald Jones, R.N., | | |
| William Bridgman, Esq..... | 5 | 5 | M.P..... | 5 | 0 |
| Lieut.-Gen. Sir Thomas M. | | | Benjamin Kennedy, Esq. ... | 2 | 0 |
| Brisbane, K.C.B..... | 5 | 0 | John Kidd, Esq., M.D. | 5 | 0 |
| Harford James Jones Brydges, | | | Mr. James Main | 1 | 1 |
| Esq. | 5 | 0 | Thomas White Mann, Esq.... | 4 | 4 |
| James Charles Dale, Esq. ... | 5 | 0 | John Martin, Esq. | 1 | 1 |
| M. Pakenham Edgeworth, Esq. | 5 | 0 | Jonh Miers, Esq. (2nd subscr.) | 5 | 5 |
| Mr. James Forbes | 1 | 1 | Roderick Impey Murchison, | | |
| Rev. Henry Hasted (2nd | | | Esq. | 10 | 0 |
| subscr.) | 3 | 3 | Mr. William Pamplin | 1 | 1 |
| Rev. Henry Hawkes | 5 | 5 | John Reeves, Esq. | 5 | 0 |
| Mr. Joseph Henderson | 1 | 0 | Edward Rudge, Esq. | 5 | 0 |
| Thomas Charles Hope, Esq., | | | Rev. George Thackeray, D.D. | 5 | 5 |
| M.D. | 5 | 0 | John Windsor, Esq..... | 3 | 3 |

OPHIODERMA.

Corpus orbiculare, squamosum, granulosum, ad peripheriam radiatum; radiis simplicibus squamosis; disco in radiorum origines prolongato, infra poris genitalibus viginti; squamis radiorum lateralibus adpressis, in marginibus superioribus spiniferis, spinis simplicibus; ossiculis ovarialibus parvis, oralibus pectinatis.

The species on which this genus is founded, *Ophiura lacertosa*, Lam., is stated to be rare in the Ægean Sea, and is thus characterized:—

Oph. lacertosa.

O. radiis convexiusculis; squamis superioribus transversè oblongis: lateralibus 8-spiniferis: inferioribus quadratis.

Of the genus *Ophiomyxa* of the same authors, Professor Forbes also gives the following revised character:—

OPHIOMYXA.

Corpus pentagonale, coriaceum, læve, ad peripheriam radiatum; radiis simplicibus, interruptè squamosis; disco in radiorum origines prolongato; squamis radiorum lateralibus spiniferis, spinis serrulatis; ossiculis ovarialibus binis parvis, oralibus spinis serrulatis armatis.

The Ægean species, *O. lubrica*, Forbes, was found in between ten and twenty fathoms water in the sea of the Cyclades.

For a new species not uncommon in the seas of the Archipelago, the author establishes the genus—

OPHIOPSILA, Forbes.

Corpus orbiculare, coriaceum, læve, ad peripheriam radiatum; radiis simpliciter squamosis, infra discum insertis; squamis lateralibus subcarinatis spiniferis, spinis simplicibus; ossiculis ovarialibus parvis, oralibus ad latera nudis.

OPH. ARANEA, Forbes.

Another new genus is constituted for the reception of the long-rayed, scaly and smooth-bodied *Ophiuridæ*, with simple tentacula and smooth spines, and is characterized as follows:—

AMPHIURA, Forbes.

Corpus orbiculare, squamosum, læve, ad peripheriam radiatum; radiis simplicibus squamosis, infra discum insertis; squamis lateralibus subcarinatis spiniferis, spinis simplicibus; ossiculis ovarialibus parvis, oralibus ad latera nudis; cirrhis simplicibus.

Three species inhabit the Ægean Sea, of which one is undescribed. Their characters are thus given:—

A. FLORIFERA, Forbes.

A. disco squamis centralibus maximis rosulatis, scutellis ovatis disjunctis,

squamis radiorum superioribus quadratis : inferioribus trilobatis : lateralibus 3-spiniferis ; spinis brevissimis linearibus simplicibus.

A. neglecta, Forbes.

A. disco squamis centralibus parvis rosulatis, scutellis oblongis conjunctis, squamis radiorum superioribus quadratis : inferioribus oblongis : lateralibus 4—5-spiniferis ; spinis brevibus simplicibus.

Ophiura neglecta, Johnston.

A. Chiaji, Forbes.

A. disco squamis minutis rosulatis, scutellis cuneatis divergentibus apicibus approximatis, squamis radiorum superioribus lenticularibus : inferioribus quadratis sulcatis : lateralibus 4-spiniferis ; spinis longis simplicibus.

Ophiura filiformis, Chiaje (nec Müller).

Lastly, the author adopts the genus *Ophiothrix* of Müller and Troschel, with the following revised character :—

OPHIOTHRIX.

Corpus orbiculare, spinosum, ad peripheriam radiatum ; radii simplicibus, squamosis, squamis superioribus imbricatis, lateralibus carinatis spiniferis ; spinis serrulatis ; ossiculis ovarialibus parvis, oralibus ad latera nudis ; cirrhis pinnatis.

Ophiothrix Rosula is common in the Ægean Sea.

Figures are given of all the new genera and species, with numerous magnified details.

Read also a "Description of *Peltophyllum*, a new genus of Plants allied to *Triuris* of Miers, with remarks on their Affinities." By George Gardner, Esq., F.L.S. &c.

The plant described in the present communication was discovered by Mr. Gardner in the province of Goyaz, in the interior of Brazil, and the few specimens which he possesses are unfortunately all female. The following are its characters :—

PELTOPHYLLUM, Gardner.

Flores dioici. *Masc.* ignoti. *Fœm.* *Perigonium* 6-partitum, coloratum, patens, persistens ; laciniis ovatis, longè acuminatis ; acumine plano. *Ovaria* plurima, in tori apice sessilia, adpressa, libera. *Styli* ad apicem incrassati, obliquè truncati. *Fructus* ignotus.

Herba parvula Brasiliensis. Folia a scapo distantia, longè petiolata, peltata, valdè reticulata. Radix tuberosa, fibrosa. Scapus subramosus, basi squamosus ; pedunculis basi bracteatis, unifloris ; floribus luteis.

Peltophyllum luteum, Gardn. Herb. Bras. n. 3570.

Mr. Gardner compares the female flowers of his plant with those of *Triuris*, to which it is evidently nearly related ; and discusses at some length the subject of their proper position in the natural system,

which he believes to be along with *Smilacæ* and the other orders of the group to which Prof. Lindley gave first the name of *Retosæ* and subsequently that of *Dictyogens*. He proposes to form a distinct order for their reception under the name of

TRIURACEÆ.

Herbæ parvulæ, perennes, rhizomate repente? *Folia* solitaria, a scapo distantia, longè petiolata, nervosa, integerrima. *Vaginæ* ad basin petiolorum membranacæ. *Scapus* subramosus, basi squamosus. *Flores* regulares, dioici; pedicellis unifloris, bracteatis. *Perigonium* corollinum, 3- vel 6-partitum, patens, persistens; laciniis longis, acuminatis, æstivatione basi valvatis; acumine interdum tubuloso, ante anthesin gytrato incluso. *Stamina* 3 vel 6? *Antheræ* extrorsæ, loculis disjunctis, imo androphoro magno carnosso centrali insertæ. *Ovaria* plurima, in tori apice sessilia, adpressa, libera. *Ovula* in loculis solitaria? *Styli* sublaterales, subulati, vel ad apicem incrassati et obliquè truncati. *Fructus* ignotus.

A figure of *Peltophyllum luteum*, with details, from the pencil of Mr. Miers, accompanied the paper.

June 20.

E. Forster, Esq., V.P., in the Chair.

Read "Notes on the Forest-trees of Australia." By George Suttor, Esq., F.L.S. &c.

Mr. Suttor states that the far greater number of these trees belong to the order *Myrtacæ*, and chiefly to the genus *Eucalyptus*. The species are very numerous, and many of them are still undescribed. They are generically known to the colonists as Gum-trees, and their distinctive names are chiefly derived from the colour of their barks; as for example, blue, black-butted, red, white, yellow, green, and spotted Gum-trees. There is also a Flooded Gum-tree, a Manna Gum-tree, and a so-called Mountain-ash, all belonging to the genus *Eucalyptus*. Many of the species are of gigantic growth, and the Black-butted Gum-tree in particular (*Eucalyptus globulus*, Labill.?) attains a size equal perhaps to that of any tree in the world. It derives its name from the blackness of its butt, caused, it is said, by exposure to the fires which are so frequently kindled by the natives in order to burn the grass and secure the game.

No. XIX.—PROCEEDINGS OF THE LINNEAN SOCIETY.

The Manna Gum-tree (*Eucalyptus mannifera*) is also of large growth, with widely spreading branches. Its manna drops in a liquid state most plentifully in the summer from the flowers and buds of the young shoots into the leaves, where it quickly becomes hardened, and falls thence to the ground in irregular lumps. It has a sweet agreeable taste, and is said to have all the properties of the manna of the shops. The wood contains a large quantity of saccharine sap, which soon becomes acid, and it is to this cause that Mr. Suttor attributes the power of resisting fire, so remarkable in all the Gum-trees, and which renders them peculiarly valuable in building houses.

Another species of *Eucalyptus*, the so-called Mountain-ash, which grows in the Blue Mountains, is a very fine timber-tree, which splits freely into long pieces and is brought to Paramatta for chair-rafts, &c. Its wood is very strong and elastic, and said to be equal in those respects to any wood in the world.

The Forest-mahogany of the colonists (*Eucalyptus robusta*, Smith) has strong large spreading branches, forming a very large head, and sweet-scented flowers. Its wood is heavy and close-grained, resembles the mahogany of Jamaica, and is used in Sydney for making chairs and bedsteads.

The timber-trees not belonging to the order *Myrtaceæ* consist of a few species of *Conifera*, the *Casuarina*, and the so-called Cedar (*Cedrela Toona*, Roxb.), the wood of which very much resembles the Honduras mahogany, and is very valuable to the colonists in fitting up their houses, making furniture, &c. The tree is of large growth, and has not been found in the interior, but generally on the low grounds of the coast rivers.

November 7.

R. Brown, Esq., V.P., in the Chair.

A letter was read from the Baron de Gersdorff, Resident Minister of the King of Saxony, addressed to the President, and stating that "the King will feel highly gratified in seeing his name enrolled on the list of Honorary Members of the Linnean Society of London, and that his Majesty has accordingly been graciously pleased to accept the Diploma transmitted by your Lordship, as President."

Dr. Bromfield, F.L.S., presented a specimen of a species of *Calamintha* found by him in the Isle of Wight and regarded as new.

Mr. Newman exhibited a specimen of *Trichomanes* lately found in the co. Kerry, and supposed to be distinct from *Tr. speciosum*.

Read a letter from Joshua Clarke, Esq., of Saffron Waldon, accompanying specimens of *Barkhausia setosa*, Dec., found in that neighbourhood, with a note on the characters and distribution of the species by Mr. Kippist, Libr. L.S.

Read also the commencement of "An Analysis of *Rhizanthæ*." By Wm. Griffith, Esq., F.L.S., being the first of a series of memoirs on Root-Parasites and their allies.

November 21.

E. Forster, Esq., V.P., in the Chair.

David William Mitchell, Esq. was elected a Fellow.

Read the conclusion of Mr. Griffith's "Analysis of *Rhizanthæ*," and his "Description of *Sapria*, a Himalayan genus related to *Rafflesia*."

December 5.

E. Forster, Esq., V.P., in the Chair.

Mr. Westwood, F.L.S., exhibited a box of *Æ*strideous insects recently received from Professors Zetterstedt and Dahlbom, with the view of determining the correctness of Mr. Bracy Clarke's conjecture as to certain characters, which, in his memoir published in the last Part of the 'Transactions' of this Society, he had regarded as sexual, and as proving that the *Æstrus Tarandi* and *Æ. Trompe* are sexes of the same species. Mr. Westwood stated that this collection contained both sexes of each of these species, and that it would consequently be necessary to reinstate these two species as well as several

others, which, on the same account, Mr. B. Clarke had sunk in his memoir.

Read "Observations on *Cytineæ* and on the genus *Thottea* of Rottböll," in continuation of Mr. Griffith's memoirs on Root-Parasites, &c.

December 19.

E. Forster, Esq., V.P., in the Chair.

William Ferrand Merson, M.D., William Tucker Allaway, M.D., John Hillier, Esq., and Sylvanus Hanley, Esq., were elected Fellows ; and Mr. Henry Denny an Associate.

Mr. J. T. Lay, Her Majesty's Consul at Canton, presented a box of specimens of the *Keih-seen-me*, a species of *Alga* related to *Nostoc*, and eaten as a delicacy among the Chinese.

The Secretary exhibited on the part of Mr. Newport, President of the Entomological Society, a specimen in spirits of a Neuropterous insect, *Pteronarcys regalis*, furnished with external branchiæ in its perfect state.

Read a paper "On *Carex saxatilis*, L., and an allied species." By Francis Boott, M.D., F.L.S. &c.

The allied species referred to was found in 1832 in Glen Phee, Clova, by the party accompanying Dr. Graham on his annual botanical excursion to the Highlands, and was considered as a form of *C. saxatilis*, L. ; but Dr. Boott, whose attention has lately been called to the subject by a letter from Mr. W. Wilson of Warrington, pointing out certain differences between the two plants, is led to regard it as a distinct species, which he names and characterizes as follows :—

Carex Grahami, spicis 4—5 cylindricis ferrugineis ; masculis 2 (rariùs 1) gracilibus acutis : fœmineis 2—3 subremotis crassis obtusis inferioribus pedunculatis evaginatibus subnatis, stigmatibus 2, perigyniis oblongo-ovatis rostratis bifurcatis inflatis nervosis suberectis ferrugineis (rariùs stramineis) basi pallidis squamâ ovatâ acutâ fuscâ apice albidâ nervo pallido duplò longioribus.

Of *Carex saxatilis*, L., Dr. Boott gives the following character :—

C. saxatilis, spicis 2—3 atropurpureis; masculâ 1 (rariùs 2) cylindricâ pedunculatâ: fœmineis 1—2 rotundatis ovatisve infimâ plus minusve pedunculatâ evaginatâ bracteâtâ erectâ, stigmatibus 2—3, perigyniis subglobois ovatisve rostratis emarginatis stipitatis patentibus enerviis atropurpureis basi pallidis squamâ ovatâ obtusiusculâ nigro-purpureâ apice albidâ nervo concolori longioribus.

C. saxatilis, *L. Fl. Lapp.* 259 (1737).

C. pulla, *Good. in Linn. Trans.* iii. t. 14 (1795).

Hab. in Alpibus Scotiæ, Norvegiæ, Lapponiæ, Sueciæ, Islandiæ, Insularum Færoensium.

The author enters at length into a critical examination of the original authorities which prove the *Carex pulla* of Goodenough to be the same with *Carex saxatilis*, L.; and points out the origin of the confusion of the latter with *C. rigida*, Good. He then examines more particularly the distinguishing characters of *C. Grahmi* and *C. saxatilis*; and adds that he should have no doubt of the specific distinction between them but for the observations of Drejer, who in his 'Revisio critica Caricum Borealium' describes, under the name of *C. pulla* β *fusca*, specimens from Iceland and Greenland closely agreeing with *C. Grahmi*, except that he makes no mention of the nerves of the perigynium, and observes that the Greenland specimens are so extremely variable that it could scarcely be believed that they belong to the same species. In the absence of precise information respecting the perigynium of the larger Greenland specimens, Dr. Boott is inclined to refer them, together with the specimens from the Rocky Mountains described by him in Sir W. J. Hooker's 'Flora Boreali-Americana' under the name of *C. saxatilis*, to *C. physocarpa*, Presl, a native of Nootka Sound. Of the latter his knowledge is derived from M. Kunth's "*Cyperographia*."

In conclusion Dr. Boott leaves it to future observation to determine the value of the specific character which he has given of *C. Grahmi*; whether it is to be considered as a distinct species, referred back to *C. saxatilis*, L., or transferred to *C. physocarpa*, Presl, repeating that at present he considers it, with Mr. Wilson, entitled to rank as a species.

Read also an "Account of the Trees producing Myrrh and Frankincense, as found in those parts of the coast of the Red Sea and Indian Ocean whence those Gums were obtained in the first dawn of Commerce." By Major W. C. Harris, late on an Embassy to the

Court of Shoa in Southern Abyssinia. Communicated by the Secretary.

Major Harris describes the Myrrh-tree (*Balsamodendron Myrrha*) as growing abundantly on the Abyssinian coast of the Red Sea to the Straits of Bab el Mandeb, over all the barren hill-sides of the low zone inhabited by the Danakil or Adaiel tribes. It is called *Kurbeta*, and there exist two varieties; one producing the better description of the gum being a dwarf shrub, with deeply serrated crisp leaves of a dull green; while the other, which yields a substance more like balm than myrrh, attains a height of ten feet, and has bright, shining, slightly dentated leaves. The myrrh, called *Hofali*, flows freely from any wound, in the form of a milky juice, possessing a perceptible acidity, which either evaporates or becomes chemically changed during the formation of the gum. The seasons for collecting it are in January, when the buds appear after the first rain; and in March, when the seeds are ripe. Every passer-by transfers such portions of it as he may find to the hollow boss of his shield, and exchanges it for a handful of tobacco with the next slave-dealer whom he meets on the caravan-route. The merchants also of the sea-coast, before returning from Abyssinia, send into the forests that gird the western bank of the river Hawash, and bring away considerable quantities of the *Hofali*, which is sold at a high price. The natives administer it to their horses in cases of fatigue and exhaustion.

The shrub which produces the balm of Mecca, *Balsamodendron Opobalsamum*, is found on the opposite Arabian coast at Cape Aden, where it is called *Beshán*, either the original of or a derivative from the word *Balsam*. It is the *Balissan* of Bruce, who did not meet with the true myrrh-tree. The balm flows copiously from any incision, and the æthereal oil speedily evaporating, a tasteless gum remains.

The Frankincense, Major Harris states, is found chiefly along the Somauli coast, in the neighbourhood of Cape Guardafui. At Bunder Maryah, twenty miles to the S.W. of Ras Feeluk, the mountains are three miles from the shore and attain a height of five thousand feet. Ascending a thousand feet a plain presents itself, bounded on every side by precipitous mountains, studded with the Frankincense and Gum-Acacia trees, although looking bare from the total absence of under-wood. The frankincense-trees invariably grow from the bare and smooth sides of the white marble rocks, or from isolated blocks of the same scattered over the plain, without any soil whatever. From the base of the trunk, and about treble its diameter, a round thick substance is thrown out, of a nature between bark and wood,

adhering most firmly to the stone, and resembling at a distance a mixture of mortar and lime. The stem rises from the centre of this mass, and having first taken a bend outwards of several inches, rises straight to a height of forty feet. It throws out from the top short branches covered with a very bright green foliage, the leaves being narrow and rounded at the end, five or six inches in length by one broad, and crimped like the frill of a shirt, or rather like the sea-weed called by children on the English coast "the old gentleman's ruffles." The usual girth of the stem is from a foot to eighteen inches. The bark is perfectly smooth and consists of four distinct layers, the outermost of which is very thin; the two next of a singularly fine texture, resembling oiled letter-paper, perfectly transparent, of a beautiful amber-colour, and used by the Somaulis to write upon; and the innermost about an inch thick, of a dull reddish hue, tough and not unlike leather, but yielding a strong aromatic perfume. The wood is white and soft. On making a deep incision into the inner rind, the gum exudes profusely, of the colour and consistence of milk, but hardening into a mass by exposure to the air. The young trees produce the best and most valuable gum, the older merely yielding a clear glutinous fluid resembling Copal varnish and exhaling a strong resinous odour. During the S.W. monsoon the pastoral tribes in the neighbourhood of Ras Feeluk collect large quantities of frankincense, which they barter with the Indian Banyans, of whom a few reside at the villages along the Abyssinian coast. Boats from Maculla and from other parts of the Arabian coast also come across during the fine season and carry away the gums that have been accumulated, in exchange for a coarse kind of cotton cloth which is worn by the shepherds.

January 16, 1844.

E. Forster, Esq., V.P., in the Chair.

Thomas Harrison, Esq., M.D., Edward Hamilton, Esq., M.D., William Francis, Esq., Ph. D., Augustus W. Clement, Esq., M.D., and John Mussendine Camplin, Esq., were elected Fellows.

Read an extract from a letter addressed by John Ashton Bostock, Esq., Assistant Surgeon in H.M. 3rd Buffs, to his father John Bostock, Esq., M.D., F.L.S.

The letter is dated Agra, Oct. 21st, 1843, and describes the occurrences of a journey from Allahabad. The extract is as follows: "Between Cawnpore and this place I witnessed one of the extraordinary phænomena peculiar to tropical climates, viz. a flight of locusts. The direction of the flight was nearly due east, and the rate four miles per hour; and you will form some idea of the immense host, when I tell you, that travelling at the same rate and in the opposite direction, I was between two and three hours in passing through them. During the whole time, the horizon, as far as the eye could reach, was darkened, and every nearer object was obscured. On looking directly upwards the appearance was that of a very heavy snow-storm, and the ground, which was covered by them, resembled the fields strewed by the dried leaves of the autumn. Several of them flew into my Palken. They were $2\frac{1}{2}$ inches long, of a pink colour, marked with dark brown. The poor natives were shouting and endeavouring to prevent their devouring the crops, to which they prove most destructive."

Read also a continuation of the series of memoirs on the *Radiata* of the Eastern Mediterranean. By E. Forbes, Esq., F.L.S., Professor of Botany in King's College, London.

The memoir now read relates to the order *Echinidæ*, the Mediterranean species of which Professor Forbes states to amount in number to between twelve and fifteen. Of these nine occur in the seas of the Egean Archipelago, at various depths, some being found as low as a hundred fathoms. They are enumerated as follows:—

Fam. SPATANGACEÆ.

Gen. SPATANGUS, L.

Spatangus purpureus is rare to the east of the Morea, but more abundant and attaining a larger size on the coasts of Sicily and Malta. The Mediterranean specimens are in every respect identical with the British, and *Spat. meridionalis* of Risso is the same species.

Gen. BRISSUS, Klein.

Fragments of Sea-urchins belonging to this genus were repeatedly found in very deep water on several parts of the Archipelago and on the coast of Asia Minor, but too imperfect to admit of determination. One of these, probably belonging to a new form, was taken in mud at the depth of from 100 to 140 fathoms.

Gen. AMPHIDETUS, *Agassiz.*

Of this genus Prof. Forbes describes a new species nearly related to *Spat. cordatus* of Pennant, which he characterizès as follows:—

A. Mediterraneus, dorso convexiusculo; depressione subplano; impressione scutiformi, extremitate anali truncatâ impressâ caudâ prominenti acuminatâ, ventre plano; areâ post-orali lanceolatâ.—Long. $1\frac{7}{8}$ unc.; lat. $1\frac{7}{8}$; alt. $1\frac{1}{4}$.

Of this species, which was taken in a few feet water in the Island of Paros by Capt. Graves, but which Prof. Forbes has dredged as deep as twenty fathoms, the author gives a detailed description; and particularly notices the occurrence on each side of the madreporiform plate, obliquely behind the posterior ovarian foramina, of a minute perforation, surrounded by a circle of minute spiniferous tubercles. Similar perforations similarly encircled are seen between each of the ovarian foramina laterally and anteriorly, so that their total number is five. These, the author states, are the eye-sockets with their protecting spines or eye-lids. Their presence, he adds, is unnoticed in any description of the species of *Spatangaceæ*, though they are doubtless to be found in all.

Fam. CLYPEASTERIÆ.

Gen. ECHINOCYAMUS, *Leske.* Fibularia, *Lam.*

Echinocyamus pusillus is abundant throughout the Egean Sea, being thrown up in shell-sand and equally plentiful at all depths between one and a hundred and ten fathoms. Dead specimens were even dredged at a depth of two hundred. Specimens taken alive in the European seas are undistinguishable from those found in the ancient tertiaries of the Paris basin, in the miocene strata of Touraine and the Crag, and in the pliocene beds of the Mediterranean. Prof. Forbes regards *Fibularia Tarentina*, Lam., *Fib. Ovulum* and probably *Fib. angulosa* as synonyms of this species.

Fam. CIDARIDÆ.

Gen. ECHINUS, *L.*

Echinus esculentus, L., was very rarely met with in the Egean Sea; while, on the other hand, *Ech. lividus*, Lam., was most abundant, being always littoral and covering the rocks within a fathom of depth, but never, so far as Prof. Forbes has observed, boring into them.

A living species which the author is unable to distinguish from the fossil *Echinus monilis*, DeFr., was found very abundantly at the depth of between twenty and a hundred fathoms. It would appear

to be the same with *Ech. pulchellus*, Risso, and a variety *Ech. decoratus*, Agass. It is also *Ech. miliaris* of Grube, but very distinct from the true *Ech. miliaris*.

GEN. CIDARIS, Lam.

Species of *Cidaris Hystrix*, Lam., were frequently met with, but perfect specimens are not so common. They are occasionally, however, found in considerable numbers and appeared to be gregarious, between thirty and forty living examples having been taken in a single dredge in seventy fathoms water off Cape Krio in Asia Minor, the site of the ancient city of Cnidos. The author gives a particular account of the differences between this species and *Cid. papillaris* of the British and Norwegian seas, and observes that it possesses the power of climbing up branching bodies by means of its spines alone. He thinks it possible that the perforated tubercles of this genus may have reference to this habit, the additional ligament giving additional firmness to the long spine.

February 6.

R. Brown, Esq., V.P., in the Chair.

Read "Descriptions of the Nests of two Hymenopterous Insects inhabiting Brazil, and of the species by which they were constructed." By John Curtis, Esq., F.L.S.

The materials for this paper were obtained by Mr. Curtis from a collection in the possession of Lord Goderich, to whom it was presented by the Right Hon. Henry Ellis, on his return from his late special mission to Brazil.

The first insect described belongs to the family of *Tenthredinidae* and to the genus *Hylotoma* of Klug. But this extensive group, as Mr. Curtis has already remarked, affording sufficient grounds for further generic subdivision, he has distinguished the present species by the following name and characters:—

DIELOCERUS, Curt.

Antennæ articulo 3^{to} in mare furcato, piloso; in foemina simpliciter.
Tibiæ ante apicem espinosæ. *Clypeus* profundè emarginatus. *Labrum* orbiculare: *mandibulæ* graciles, acutæ, altera denticulo interno mi-

nuto: *maxillæ* subæqualiter bilobæ; *palpi* mediocres, 6-articulati, articulis tribus basalibus æqualibus, secundo tertioque crassis, quarto paulò minore, quinto omnium minimo quadrato, sexto gracili, haud reliquis longiore: *mentum* sub-semiovatum; *palpi* tuberculis prominentibus affixi, breves, crassi, 4-articulati, articulo secundo latiore, tertio omnium gracillimo longitudine primi: *labium* latum, trilobum.

This genus is most nearly related to *Schizocerus*, Latr. The species on which it is founded is named by Mr. Curtis *Dielocerus Ellisii*, and is described at length, and the distinctions pointed out between it and *Hylotoma formosa*, Klug, to which Mr. Curtis was at first inclined to refer it. Its economy is totally different from that of any other known species of *Tenthredinidæ*; the caterpillars of the solitary saw-flies, especially the larger species, forming single oval cocoons of a very tough and leathery material attached to twigs; and those even of the gregarious species placing their cocoons (which are oval cases of silk and gum) in an irregular manner with no unity of design. The caterpillars of *Dielocerus Ellisii*, on the contrary, which are evidently gregarious, unite to form on the branch of a tree, an oval or elliptical case, four or five inches long, narrowed superiorly, very uneven on its surface, and of a dirty whitish ochre in colour. The cells, thirty-eight in number in the nest examined, are placed at right angles to the branch, piled horizontally one above the other, unequal in size and irregular in form, those next the tree being pentagonal, the central ones hexagonal, and some of the outer ones nearly round or oval. In one of these cells Mr. Curtis found a dead female, and most of them had the exuvæ of the caterpillars remaining, but no shroud of the pupæ; he thinks the smaller cells may have been occupied by the males. At the end of each cell is a circular lid, formed of the same leathery material as the rest of the comb, which being cut round by means of the sharp mandibles, leaves an opening through which the saw-flies make their way. In two of the cells were found the dead caterpillars, which closely resemble those of the genus *Hylotoma*.

The author observes upon the dissimilarity of the mode of formation of this nest to that of any previously observed, the compound nidus (as far as hitherto known) being always the work of the parent insects for the protection of their young through the first three stages of their existence. In this case, however, it is formed by the larvæ themselves for the purpose of their own metamorphosis. The nearest approach to this economy seems to be the nidus formed by the maggots of some of the *Ichneumones adsciti*, whose silken cells are placed regularly in rows.

Mr. Curtis then proceeds to describe two species of *Schizocerus* from his own cabinet with the following characters :

S. nasicornis, ♂ niger, abdomine pallidè ochraceo apice nigro, alis nebulosis, pedibus fuscis ; femoribus 4 posterioribus ochraceis, capite anticè 1-dentato.

S. ochrostigma, ♂ fusco-niger, alis obscurè hyalinis : costâ stigmatè que flavis, pedibus ochraceis ; tibiis tarsisque posticis fuscis.

The other nest brought home by Mr. Ellis is that of a wasp of the Fabrician genus *Polistes*, but differing apparently from any of the species hitherto recorded as forming similar habitations. The insect by which it is constructed is thus characterized :

Myraptera brunnea, sericeo-fusca, pedibus ochraceis, femoribus genibus tibiisque 4 posterioribus (nisi basi) fuscis, maculis duabus in genis flavis.

The nest is attached to a twig not much more than an eighth of an inch in diameter. It is eight inches long and fifteen in circumference, pear-shaped, and having on its outer margin a hemispherical tubercle pierced with a circular hole a little more than half an inch in diameter. The materials of which the nest is composed are very substantial ; and the external undulations allow of the tracing of four layers of comb. Many of the neuters fell out on shaking, but neither males nor females were detected. The specimen being unique, Mr. Curtis has not cut it open, but he entertains no doubt that its structure is very similar to that of the nest of *Polistes nidulans*, figured by Reaumur. The following characters are those of a nearly allied species, of which numerous neuters were contained in the same collection :

Myraptera elegans, sericeo-nigra, capite thorace abdomineque lineis cingulisque fulvis, tibiis tarsisque ochraceis.

Mr. Curtis adds a list of the nine species referred to the genus *Polistes*, and which should be distributed into four genera, distinguished by the structure of the trophi ; no assistance being derivable from the form of the antennæ or the neuration of the wings. They are as follows :

I, Abdominis petiolo brevi sensim incrassato.

1. *Polistes Gallica*, L.
2. ——— *Actæon*, Hal. The nest resembles the foregoing.
3. ——— *Africana*, Pal. de Beauv.

II. Abdominis petiolo brevissimo, abruptè incrassato ; thorace posticè truncato.

4. *Epipone nidulans*, Fabr.
5. ——— *Lecheguana*, Latr.

III. Abdominis petiolo elongato, clavato; thorace abruptè truncato.

6. *Chartergus Morio*, St. Farg.

IV. Abdominis petiolo elongato, clavato; thorace posticè declivi.

7. *Myraptera scutellaris*, White.

8. ——— *elegans*, Curt.

9. ——— *brunnea*, Curt.

The paper was accompanied by a series of drawings illustrative of the insects and their nests.

February 20.

The Lord Bishop of Norwich, President, in the Chair.

Read a further portion of Mr. Griffith's memoir on Root-Parasites and their allies, comprehending a description of *Asiphonia*, a new genus of *Asarinæ*, and an account of *Hydnora*, Thb.

March 5.

E. Forster, Esq., V.P., in the Chair.

Wm. Hopkins Milne, Esq., was elected a Fellow.

Read a paper "On *Spiranthes gemmipara*." By Charles Cardale Babington, Esq., M.A., F.L.S., F.G.S. &c.

Two specimens of this very rare plant were first found by Mr. James Drummond in or about the year 1810, near Castletown, Bearhaven, in the county of Cork, "opposite the western redoubt, growing in a salt-marsh near the shore." One of these was communicated to Sir James E. Smith, who published it in his 'English Flora' under the name of *Neottia gemmipara*, with a description furnished by Mr. Drummond. Within these few years the plant has been again discovered near to, but probably not in exactly the original spot, by Dr. P. A. Armstrong, who on the 30th of September 1843 conducted Mr. Babington and Mr. E. Winterbottom to the station, where they saw about twelve specimens, several of which had been

destroyed by cattle, and all were in rather an advanced state of flowering.

From the specimens then collected Mr. Babington gives a detailed description of the plant, which differs in a slight degree from that furnished to Sir J. E. Smith by Mr. Drummond. He thinks it may fairly be referred to the genus *Spiranthes*, although differing from the other European species in some particulars; the most remarkable of these differences consisting in the connexion of all the sepals with the two lateral petals. The difference in habit is considerable in consequence of the great density of the spike, and the arrangement of the flowers in three spiral lines*.

A notice of a specimen of this plant, exhibited before the Society on the 7th of February 1843, by the Rev. William Hincks, F.L.S. &c., will be found at p. 162 of the 'Proceedings.'

Read also a continuation of Mr. Griffith's memoir, comprehending the parts relating to *Cytinus* and to *Mystropetalon*.

March 19.

E. Forster, Esq., V.P., in the Chair.

Thomas Bridges, Esq., was elected a Fellow.

Read the commencement of a "Monograph on the Class *Myriapoda*, Order *Chilopoda*; with observations on the general arrangement of the *Articulata*." By George Newport, Esq., Fellow of the Royal College of Surgeons, President of the Entomological Society, &c. Communicated by the Secretary.

* In a subsequent communication Mr. Babington states that he has identified the Irish plant with specimens of *Spiranthes cernua*, Rich., from North America, in the herbarium of Sir W. J. Hooker.

April 2.

R. Brown, Esq., V.P., in the Chair.

Robert Donaldson, Esq., M.D., and Joseph Exall, Esq., were elected Fellows.

Read a continuation of Mr. Newport's "Monograph on the *Myriapoda Chilopoda*."

April 16.

E. Forster, Esq., V.P., in the Chair.

John Allcard, Esq., was elected a Fellow.

Read the conclusion of Mr. Newport's "Monograph on the *Myriapoda Chilopoda*."

Mr. Newport commences his memoir by remarking on the smaller degree of attention which has been paid to *Myriapoda* than to any other class of *Articulata*. His inability, from this circumstance, satisfactorily to identify the specimens in the anatomical examination of which he was engaged, induced him to undertake a complete revision of the class, as far as the materials within his reach, and contained in the cabinets of the Rev. F. W. Hope, the British Museum, the United Service Museum, that of the Zoological Society, and in the Linnean and Banksian collections in the possession of the Society, would admit.

After passing in review the characters of the class, and noticing the different views of authors with respect to its classification as a whole, Mr. Newport enters at length into the reasons which induce him, in accordance with Leach, Latreille and others, and in opposition to Professor Brandt, to separate the *Myriapoda* from true insects, and to place them, as a class, immediately before the *Annelida*.

He details his motives for preferring, with reference to the classification of the *Invertebrata*, a system founded on the skeleton and organs of locomotion, together with the nervous system, to that which is usually adopted, based on the organs of nutrition. Guided by these views he proposes to place the sub-kingdom *Articulata* at

the head of the *Invertebrata*, and (following in the steps of our distinguished countrymen Kirby and Spence) to commence with the Hexapods or true Insects, placing after these the Octopods or *Arachnida*, and the Decapods or *Crustacea*, to be followed by the *Myriapoda*, the *Annelida*, and the remainder of the *Articulata*.

The more important objections to this mode of arrangement are considered and answered; and the author next proceeds to examine the division of the *Myriapoda* into tribes and genera, on which subject he agrees, to a considerable extent, with Professor Brandt, whose plan he has followed closely in the formation of the families, sections and genera, and in the characters assigned to them, but whose division of the class into masticating and sucking *Myriapoda* he has been unable to adopt. The following is a synoptic table of the genera of the whole class:—

Class MYRIAPODA, *Leach*.

Ord. 1. CHILOPODA, Latr.—Caput latum, prominens. Corporis segmenta inæqualia; singula par unicum pedum ad segmentorum latera insertorum gerentia. Mandibulæ prominentes, acutæ, falciformes. Organorum sexualium apertura ad extremitatem analem.

Trib. 1. SCHIZOTARSIA, Brandt.—Antennæ pluri-articulatæ, graciles, corpore longiores. Tarsi longi, pluri-articulati, inæquales. Oculi compositi, prominentes, globosi.

Fam. 1. Cermatiidæ, Leach.—Scuta dorsalia 8; singula segmenta 2 ventralia obtegentia. Stigmata mediana.

Gen. 1. Cermatia, Illig.—Oculi prominentes. Caput transversum. Scuta dorsalia emarginata. Stomatum latera incrassata.

Trib. 2. HOLOTARSIA, Brandt.—Tarsi 3-articulati. Caput e segmentis 2 mobilibus efformatum. Antennæ corpore haud longiores, setaceæ vel filiformes, 14—60-articulatæ. Oculi stemmatosi, aggregati, simplices vel nulli.

Fam. 2. Lithobiidæ, Newp.—Scuta dorsalia 15, subquadrata, inæqualia; angulis elongatis, acutis. Coxæ posteriores excavationibus ovatis.

Gen. 2. Lithobius, Leach.—Ocelli numerosi. Caput latum, depressum. Labrum denticulatum.

Gen. 3. Henicops, Newp.—Segmentum cephalicum latum; ocellorum pari unico.

Fam. 3. Scolopendridæ, Leach.—Segmenta podophora 21 vel 23. Pedes posteriores incrassati; articulo primo vel secundo spinoso.

- Gen. 4.* Scolopendra, *L.*—Segmentum cephalicum cordatum, imbricatum. Ocellorum paria 4. Spiraculorum valvularium paria 9.
- Gen. 5.* Cormocephalus, *Newp.*—Segmentum cephalicum posticè truncatum. Spiracula valvularia.
- Gen. 6.* Rhombocephalus, *Newp.*—Segmentum cephalicum basilareque rhomboidea. Labium angustatum.
- Gen. 7.* Heterostoma, *Newp.*—Segmentum cephalicum truncatum. Dentes magni. Spiracula cribriformia, in paribus 10.
- Gen. 8.* Scolopendropsis, *Brandt.*—Segmentum cephalicum truncatum. Pedum paria 23.
- Gen. 9.* Theatops, *Newp.*—Ocelli distincti. Antennæ 17-articulatæ, subulatæ. Pedes posteriores clavati. Labium dentatum.
- Gen. 10.* Cryptops, *Leach.*—Ocelli nulli vel absconditi. Antennæ 17-articulatæ. Labium haud denticulatum.
- Fam. 4. Geophilidæ, Leach.*—Segmenta subæqualia, singula e subsegmentis 2 completis sed inæqualibus efformata. Segmentum anale pedibus brevibus styliformibus.
- Subfam. 1. Scolopendrellinæ, Newp.*—Corpus breve, crassum. Antennæ 14—20-articulatæ.
- Gen. 11.* Scolopendrella, *Gervais.*—Pedum paria 10. Antennæ moniliformes, 14—20-articulatæ.
- Subfam. 2. Geophilinæ, Newp.*—Segmenta numerosa. Antennæ 14-articulatæ.
- Gen. 12.* Mecistocephalus, *Newp.*—Segmentum cephalicum angustissimum, elongatum. Corpus attenuatum. Labium latum, integrum.
- Gen. 13.* Arthronomalus, *Newp.*—Segmentum cephalicum subquadratum. Antennarum articuli inæquales. Labium angustum, emarginatum.
- Gen. 14.* Gonibregmatus, *Newp.*—Segmentum cephalicum cordiforme, acutum. Antennæ filiformes. Corpus lineare.
- Gen. 15.* Geophilus, *Leach.*—Caput subtriangulare. Corpus depressum, gradatim incrassatum. Segmenta pedesque numerosi.

Ord. 2. CHILOGNATHA, Latr.—Caput verticale, rotundatum; mandibulæ crassæ, robustæ, vel cum labio coalitæ et elongatæ; segmenta numerosa. Corporis segmenta inæqualia. Pedes superficiei ventrali affixi. Organorum sexualium aperturæ in segmenti 4^{ti} et 7^{mi} superficiei ventrali.

Trib. 3. PENTAZONIA, Brandt.—Corpus ovale, in globum contractile, dorso valdè convexo, ventre complanato. Pedes laminis liberis mobilibus affixi.

Fam. 5. Glomeridæ, Leach.—Corpus læve, in globum contractile. Oculi distincti.

Gen. 16. Glomeris, Latr.—Ocelli 8, in lineâ laterali curvatâ. Segmenta 13. Pedum paria 17.

Gen. 17. Zephronia, Gray.—Ocelli numerosi, aggregati. Antennæ 6—7-articulatæ, clavatæ. Pedum paria 21.

Gen. 18. Sphærotherium, Brandt.—Ocelli aggregati. Antennæ 7-articulatæ, clavatæ. Pedum paria 21.

Trib. 4. MONOZONIA, Brandt.—Corpus vermiforme, elongatum. Segmenti singuli dimidia pars anterior cylindrica, posterior lateribus dilatata; laminâ ventrali duplici coalitâ pedum paria 2 gerenti.

Fam. 6. Polyxenidæ, Newp.—Caput arcuatum, prominens. Corpus latum. Pedes attenuati; coxis maximis. Segmentum anale fasciculis longis.

Gen. 19. Polyxenus, Latr.—Corpus breve, squamis parvis penicillatis vestitum. Pedum paria 13.

Fam. 7. Polydesmidæ, Leach.

Subfam. 1. Polydesminæ, Newp. Oculi nulli vel obscuri.

Gen. 20. Fontaria, Gray.—Corpus convexum. Segmenta imbricata; laminis lateralibus deflexis.

Gen. 21. Polydesmus, Latr.—Corpus depressum, subconvexum; laminis lateralibus horizontalibus.

Gen. 22. Strongylosoma, Brandt.—Corpus cylindricum. Segmenta tumida; laminis lateralibus rotundatis subnullis.

Subfam. 2. Craspedosominæ, Newp. Oculi distincti.

Gen. 23. Craspedosoma, Leach.—Ocelli numerosi, aggregati. Corpus depressum; laminis lateralibus prominentibus.

Gen. 24. Platydesmus, Lucas.—Ocelli duo, magni, prominentes. Corpus depressum; laminis lateralibus prominentibus.

Gen. 25. Cambala, Gray.—Ocelli serie simplici curvatâ. Corpus cylindricum; laminis lateralibus brevissimis, in porcam simplicem desinentibus.

Trib. 5. BIZONIA, Newp.—Corpus subcylindricum; laminis nullis marginalibus. Antennæ 7-articulatæ, clavatæ. Segmenta numerosa; singula e subsegmentis 2 coalitis efformata, pedumque paria 2 gerentia.

Fam. 8. Iulidæ, Leach.—Corpus cylindricum; laminis lateralibus nullis. Segmenta e subsegmentis 2 coalitis efformata.

Subfam. 1. Synpodopetalinæ, Newp. Pedes laminis immobilibus affixi.

Gen. 26. Platops, Newp.—Caput parvum, complanatum vel concavum. Pedes graciles, elongati. Corpus pyramidale, elongatum.

Gen. 27. Iulus, L.—Caput convexum. Corpus cylindricum. Prothoracis latera triangularia. Antennæ elongatæ.

Gen. 28. Unciger, Brandt.—Squama inferior analis mucronata. Corpus cylindricum.

Gen. 29. Spirobolus, Brandt.—Caput convexum. Oculi subtetragoni. Corpus subpyramidale. Prothoracis latera triangularia. Antennæ breves.

Gen. 30. Spiropæus, Brandt.

Gen. 31. Spirocyclistus, Brandt.—Antennæ breves. Oculi elongati, triangulares. Thoracis latera breviora, triangularia.

Gen. 32. Spirostreptus, Brandt.—Antennæ breves, articulis infundibulatis. Oculi transversi. Prothoracis latera elongata vel dilatata.

Subfam. 2. Lysiopetalinæ, Newp. Pedes laminis mobilibus affixi.

Gen. 33. Lysiopetalum, Brandt.—Frons dilatata. Pedes laminis liberis mobilibus affixi.

Fam. 9. Polyzonidæ, Newp. (*Ommatophora*, Brandt).—Ocelli conspicui, fronti inter antennis in seriebus transversis inserti.

Gen. 34. Polyzonium, Brandt.—Ocelli 6 parvi, in seriebus 2 transversis. Corpus depressum.

Gen. 35. Siphonotus, Brandt.—Ocelli 2, in serie simplici transversâ.

Fam. 10. Siphonophoridæ, Newp. (*Typhlogena*, Brandt).—Oculi nulli.

Gen. 36. Siphonophora, Brandt.—Caput conicum, elongatum. Nutritionis organa rostriformia, elongata.

The author then proceeds to treat at considerable length of the external anatomy of the *Myriapoda*, commencing with the composition and mode of development of the segments and their appendages, and comparing them in these particulars with Insects. The variations

in the several genera of *Myriapoda* are particularly noticed; and the principles on which their development, in its various modifications, depends, are elucidated by numerous observations on their mode of growth. The structure and development of the head are next treated of in detail in the different families and genera of the *Chilopoda*; and the organs of nutrition are especially examined with reference to their development and analogies. This branch of the subject is concluded by an appreciation of the relative value of the different parts of the skeleton in furnishing generic and specific characters.

The systematic description of the families, genera and species of the *Myriapoda Chilopoda* completes the memoir; which was accompanied by a series of drawings, illustrative of their external anatomy and generic characters.

May 7.

E. Forster, Esq., V.P., in the Chair.

M. Louis Agassiz, Professor of Natural History at Neufchatel, and Dr. M. J. Schleiden, Professor of Botany in the University of Jena, were elected Foreign Members.

Hugh Falconer, Esq., M.D., and Mr. George Brettingham Sowerby, Jun., were elected Fellows.

Read "Descriptions of the Insects collected by Capt. P. P. King, R.N., F.R.S., F.L.S. &c., in the Survey of the Straits of Magellan." By John Curtis, Esq., F.L.S. &c., in continuation of a paper printed in vol. xviii. of the Transactions of the Society.

The present paper, like the former, is devoted to *Coleoptera*, and the following are the new genera and species characterized in it:—

FAM. HISTERIDÆ.

Hister Mathewsi, violaceo-ater, capite thoracis margine elytrisque punctulatis nisi in elytrorum disco ubi maculæ 2 magnæ violacæ striæque tres basales breves. Long. $1\frac{3}{4}$ lin.; lat. $1\frac{1}{3}$.

Hister furcatus, nitidè virescenti-niger, thoracis lateribus brevi-canaliculatis punctulatis, elytris striâ suturali curvatâ basali tribusque costam versus apicem haud attingentibus. Long. $1\frac{2}{3}$ lin.; lat. $1\frac{1}{2}$.

Hister castaneus, lævis niger, thoracis lateribus punctulatis, elytris pedibusque castaneis; illis striâ suturali furcatâ duabus aliis æquilongis alterâque humerali brevioribus. Long. $1\frac{2}{3}$ lin.; lat. $1\frac{1}{4}$.

Fam. HYDROPHILIDÆ.

Hydrophilus chalybeatus, intense nitidè cæruleus, elytris lineis tribus punctulorum remotorum piliferorum, palpis antennisque ochreis apice nigris, pedibus subcastaneis; femoribus piceis. Long. 6 lin.; lat. 3.

Hydrophilus ochripes, palpis antennis labroque basi ochreis apice nigrescentibus, pedibus thoracis margine inferiore sternoque ferrugineo-ochraceis. Long. 4 lin.; lat. 2½.

Fam. SCARABÆIDÆ.

Sect. COPROPHAGÆ.

Copris semisquamosa, nigra, clypeo magno bidentato cornu brevi emarginato armato, thorace brevi anticè irregulariter truncato, elytris profundè striatis. Long. 10½ lin.; lat. 6.

Copris punctatissima, nigra, clypeo emarginato haud tuberculato, thorace magno punctatissimo tuberculato parvo anticè armato, elytris profundè punctato-striatis. Long. 8 lin.; lat. 4¾.

Sect. GEOTRUPIDÆ vel ARENICOLÆ.

Acanthocerus muricatus, niger, punctulatus, elytris punctato-striatis apice tuberculatis. Long. 1¾ lin.; lat. 1¼.

Sphærosomus muricatus, Kirby MSS.

Sect. TROGIDÆ.

Trox bullatus, niger cinereo mixtus, thorace inæquali: angulis posticis sublobatis, elytris tuberculis minutis conspersis lineisque tuberculorum magnorum tribus parvorumque pluribus notatis. Long. 7½ lin.; lat. 5.

Trox lachrymosus, cinereus nigro mixtus, thorace parvo inæquali, elytris amplis elongato-ovatis punctato-striatis lineis tuberculorum magnorum 4 parvorum 5 notatis. Long. 5—6 lin.; lat. 3—4.

Trox trisulcatus, cinerascens-niger, capite lævi, thoracis sulcis 3 latis longitudinalibus, elytris striatis: intervallis fasciculatis. Long. 2½—3 lin.; lat. 1¾—1½.

Sect. SCARABÆIDÆ vel XYLOPHILÆ.

Oryctomorphus pictus (Waterh.), piceus, clypeo bidentato, fronte tuberculato, thorace impressione centrali, elytrorum areâ scutellum cingente strigâque in singulo obliquâ undulatâ nitidè ferrugineis. Long. 10 lin.; lat. ultra 5.

Sect. PHYLLOPHAGÆ.

Gen. TRIBOSTETHES, Curt.

Palpi iis *Brachystemi* similes, nisi quod maxillares longiores, labiales breves; illorum articulus basalis minutus, 2dus 3tiusque obovato-truncati, hoc brevior, 4tus longus, gracilis, fusiformis, extus sulco longo exaratus. Antennæ 10-articulatæ; articulus basalis crassus, cla-

vatus; 2dus parvus subglobosus; 3tius ellipticus; tres sequentes oblongi; 7mus cuneiformis; reliqui clavam ellipticam capitis longitudine efformantes. Clypeus integer rotundatus, margine paulum elevato, suturâ transversali inconspicuâ. Thorax parvus, transversus; scutellum mediocre, cordatum. Elytra thorace latiora, elliptica. Alæ amplæ. Pectus villosissimus, sterno haud producto; pygidio nudo. Pedes longiusculi, haud crassi; tibiæ anteriores angustæ, extûs tridentatæ, reliquæ setosæ suturis ordinariis; tarsi graciles, articulis omnibus subclavatis; ungue simplici.

Tribostethes castaneus, pallidè castaneus, capite thoraceque virescenti vel æneo tinctis. Long. 8 lin.; lat. 4.

Brachygaster castaneus, Laporte, *Cours Compl. d'Hist. Nat.*

Gen. CALLICHLORIS, Dejean.

Palporum maxillarium articulus penultimus minutus, subglobosus; terminalis crassior, longior, subfusiformis, extûs planus. Antennæ 10-articulatæ; articulus basalis crassus, pyriformis; 2dus subglobosus; 3tius 4tusque oblongi; 5tus brevis; 6tus cyathiformis; 7mus cuneiformis; reliqui clavam gracilem fusiformem efformantes. Labrum transversum, medio paulum angulatum. Clypeus transversè ovalis, medio fortiter reflexo. Femora gracilia: tibiæ anticæ versus apicem angustatæ, extûs tridentatæ; reliquæ subscabræ, apice pectinatæ, calcibusque 2 brevibus armatæ: tarsi anteriores articulis 4 basalibus brevibus, 3tio 4toque cyathiformibus; omnium 5to intûs emarginato; ungue longo, gracili, simplici, anteriore maximè inæquali. Sternum haud productum.

Callichloris perelegans, nitidè flavo-virens punctatissimus, elytris punctato-striatis, subtûs pygidioque ferrugineis anticè pilis albidis villosis posticè pubescentiâ concolori vestitis. Long. 7 lin.; lat. 4.

Leucothyreus? spurius, sine nitore fulvus, capite thoraceque minutè punctulatis: hujus angulis posticis acutis, elytris singulis paribus 4 striarum inconspicuarum notatis. Long. 8½ lin.; lat. 5.

Leucothyreus? antennatus, ochreus, capite castaneo, antennarum clavâ longissimâ. Long. 6 lin.; lat. 3.

Gen. SERIOIDES, Guér. *Camptorhina*, Kirby nec Schönk.

Antennæ 9-articulatæ; articulus basalis crassus, pyriformis; 2dus obovatus; 3tius longior, gracilior; 4tus gracilis haud 2do longior; reliqui clavam gracilem, tenuiter 5-lamellatam, efformantes. Clypeus rotundatus. Labrum emarginatum. Palpi maxillares longi, graciles, 4?-articulati; articulo basali minuto, sequentibus elongatis subæqualibus, terminali truncato: labiales 3-articulati, articulo tertio fusiformi. Caput semiorbiculare. Thorax transversus, basi supra scutellum elongatum emarginatus. Elytra longissima. Pedes longi, graciles: tibiæ anticæ breves, latæ, extûs tridentatæ; reliquæ spinosæ: tarsi similes,

longissimi, graciles, setosi; articulis subæqualibus: ungues omnes simplices, longi, graciles.

Serioides atricapillus, elongatus, violaceo-brunneus, punctulatus, elytris rugosis lineatis. Long. 6 lin.; lat. 3.

Camptorhina atricapilla, Kirby.

Serioides Reichii, Guér. Rev. Zool. 1839, p. 301?

Gen. *ATHLIA*, Erichs.

Palpi maxillares parvi, setosi, 4-articulati; articulo basali minuto, 2do elongato-clavato; 3tio obovato-truncato; 4to longitudine primi subsecuriformi. Antennæ minimæ, 9-articulatæ; articulo basali crasso, clavato; 2do 3tioque obovatis, illo crassiore; 4to brevi; 5to 6toque cyathiformibus; reliquis clavam minutam, lobis crassis cyathiformibus, efformantibus. Clypeus reflexus, anticè paulùm angustatus, utrinque emarginatus. Caput latiusculum. Thorax transversus, convexus, lateribus convexis, basi parùm sinuatus, angulis anticis magis acuminatis: scutellum parvum ovatum. Elytra thorace multò latiora terque longiora, abdomen operientia, posticè latiora rotundata. Alæ amplæ. Pedes longi, haud graciles: tibiæ anteriores profundè emarginatæ tridentatæ; reliquæ setosæ: tarsi longissimi, subtùs pubescentes; anteriores crassiores: ungues omnium bifidi.

Athlia rustica (Erichs.), castaneus, punctulatus, pubescens, elytris singulis striis 4 elevatis, antennis pedibusque pallidè ferrugineis. Long. 6½ lin.; lat. 3.

Gen. *PACUVIA*, Curt.

Palpi labiales minutissimi: maxillares graciles, 4-articulati; articulo basali minuto; 2do 3tioque ovalibus; 4to multò crassiore, parvo, ovato-lanceolato. Antennæ parvæ, 9-articulatæ; articulus basalis crassus, clavatus; 2dus magnus, globosus; tres sequentes minores, subglobosi, 5tus subcyathiformis; 6tus cuneiformis; reliqui clavam ovalem efformantes. Caput trigono-truncatum. Clypeus reflexus, emarginatus. Thorax transversus, subhexagonus, lateribus prominentibus. Scutellum elongato-trigonum. Elytra thorace latiora, terque longiora, elliptica. Alæ amplæ, Pygidium nudum. Pedes longi, extensi: femora anteriora brevissima; postica crassissima: tibiæ anteriores breves, extùs bispinosæ; reliquæ pilosæ, medio spinosæ: tarsi longissimi, subtùs pubescentes; 4 anteriorum articulo 2do 3tioque dilatatis; omnium articulo basali 2do multò breviora, terminali gracillimo: unguibus longis, gracilibus, bifidis.

Pacuvia castanea, ochrea punctulata, capite thoraceque castaneis, elytris singulis striis 4 duplicatis. Long. 4½ lin.; lat. 2½.

Gen. *ACCIA*, Curt.

Palpi nudi: labiales minutissimi; maxillares parvi, 4-articulati; articulo basali minuto; 2do elongato, clavato; 3tio breviori, obovato; 4to

omnium maximo, elliptico-truncato. Antennæ parvæ, 9-articulatæ; articuli 2 basales crassi, 1mo pyriformi, 2do globoso-pyriformi; 3tius gracilis, longus; 4tus ovalis; 5tus 6tusque annuliformes; reliqui clavam tenuem efformantes. Clypeus rotundatus reflexus. Caput mediocre. Thorax transversus, basi sinuatus, margine anteriore excavatus, angulis prominentibus. Scutellum elongato-trigonum. Elytra thorace ferè quater longiora, elliptica, pygidium haud completè operientia. Alæ amplæ. Pedes longi, graciles: femora tibiæque anteriores brevissimæ; hæ latæ, extùs tridentatæ; 4 posteriores spinosæ: tarsi longi, graciles, setosi, haud subtùs pubescentes; articulo basali longitudine 2di: unguibus gracilibus, simplicibus.

Accia lucida, nitidè testacea minutè punctulata, capite ferrugineo, elytris subcupreis striatis. Long. $4\frac{1}{2}$ lin.; lat. 2.

Colporhina bifoveolata, ferruginea æneo tincta punctulata, squamis albidis in thorace elytris que maculas efformantibus vestita. Long. 3 lin.; lat. $1\frac{2}{3}$.

Macroductylus marmoratus, subcastaneus pilis albidis vestitus, thoracis disco brunneo lineâ pilorum albidorum centrali, elytris fasciis irregularibus brunneis pubescentiæque albidæ maculis notatis. Long. $3\frac{1}{4}$ lin.; lat. $1\frac{1}{2}$.

Fam. LUCANIDÆ.

Dorcas rufifemoralis, cinereo-niger, capite thoraceque nitidis, elytris densè profundèque punctulatis: punctis ochreo-papillatis, coxis femoribusque rufis. Long. ♂ 10, ♀ $7\frac{1}{2}$ lin.; lat. ♂ $3\frac{1}{2}$, ♀ 3.

Dorcas rufifemoralis, Guér.?

HETEROMERA.

MELASOMA.

Fam. PIMELIARIDÆ.

Procris lævicosta, obscurè æneo-nigra, elytrorum margine inferiore haud punctulato, tarsis subferrugineis. Long. $4\frac{1}{4}$ lin.; lat. $2\frac{3}{4}$.

Fam. BLAPSIDÆ.

Scotobius bullatus, obscurè niger rugosus latus brevis, capite thoraceque punctatissimis: hujus angulis posticis acutis, elytris punctato-striatis: porcis in intervallis nitidis granulatis ad apicem tubercula distincta efformantibus: seriebus 2 costalibus remotè tuberculatis. Long. $6\frac{1}{2}$ lin.; lat. $3\frac{1}{3}$.

Leptynoderus tuberculatus, lutosus, capite trituberculato, thorace tuberculato, elytris porcis 5 acutis e quibus 2 dorsalibus fortioribus. Long. ferè 6 lin.; lat. $2\frac{1}{2}$.

Emalodera multipunctata, nitidè nigra punctatissima, thorace obovato-truncato, elytrorum punctis lineas numerosas duplicatas efformantibus margine extùs apiceque tuberculatis. Long. $5\frac{1}{2}$ — $6\frac{1}{2}$ lin.; lat. 3— $3\frac{1}{4}$.

Nyctelia caudata, nitidè atra, elytris (nisi in areâ suturali) obliquè cras-

sèque sulcatis : apice in caudam semicircularem dilatatis. Long. $8\frac{1}{2}$ —13 lin. ; lat. 5— $7\frac{1}{2}$.

Nyctelia undulapennis, lævis nigra, elytris sulcis 7 brevibus latis transversis in margine exteriori. Long. 8 lin. ; lat. ♂ $4\frac{1}{2}$, ♀ $5\frac{1}{2}$.

Nyctelia Fitzroyi, lævis nigra, elytris hemisphæricis caudatis, antennarum pedibusque nitidè ferrugineis. Long. 10 lin. ; lat. $7\frac{1}{2}$.

Nyctelia granulata, lævis nigra, elytris latissimis ovatis orbicularibusve rugosissimis : rugis suturam versus lineas longitudinales efformantibus. Long. ♂ 8 lin., ♀ 9 ; lat. $4\frac{1}{2}$ —6.

Nyctelia Bremii, nitidè nigra, elytris suborbicularibus caudatis lineis elevatis suturam versus obliquis ad marginem exteriorem curvatis profundè insculptis. Long. 9 lin. ; lat. $5\frac{1}{2}$.

Nyctelia Bremii, *Waterh. in Ann. and Mag. Nat. Hist.* vol. xiii. p. 48.

Nyctelia? corrugata, nitidè nigra, thoracis lateribus rugosis, elytris transversim undulato-canaliculatis : suturâ depressâ bistriatâ. Long. $8\frac{1}{2}$ lin. ; lat. 5.

Mitragenus araneiformis, niger, thorace subtilissimè vermiculato prope basin angulato, elytris cinereis cupreo tinctis subscabris nigro-maculatis : singulis porcis 2 ante apicem coalitis. Long. $8\frac{1}{4}$ —9 lin. ; lat. $4\frac{1}{2}$ — $5\frac{1}{2}$.

Epipedonota margineplicata, nigra nitida, thorace concavo in disco longitudinaliter in marginibus transversè striato, elytris porcis 2 exteriore fortiore : intervallo hanc inter marginemque exteriorem regulariter transversè canaliculato. Long. 11 lin. ; lat. 6.

Nycterinus rugiceps, obscurè niger, capite punctulato ad basin granulato, thorace lævi, elytris punctato-striatis. Long. 8 lin. ; lat. 3.

TAXICORNES.

Fam. DIAPERIDÆ.

Oplocephala quadrituberculata, piceo-nitida, trophis antennarum pedibus subtusque ferrugineis, capite 4-tuberculato. Long. $3\frac{1}{4}$ lin. ; lat. $1\frac{1}{2}$.

Alphitobius? punctatus, ellipticus subconvexus, virescenti-niger, punctatissimus, elytris piceo-brunneis striato-punctatis, trophis antennarum pedibusque castaneis. Long. 2. lin. ; lat. 1.

Epilasion rotundatum (Dej.), ovale, nigrum, punctatissimum, pube pallidè brunneâ vestitum, elytris punctato-striatis. Long. 4 lin. ; lat. $2\frac{3}{4}$.

Fam. TENEBRIONIDÆ.

Epitragus æneo-brunneus, ferrugineus æneo-tinctus, undiquè punctatus, capite punctatissimo, elytris minutè striato-punctatis. Long. lin. 4 ; lat. $1\frac{3}{4}$.

Epitragus semicastaneus, castaneus, minutè punctatissimus, capite thoraceque piceis, elytris inconspicuè punctato-striatis. Long. $3\frac{1}{2}$ lin. ; lat. $1\frac{3}{4}$.

Fam. HELOPIDÆ.

Prostenus? hirsutus, nitidè æneus vel cupreus, pilis longis vestitus, punc-

tulatus, antennis nigris, elytris subcastaneis punctato-striatis, femoribus basi rufis. Long. $2\frac{1}{2}$ lin.; lat. $1\frac{1}{3}$.

Fam. MORDELLIDÆ.

Mordella Tachyporiformis, nigra minutè et crebrè punctulata, suprâ pube brevi brunneâ vestita. Long. 3 lin.; lat. ultra 1.

Mordella argentipunctata, sericeo-nigra, thoracis margine antico elytrorumque basali maculis 4 aculeisque basalibus argenteo-albis. Long. ferè 2 lin.; lat. $\frac{3}{4}$.

Fam. CANTHARIDÆ.

Epicauta conspersa (Germ. ?), nigra pube cinereâ, punctis nigris minutis sparsim conspersa. Long. 5 lin.; lat. 2.

Tetraonyx 7-guttatus, niger suprâ aurantiacus, capitis thoracisque maculâ elytrorum maculis 4 basalibus fasciâque postmedianâ irregulari nigris, femoribus basi rufis. Long. $5\frac{1}{2}$ lin.; lat. $2\frac{1}{4}$.

Tetraonyx cinctus, nitidè niger pubescens punctulatus, elytris subscabris suturâ margineque exteriore ochraceis. Long. 4 lin.; lat. $1\frac{1}{2}$.

Fam. CÆDENERIDÆ.

Nacerdes? alternans, pallidè ochreus, oculis thoracis lineâ inconspicuâ elytrorumque strigis 2 longis pallidè fuscis. Long. $3\frac{1}{4}$ lin.; lat. 1.

The paper was accompanied by drawings of many of the new species.

Anniversary Meeting.

May 24.

The Lord Bishop of Norwich, President, in the Chair.

The President opened the business of the Meeting, and the number of Members whom the Society had lost during the past year having been stated, the Secretary proceeded to read the following notices of some among them.

The deaths among the Fellows have amounted to eight. Among these the first name is that of

William Allen, Esq., a gentleman more distinguished by his investigations in experimental philosophy than by the pursuit of natural history, and still more by that active and unwearied benevolence which has identified his name with almost every recent effort for the amelioration of the condition of mankind. Of such a man we cannot

but feel a pleasure in recording that he was for forty-two years a Fellow of this Society, and that, however occupied in other pursuits, he never ceased to take a warm interest in botanical investigations.

His business being that of a chemist, Mr. Allen's attention was naturally directed to that science; and in conjunction with Mr. Pepys he published several valuable chemical papers in the 'Philosophical Transactions' of the Royal Society, of which he became a Fellow in 1807. The first of these, "On the quantity of Carbon in Carbonic Acid and on the Nature of the Diamond," was published in 1807; and was succeeded in 1808 and 1809 by two papers "On the changes produced in Atmospheric Air and Oxygen Gas by Respiration," and in 1829 by another "On the Respiration of Birds,"—subjects which he and his friend Mr. Pepys illustrated by a series of the most delicate experiments.

The only paper contributed by Mr. Allen to our own Transactions was read in May 1805, and contains an account of some experiments made by him on a substance called *Dapêche*, sent to Sir Joseph Banks from South America by M. de Humboldt, which, although very different in external appearance, he determined by analysis to be a mere modification of Caoutchouc.

Mr. Allen was for several years a very popular Lecturer on Experimental Philosophy at the Royal Institution; and for more than twenty years (viz. from 1804 to 1827) he filled the office of Lecturer on the same subject at Guy's Hospital. In 1807, cooperating with the late Mr. Joseph Fox, he first directed his energies to assist in the struggle which Joseph Lancaster was then making to establish his system of mutual instruction; and from this period, his time and attention were by degrees almost wholly devoted to that great undertaking. His death occurred in the 74th year of his age, at Lindfield in Sussex, where he had resided for many years for nearly half his time, occupied in the superintendence of some important experiments for the promotion of an improved condition of the working classes in agriculture by means of education and allotments of land, on which subject he published several interesting essays.

Richard Forester Forester, Esq., M.D., President of the Derby Philosophical Society, and for five-and-forty years a Fellow of the Linnean Society, died on the 5th of December last, in the 73rd year of his age. He was at the head of his profession in the town of Derby, and took a leading part in most of the useful and benevolent institutions of his neighbourhood; being also the senior magistrate of the county, and an alderman and a magistrate of the borough. He was distinguished for classical attainments and a refined taste; and

had formed a collection of fossils which he bequeathed to the Museum of the Derby Society. To the Arboretum so nobly presented to the town by the late Mr. Joseph Strutt (and the formation of which is regarded as one of the most successful labours of another of our Fellows, whom it will be my duty presently to notice more particularly), Dr. Forester bequeathed the sum of 300*l.*, besides several considerable legacies to charitable institutions.

James Barlow Hoy, Esq., who for several years represented the borough of Southampton in Parliament, was much attached to ornithology, and at the time of his melancholy death was on a tour in the Pyrenees, with the object of collecting rare birds. His death, which took place on the 13th of August last, at the Hospice de Vieille, was occasioned by the bursting of his gun while engaged in his favourite pursuit.

John Claudius Loudon, Esq., was born at Cambuslang, in the county of Lanark, on the 8th of April 1783. He was the eldest son of a respectable farmer in the neighbourhood of Edinburgh; and his mother being left a widow with a large family, his exertions were early called forth to assist in providing for their support. At the age of twenty he came to England, and began to practise as a landscape gardener, the profession for which he had been educated, and which he afterwards cultivated with so much success. In 1806 he became a Fellow of the Linnean Society, and in 1809 resided in Oxfordshire, where he had taken an extensive farm. He subsequently made several tours on the continent, visiting Sweden, Russia, Poland and Austria in 1813, 1814 and 1815, Italy in 1819, and France and Germany in 1828. During the latter years of his life he resided at Bayswater, in the neighbourhood of London.

Soon after his first arrival in England he was visited by a severe attack of inflammatory rheumatism, which disabled him for two years and terminated in an anchylosed knee and a contracted left arm. During a subsequent attack in 1820 his right arm was broken in the operation of shampooing, and not having properly united was again broken in 1825, when its amputation became necessary. At the same time the thumb and two of the fingers of his left hand were rendered useless. He afterwards suffered frequently from attacks of illness, and died on the 14th of December 1843, of the effects of severe and long-continued disease of the lungs.

Such were the adverse circumstances under which Mr. Loudon commenced and pursued a career of literary labour of no ordinary extent, of much variety of subject, and requiring intense severity of application. His first essay was published in 1803, and for forty

years he continued almost without intermission the publication of a series of works, original and compiled, chiefly devoted to agriculture, horticulture and rural architecture, and of a highly useful and practical character. The number and magnitude of these works, the incessant labour required in their production, and the anxieties necessarily attendant on the large outlay of money involved in them, were sufficient to undermine a constitution of far greater strength; but his energy and enthusiasm supported him through every difficulty, and did not desert him even on his death-bed. He has left a widow and one child, a daughter; the former well known by various publications, and especially by her 'Ladies' Flower-Garden' and 'Ladies' Botany.'

The following is a list of Mr. Loudon's principal works:—

1. Observations on Laying out Public Squares. 1803.
2. Observations on Plantations. 1804.
3. A Treatise on Hothouses. 4to, 1805.
4. A Treatise on forming and managing Country Residences. 2 vols. 4to, 1806.
5. An Account of the Paper Roofs used at Tew Lodge, Oxon. 8vo, 1811.
6. Designs for Laying out Farms and Farm-buildings in the Scotch style; adapted to England. 4to, 1811.
7. Remarks on the Construction of Hothouses. 4to, 1817.
8. Sketches of Curvilinear Hothouses. 4to, 1818.
9. An Encyclopædia of Gardening. 8vo, 1822. Ed. 2, 1825.
10. The Greenhouse Companion.
11. Observations on Laying out Farms. Fol.
12. An Encyclopædia of Agriculture. 8vo, 1825. Ed. 2, 1831.
Supplement to ditto. 1834.
13. The Gardener's Magazine, commenced in 1826, and continued to the day of his death.
14. The Magazine of Natural History, commenced in 1828, carried on for many years, and now incorporated with Taylor's 'Annals.'
15. The Encyclopædia of Plants. 8vo, 1829.
First Additional Supplement to ditto. 1840.
16. A Manual of Cottage Gardening and Husbandry. 8vo, 1830.
17. Illustrations of Landscape-Gardening and Garden Architecture, in Eng., French and German. Fol. 1830–31.
18. Hortus Britannicus. 8vo, 1830.
Supplement to ditto. 1832.
Second Additional Supplement (prepared by W. H. Baxter). 1839.

19. The Encyclopædia of Cottage, Farm, and Villa Architecture and Furniture. 4to, 1833.

First Additional Supplement to ditto.

20. Arboretum et Fruticetum Britannicum. 8 vols. 8vo. Completed in 1838.

21. The Architectural Magazine, commenced in 1834.

22. The Suburban Gardener and Villa Companion. 8vo, 1838.

23. Hortus Lignosus Londinensis. 1838.

24. A new edition of Repton's Landscape-Gardening. 1839.

25. An Encyclopædia of Trees and Shrubs; abridged from the Arboretum et Fruticetum Britannicum. 8vo, 1842.

26. The Suburban Horticulturist. 8vo, 1842.

27. On Cemeteries. 1843.

He was also Editor of the 'Gardener's Gazette' in 1840 and 1841; and contributed various articles to the 'Encyclopædia Britannica,' and to Brande's 'Dictionary of Science.'

James Macartney, Esq., M.D., F.R.S. &c., was born in Armagh in March 1770, and was educated in the country. He was not originally destined for any profession; but in 1794 he apprenticed himself to Dr. Hartigan, then Professor of Anatomy to the Royal College of Surgeons in Ireland. In 1798 he removed to London, where he became Demonstrator of Anatomy in St. Bartholomew's Hospital; and two years afterwards commenced lecturing on Comparative Anatomy and Physiology. This course, of which he published a Prospectus in 1806, was continued until 1810. In the following year he was elected a Fellow of the Royal Society; and having returned to Ireland was in 1813, on the death of his former teacher Dr. Hartigan, elected Professor of Anatomy and Surgery in Trinity College, Dublin, which office he filled for four-and-twenty years. He died of apoplexy on the 6th of March 1843.

Both as a comparative anatomist and an improver of the practice of surgery, Dr. Macartney is entitled to honourable mention. The more important of his contributions to Comparative Anatomy were published in Rees's 'Cyclopædia,' in which the principal articles on that subject were written by him. To the 'Philosophical Transactions' he contributed some valuable "Observations upon Luminous Animals," published in the volume for 1810, and "An Account of an Appendix to the small Intestines of Birds," in that for 1811. A memoir "On the Anatomy of the Brain of the Chimpanzee" appeared soon after his death in the 'Transactions of the Royal Irish Academy,' of which he had long been an active Member, and to whose Transactions he had previously contributed an essay "On the

Curvatures of the Spine." He also made several minor communications to the British Association for the Advancement of Science, and to the Académie de Médecine of Paris, of which he was a Foreign Member. Of the Linnean Society he became a Fellow in 1814, but he has no paper in our Transactions.

As a lecturer it is stated of him, that "though his manner was unadorned by the arts of verbal eloquence, he became highly popular from the ideas which he imparted, and the distinct and logical language in which they were clothed: his classes were always very large, and by his means the reputation of the Medical School of the University of Dublin was materially elevated." His introductory Lecture to the Anatomical Course of 1824 was published in 1826; and the substance of his Lectures on Inflammation, the most important and original part of his Surgical Course, are given in his 'Treatise on Inflammation,' published the year after he resigned his Professorship. This volume contains an exposition of his views on the proximate cause of inflammation, and of his mode of administering steam fomentations and applying water dressings, now so universally and beneficially adopted in surgical practice.

Charles Saville Onley, Esq.

Simon Stephenson, Esq.

George William Wood, Esq., was the eldest son of the Rev. William Wood of Leeds, an early Fellow of the Society, and the intimate friend of our founder and first President. He was born in 1781, and became connected at an early age with one of the largest establishments in Manchester, of which he continued to be a partner until its dissolution, when he retired from business with a handsome fortune. At the general election for 1832 he was returned to Parliament for the Southern Division of the county of Lancaster, and in 1837 for the borough of Kendal, which he continued to represent till his death. Although endowed with an hereditary fondness for botany and with a strong attachment to geology, the active pursuits of business and the conscientious discharge of his public duties left him little leisure for their cultivation; but he was ever ready to promote the views of those who were more actively engaged in the prosecution of science, and to render them such services as his position enabled him to perform. Of this disposition we have a striking proof in the Bill introduced by him and carried through Parliament in the course of the last Session, the effect of which is to exempt scientific societies from local taxation; a bill for which we have ourselves reason to feel grateful, as relieving our funds from a burthen of some importance. The circumstances of his death may also be re-

ferred to as connected with his attachment to science ; it occurred suddenly in the rooms of the Literary and Philosophical Society of Manchester, of which he was one of the Vice-Presidents. While engaged in an animated conversation on the progress of the Ordnance Survey, his breathing was observed to become difficult, and the moment after he was found to be dead.

Among our *Foreign Members* we have to commemorate

Don José Pavon, a botanist of considerable merit, and the colleague of Ruiz in the memorable botanical expedition dispatched to Peru by the Spanish Government in the year 1777, from which were obtained such important results both in collections and publications. On the recommendation of Ortega, then Professor of Botany at Madrid, the expedition was placed under the direction of Ruiz, who was accompanied by Pavon and by two artists, Brunete and Galvez. M. Dombey also, who had been dispatched from France on a similar mission, was allowed to accompany them ; and during a residence of ten years they visited many of the most interesting districts of Peru and Chile. In 1788 Ruiz and Pavon returned to Europe, bringing with them large collections of plants and an extensive series of botanical drawings, and leaving behind them two of their pupils, Tafalla (afterwards Professor of Botany in the University of Lima), and Pulgar (an artist of merit), to continue their investigations. The collections thus made by themselves, and those which were subsequently transmitted to them, formed the basis of a series of works on the botany of the Western Regions of South America, which, had they been carried on to completion, would have been indeed a magnificent contribution to science, and which even in their present incomplete state are of high importance. The first of these publications appeared in 1794, under the title of '*Floræ Peruvianæ et Chilensis Prodrromus*,' and contains descriptive characters and illustrative figures of their new genera. This was followed in 1798 by the first volume of the '*Flora Peruviana et Chilensis*,' two other volumes of which, extending as far as the class *Octandria* of the Linnean system, were published in 1799 and 1802. The plates of a fourth volume, as well as many others intended for subsequent publication, were also prepared. In 1798 also was published the first volume of a smaller work without figures, entitled '*Systema Vegetabilium Floræ Peruvianæ et Chilensis*,' containing characters of all their new genera and of the species belonging to them, as well as of all the other species described in the first volume of their '*Flora*.'

Of the immense collections made by Ruiz and Pavon and other

botanists in the Spanish possessions in America, a large portion was purchased by Mr. Lambert between the years 1817 and 1824. These were dispersed at the sale of his herbarium in 1842; but a part of them was then obtained for the British Museum, where they are now deposited. Little is known of the latter years of Pavon; his correspondence with Mr. Lambert appears to have ceased in 1824, and even the exact date of his death has not been ascertained.

The President also announced that 19 Fellows, 2 Foreign Members, and 1 Associate had been elected since the last Anniversary.

At the election which subsequently took place, the Lord Bishop of Norwich was re-elected President; Edward Forster, Esq., Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out: viz. Francis Boott, M.D.; Edward Forbes, Esq., Professor of Botany in King's College, London; the Rev. William Hincks; Daniel Sharpe, Esq.; and William Spence, Esq.

June 4.

The Lord Bishop of Norwich, President, in the Chair.

Sir Edward Ffrench Bromhead, Bart., Arthur Henfrey, Esq., and Jephson Potter, Esq., M.D., were elected Fellows.

Read a continuation of Mr. Griffith's memoir, being the portion relating to *Sarcophyte*.

Read also the conclusion of Mr. Woods's "Attempt to arrange the *Carices* of Middle Europe."

In this paper Mr. Woods passes in review the principal characters by means of which the species of *Carices* may be arranged into groups, and adopts with some modifications the system of Koch. His arrangement is as follows:—

A. Spicâ unicâ simplicî.

1. Diœcæ; stigmatibus 2.

1. *C. dioica*; 2. *C. Davalliana*.

2. Monœcæ; stigmatibus 2.

3. *C. pulicaris*; 4. *C. decipiens*; 5. *C. capitata*.—6. *C. Suteri*, which

may belong to the following division, as the number of stigmas is not indicated.

3. Monœcæ; stigmatibus 3.

7. *C. microglochis*; 8. *C. pauciflora*; 9. *C. Pyrenaica*; 10. *C. spicata*,
11. *C. rupestris*.

B. Spicis capitatis involucretis.

12. *C. cyperoides*; 13. *C. Baldensis*.

C. Spicis compositis.

1. Stigmatibus 3.

14. *C. curvula*.

2. Stigmatibus 2; floribus sterilibus in spicarum apice.

15. *C. fœtida*; 16. *C. stenophylla*; 17. *C. lobata*; 18. *C. incurva*; 19.
C. schœnoïdes; 20. *C. divisa*; 21. *C. chordorhiza*; 22. *C. vulpina*;
23. *C. muricata*; 24. *C. divulsa*; 25. *C. teretiuscula*; 26. *C. para-*
doxa; 27. *C. paniculata*.

3. Stigmatibus 2; spicis aliis fertilibus aliis sterilibus, v. floribus sterilibus in mediâ spicâ, v. floribus sterilibus in aliis spiculis basalibus in aliis apicalibus.

28. *C. ludibunda*; 29. *C. intermedia*; 30. *C. modesta*; 31. *C. arenaria*;
32. *C. repens*; 33. *C. microstyla*.

4. Stigmatibus 2; floribus sterilibus in spicarum basi.

34. *C. brizoides*; 35. *C. Schreberi*; 36. *C. Ligerica*, Gay; 37. *C. stellu-*
lata; 38. *C. grypos*; 39. *C. ovalis*; 40. *C. axillaris*; 41. *C. Bæn-*
ninghausiana; 42. *C. remota*; 43. *C. elongata*; 44. *C. lagopina*;
45. *C. heleonastes*; 46. *C. curta*; 47. *C. loliacea*.

D. Spicis distinctis, omnibus androgynis; floribus sterilibus in apice spicarum; stigmatibus 3.

48. *C. Linkii*; 49. *C. Sarda*.

E. Spicis lateralibus ♀; terminali androgynâ, floribus sterilibus apicalibus; stigmatibus (nisi in *C. bicolor*) 3; fructu inconspicuè rostrato.

50. *C. bicolor*; 51. *C. atrata*; 52. *C. aterrima*; 53. *C. nigra*; 54. *C.*
Vahlîi; 55. *C. Buxbaumii*.

F. Spicis distinctis; stigmatibus 2.

1. Fructûs rostro complanato marginato.

56. *C. mucronata*; 57. *C. microstachya*.

2. Fructûs rostro parvo teretiusculo plerumque membranaceo.

58. *C. Grahami*; 59. *C. saxatilis*; 60. *C. Goodenovii*; 61. *C. rigida*;
62. *C. cœspitosa*; 63. *C. trinervis*; 64. *C. aquatilis*; 65. *C. acuta*;
66. *C. Mœnchiana*.

G. Spicâ masculâ unicâ, fœmineâ unicâ vel pluribus; stigmatibus 3.

1. Spicis plerisque vel omnibus in apice culmi approximatis subsessilibus; fructûs rostro haud complanato vel bifido.

67. *C. supina*; 68. *C. platystachya*; 69. *C. macrolepis*; 70. *C. gyno-*

- basis; 71. *C. Griolctti*; 72. *C. tomentosa*; 73. *C. præcox*; 74. *C. mollis*; 75. *C. reflexa*; 76. *C. umbrosa*; 77. *C. pilulifera*; 78. *C. montana*; 79. *C. ericetorum*.
2. Spicis plerisque vel omnibus in apice culmi approximatis subcorymbosis, fœmineis pedunculatis masculæ subæqualibus; fructu glabro, rostro parvo membranaceo vel nullo.
80. *C. rariflora*; 81. *C. limosa*; 82. *C. irrigua*; 83. *C. pallescens*; 84. *C. ustulata*; 85. *C. capillaris*; 86. *C. nitida*; 87. *C. alba*.
3. Characteres ut in G. 2; sed fructu pubescente.
88. *C. digitata*; 89. *C. ornithopoda*.
4. Spicis cylindricis densissimis corymbosis; fructûs rostro robusto profundè bifido.
90. *C. pseudo-cyperus*.
5. Spicis in apice culmi racemosis, summâ sessili, reliquis exsertè pedunculatis; fructûs rostro bidentato margine scabro.
91. *C. fuliginosa*; 92. *C. frigida*.
6. Spicis plerisque in apice culmi sessilibus, vel inclusè breviter pedunculatis; fructu nisi in margine glabro, rostro complanato bifido.
93. *C. extensa*; 94. *C. flava*; 95. *C. Mairii*; 96. *C. Æderi*.
7. Spicis racemosis per culmi longitudinem descendentibus, superioribus sessilibus vel breviter inclusè pedunculatis, inferioribus subexsertè pedunculatis; fructûs rostro complanato bidentato.
97. *C. Hostiana*; 98. *C. fulva*; 99. *C. Hornschuchiana*; 100. *C. binervis*; 101. *C. lævigata*; 102. *C. distans*; 103. *C. punctata*; 104. *C. Michellii*; 105. *C. brevicollis*; 106. *C. depauperata*; 107. *C. sylvatica*; 108. *C. tenuis*.
8. Characteres ut in G. 7; sed fructûs rostro incerto.
109. *C. ferruginea*; 110. *C. geniculata*; 111. *C. brevifolia*; 112. *C. spadicea*; 113. *C. sempervirens*; 114. *C. firma*; 115. *C. refracta*; 116. *C. fimbriata*.
9. Spicis racemosis; fructu pubescente.
117. *C. clandestina*.
10. Spicis laxè racemosis; fructûs rostro teretiusculo brevi, vel membranaceo v. nullo.
118. *C. panicea*; 119. *C. vaginata*; 120. *C. pilosa*; 121. *C. strigosa*.
11. Spicis longis densis pendulis.
122. *C. pendula*; 123. *C. microcarpa*.
- H. Spicis masculis pluribus; stigmatibus 3.
1. Fructu vix rostrato, aliquando supernè scabro sed haud undique pubescente.
124. *C. glauca*; 125. *C. claviformis*; 126. *C. Genuensis*; 127. *C. lasiochlœna*; 128. *C. lanceolata*; 129. *C. acuminata*; 130. *C. longiaristata*; 131. *C. hispida*.

2. Fructu pilosissimo ; rostro bifido.

132. *C. filiformis* ; 133. *C. evoluta* ; 134. *C. hirta*.

3. Fructu haud piloso ; rostro bifido.

135. *C. secalina* ; 136. *C. hordeiformis* ; 137. *C. vesicaria* ; 138. *C. ampullacea* ; 139. *C. riparia* ; 140. *C. Soleirolii* ; 141. *C. nutans* ;
142. *C. paludosa*.

On many of these species, and on other named species which Mr. Woods regards merely as varieties of one or other of the foregoing, the paper contains numerous observations. Of the following species the descriptions are not sufficiently complete to allow of the author placing them : *C. alopecurus*, Lap. ; *C. juncoides*, Presl ; *C. costata*, Presl ; *C. furcata*, Lap. ; *C. manostachys*, Spr. ; *C. fusca*, All. ; *C. nesliaca*, Suter ; *C. Bastardiana*, DeC. ; and *C. badia*, Pers.

June 18.

The Lord Bishop of Norwich, President, in the Chair.

John Hutton Balfour, Esq., M.D., Regius Professor of Botany in the University of Glasgow, was elected a Fellow.

Read a notice "On the Economy of the Order *Strepsiptera*." By John Curtis, Esq., F.L.S. &c.

Read also a memoir "On the Muscles which move the Tail and Tail-coverts of the Peacock." By G. C. Heming, Esq., M.D., F.L.S. &c.

Dr. Heming first refers to the mechanism by which the elevation of the feathers of birds in general is effected, either by a contractile power of the *cutis vera*, or by various modifications of subcutaneous muscles analogous to the *panniculus carnosus* of certain *Mammalia* ; and then proceeds to the more immediate subject of his paper, the motions of the tail and train of the peacock, in which the apparatus for this purpose is far more complicated than in any other bird. This apparatus consists of two parts ; the one intended for raising the caudal vertebræ and the feathers inserted into the groove of the last vertebra, and the other confined to the movements of the upper tail-coverts. As regards the former, Dr. Heming adopts, with little mo-

dification, the description of the muscles of the tails of birds given by Cuvier ; the latter he describes in the following terms :—

“ Upon the *sacro-coccygeal* muscle, which is exceedingly large and powerful in this bird, there is placed a mass of cellular substance somewhat of a triangular shape, measuring about five inches at the base, and each lateral line extending from the base to the apex about six inches ; the base is situated towards the tail, and extends in this direction almost as far as the last caudal vertebra ; thus there is not the space of an inch between the quills of the upper tail-covert and those of the true tail, while the apex of the triangular mass extends nearly to the lumbar extremity of the sacrum ; it is wider than the muscle upon which it lies, and extends over it at each side full half an inch. This triangular mass is much thicker below than above : here it is full three-quarters of an inch thick, whilst at the apex it is not half this thickness. It is covered on its sacral surface by a thin fascia, and is connected to the muscle beneath it by loose cellular texture, which can be easily broken down by the handle of a scalpel ; but it has a membranous and closer connection, and towards its base it is more intimately attached by muscular fibres proceeding from the elevator muscles beneath, which are lost in the fascia covering its sacral surface.

“ The quills of the upper tail-covert are inserted obliquely into this triangular mass of cellular substance, each quill having its peculiar capsule, which seems to be formed of condensed cellular membrane : between each quill there are small muscles, the fibres of which run in parallel lines extending from one quill to the other ; and besides these muscles there are other small ones, the fibres of which run obliquely in such a direction as somewhat to resemble the letter V ; the interstices of these muscles are filled with cellular substance.

“ By the powerful action of the *sacro-coccygeal* and the *sacro-supracaudal* muscles, the true tail is elevated, and at the same time the upper tail-covert is raised perpendicularly and supported by the proper tail, and perhaps the swelling of these muscles in their contraction exerts some influence in spreading the feathers of the upper tail-covert. The principal agents in this office are the small muscles situated between each quill, by the contraction of which the quills are brought closer together, and consequently the opposite ends of the feathers are proportionately separated from each other. The small muscles of which the fibres diverge have not only the power of contributing, by their contraction, to the spreading of the feathers of the upper tail-covert, but they exert considerable influence in raising the feathers perpendicularly. There can be no doubt also,

that the slips of muscular fibres coming from the *sacro-coccygeal* and *sacro-supracaudal* muscles exert their influence in the same office.

“ Although these small muscles are very powerful, they would be quite inadequate, alone, to the office of raising perpendicularly, spreading the feathers and maintaining them for any considerable time, were it not that the feathers of the upper tail-covert are partly raised and maintained in this position by the elevation of the true tail.”

The paper was accompanied by coloured drawings, representing in detail the muscular apparatus in the tail of the Peacock.

Read also a memoir “ On the Solid Vegetable Oils.” By Edward Solly, Jun., Esq., F.R.S., F.L.S. &c.

Mr. Solly commences his paper by referring to the usual division of oils into three classes, the fat, the drying and the volatile. The fat oils vary in their properties according to the relative proportions which they contain of Elaine or fluid oil and of Stearine or solid oil; those which contain much of the former being fluid at ordinary temperatures, while those which contain a larger quantity of stearine are solid under ordinary circumstances and constitute the class of Tallows or Butters. Of these the vegetable kingdom affords a very considerable number; and Mr. Solly having recently received specimens of several, has collected in the present paper a large amount of information concerning them, to which he has added his own observations. He arranges the Vegetable Butters or Tallows according to the botanical affinities of the plants by which they are produced, and enumerates the principal among them as follows:—

1. *Theobroma Cacao*, L., and several other species of *Theobroma*.
2. *Vateria Indica*, L.

This tree (the Tallow-tree of Canara) is remarkable for producing at the same time an excellent resin resembling copal and a solid fat or tallow, suitable for the manufacture of candles. Mr. Solly has examined several specimens of the oil, which all agree in general characters with Dr. Babington's description, published in 1825, but differ in some minor points. The peculiar fracture described by him does not always appear, and is probably modified by the rate of cooling and other circumstances.

3. *Pentadesma butyracea*, G. Don.
4. *Carapa Touloucouna*, Guill. and Perrott.
5. ——— *Guianensis*, Aubl.
6. *Stillingia sebifera*, Mich.

For seeds of the *Stillingia* and specimens of the tallow prepared

from it, Mr. Solly is indebted to W. V. Hillyer, Esq., who received them from Mr. Lay, Her Majesty's Consul General in China. The tallow is pure white, has little or no smell, is harder than common tallow, melts at 100°, and consists of 70 parts of solid and 30 of fluid oil. Mr. Solly has found the seeds to contain two oils; one a tallow resembling that just described, which is contained in the white cellular envelope of the seed; the other a colourless or pale yellow oil, which exists in the kernel and is readily obtained by expression. This oil is fluid at all common temperatures, and it is evident that the properties of the tallow will vary greatly according as only one or both of these oils may be expressed.

7. *Bassia butyracea*, Roxb.

Of the Choree Butter, the produce of this tree, Mr. Solly has examined two specimens, the first presented to the Royal Asiatic Society by Sir R. Colquhoun in 1826, and the second brought over by Mr. Traill in 1834. Both samples were of a pure white colour and of the consistence of tallow, the older being rather harder and having a disagreeable rancid smell, while that brought over by Mr. Traill is at the end of ten years perfectly sweet and free from rancidity. The former contained 82 parts of stearine and 18 of elaine; the latter 60 parts of stearine, 34 of elaine, and 6 of vegetable impurities. Both were easily saponifiable, forming beautiful white soaps.

8. *Bassia longifolia*, L.

9. — *latifolia*, Roxb.

10. — ?? *Parkii*, G. Don.

Mr. Solly has examined a specimen of the butter of this tree presented by Dr. Stanger to Mr. Ward. It is of a white colour having a slight tinge of gray, and has hardly any taste or smell. Its consistence is nearly that of common butter; it melts at 97° of Fahrenheit, and consists of 56 parts of solid and 44 of fluid oil.

11. *Laurus nobilis*, L., and other species of *Laurus*.

12. *Tetranthera sebifera*, Nees.

13. *Cinnamomum Zeylanicum*, Nees.

14. *Myristica moschata*, L.

15. *Virola sebifera*, Aubl.

16. *Cocos nucifera*, L., and probably other species of the genus.

17. *Elais Guineensis*, Jacq., and other Palms, such as *Euterpe oleracea*, Mart., and *Cenocarpus distichus*, Mart.

Besides these Vegetable Tallows, obtained in considerable quantity and of known origin, Mr. Solly mentions two of unknown origin, the Minna Batta described by Dr. Thomson, and a green solid oil received by him from Bombay under the name of Kinknail; and

enumerates various plants from which solid oils have been procured in small quantities, and the list of which might probably be enormously increased.

Read also the conclusion of Mr. Griffith's memoir "On the Root-Parasites referred by authors to *Rhizanthæa*, and their Allies."

This extensive memoir, or series of memoirs, commences with "An Attempt to analyse *Rhizanthæa*," as established by Prof. Endlicher and by Prof. Lindley, from which the author deduces the inference, "that in the construction of the group called *Rhizanthæa*, a remarkable diversity of characters has been sacrificed to an appearance resulting from parasitism on roots, and to an assumed absence of any ordinary form of vegetable embryo."

In arriving at this conclusion, his line of argument is summed up as having especial reference to the three following points: "In the first place," he says, "I have endeavoured to extend the objections urged by Mr. Robert Brown, founded on the presence of a vascular system, and the absence of any abstract peculiarity in the embryos of these plants. I have also attempted to show that these plants are not similar in their parasitism, and that even in those which I have examined, there would appear to be two remarkably different types of development of the embryo. Secondly, I have alluded to the opposition presented, as it seems to me, by *Rhizanthæa* to the system of Nature, a chief point of the plan of which seems to me to consist in an extensive interchange of characters, either positively by structure or negatively by imitation of structure. Thirdly, I have adverted to a want of uniformity in opinion of the founders regarding its rank or value, incompatible, as it appears to me, with any group of the system of Nature. And in conclusion, I beg to add that my impression is that *Rhizanthæa* are an entirely artificial group, not even sanctioned by practical facility, which is the only merit of an artificial association, and that its adoption is a retrograde step in the course of philosophical botany."

To the family of *Rafflesiaceæ*, Mr. Griffith adds a new genus with the following characters:—

SAPRIA.

CHAR. GEN.—*Flores* dioici. *Perianthium* duplici serie 5-partitum, æstivatione imbricativum; faux coronâ foratâ clausa; tubus intûs 20-carinatus. *Mas*: *Antheræ* 20, uniseriatim infra caput columnæ fungiforme verticillatæ, discretæ, 2—3-loculares, apice porosæ. *Ovarii* cavitas nulla. *Fœm*: *Antheræ* castratæ. *Ovarium* 1-loculare; placentæ indefinitæ, parietales; ovula indefinita. *Columnæ* apex fungoideo-dilatatus (c medio conum verrucosum exserens, disco piloso). *Fructus* —.

Planta parasitica, habitu Rafflesiaë. Flos magnus, carnis colore, odore putrido.

SAPRIA HIMALAYANA.

Hab. in Jugi Himalayani Montibus Mishmee Assamiæ Superioris ad lat. Bor. 27° 50', long. Orient. 96° 27', altit. pedes 3000—5000.

The description of this plant is accompanied by observations on its mode of parasitism, on its vascular structure, on the plicæ of the inside of the tube of the perianthium (which the author suggests may perhaps be considered to represent a second series of stamina), on the inner membrane of the cells of the anthers, on the obstacles to independent impregnation, and on the natural relations of the genus, and the characters by which it differs from *Rafflesia* and *Brugmansia*, between which Mr. Griffith places it.

Mr. Griffith next proceeds to offer some observations on *Cytineæ*, and on the genera *Hydnora* and *Cytinus*. He believes that the difference in the direction of the nuclei of the ovula in *Cytineæ* and *Rafflesiaceæ* may perhaps be of some use in discriminating them; but thinks it necessary to observe that in *Nepenthes distillatoria* of the Calcutta Botanic Garden, the most marked instances of *ovula anatropha* and *antitropha* are to be met with in the ovaria at their mature state, to which circumstance he attributes the discrepancies in the accounts of the direction of the radicle of the ripe seed of that genus. His observations on *Hydnora* were made on specimens of *H. Africana* both in the dry state and in pyroligneous acid sent to him by Mr. Harvey from the Cape of Good Hope. He regards the anthers as indefinite, and describes the stigma as “discoideum, trilobum, e lamellis plurimis in placentas totidem pendulas undique ovuliferas productis,” a structure which, if correctly determined, appears to him to present another objection to the placentary hypothesis of M. Schleiden. He also notices the apparent opposition of the lobes of the stigma to the lobes of the staminal column. In regard to the composition of the pistillum he hesitates between regarding it as highly compound and analogous to *Papaver* and *Nymphaea*, the space between each lamella corresponding with a carpellary leaf, and each lamella itself being compound, or considering it as made up of only three parts, to which latter opinion his own observations and those of Mr. Harvey would lead.

Mr. Griffith's observations on *Cytinus* are derived from specimens of *C. dioicus*, Juss., also sent to him from the Cape of Good Hope by Mr. Harvey. He follows Jussieu and Endlicher in referring the Cape species to the genus *Cytinus*. He regards the terminal teeth or lobes of the staminal column as productions of the connectivum,

and not as rudiments of stigmata; and believes the anthers to be unilocular.

To his remarks on *Cytineæ* Mr. Griffith appends an account of two Asarineous plants, natives of Malacca, *Thottea*, Rottb., and *Asiphonia*. To the description of the former of these given by Rottböll from Kœnig's MSS. he adds several particulars. Of the latter, discovered by himself, he gives the following generic character:—

ASIPHONIA.

Perianthium æquale, rotatum, tripartitum, tubo nullo. *Stamina* 8—10, uniseriata; filamentis nullis. *Stigma* discoideum, sinuoso-lobatum. *Pericarpium* siliquæforme, 4-loculare, 4-valve, polyspermum. *Semina* trigona, rugoso-papillosa.

Frutex *subscandens*, facie *Piperis fruticosæ* *cujusdam*; articulis *tumidis*. Folia *venatione melastomaceo-piperoideâ*. *Corymbus terminalis*; spicis *paucifloris*; floribus *sursùm secundis bibracteolatis*.

ASIPHONIA PIPERIFORMIS.

Hab. in Provinciâ Malacca, ad margines sylvarum primævarum, copiosè versùs Ayer Punnus Rhim.

Mr. Griffith points out the near relationship of this genus to *Bragantia*, Lour., from which it is chiefly distinguished by the absence of any tube to the perianthium, its cordate sessile anthers, and discoid sinuate stigma. He suggests, however, that it may possibly be regarded as only a subordinate modification of that genus, and gives an arrangement of the known species in conformity with that view.

In connexion with these genera Mr. Griffith gives his views of the nature and composition of the stigma, which are essentially similar to those published by Mr. Brown in the second part of Dr. Horsfield's 'Plantæ Javanicæ Rariores,' to which work Mr. Griffith refers in a note stating that he did not become acquainted with it till several months after his own observations were written. He defines the stigma to be "the external communication of the conducting tissue, which itself communicates with the placentæ, and is in several cases at least (as in *Trewia nudiflora*) manifestly a continuation from them." Of its theoretical origin he desires to speak with caution, but notices two distinct cases of monstrosities affecting two Leguminous plants, in which the stigmatic surface is evidently a continuation of the placental margins of the carpellum. The ordinary relations may, he thinks, be obscured by several causes; such as separation of parts usually cohering, cohesion of parts usually distinct, division of the stigmatic part of the style, and division of the style of the simple carpellum. The stigmata of each carpellum may be distinct from each other or from those of the next carpellum; or adhesion may

take place between stigmatic surfaces ordinarily distinct, whereby the stigmata so resulting appear to alternate with the styles. Instances of the former occur in *Euhalus*; of the latter in *Orobanche*, if the author's observations are correct, in *Papaveraceæ*, and perhaps in all cases in which the stigmata, being apparently equal in number to the placentæ, are said to be opposite to them.

The succeeding portion of Mr. Griffith's memoir relates to *Mystropetalon*, Harv., referred by Sir Wm. J. Hooker to the order *Rhizanthææ*, group *Balanophoreæ*. Mr. Griffith, on the contrary, who describes the *Mystropetalon Thomii* from specimens obtained from Mr. Harvey, regards it as a plant *sui ordinis*, having no relation to any other plant admitted into *Rhizanthææ* except *Cynomorium*, to which it seems to him to present considerable resemblance in the structure of the stamen and of the female flower. It also offers, he thinks, curious agreements with *Loranthaceæ*, and he would at present consider it (doubtfully) as the homogeneous-embryo form of that order which he takes to include *Proteaceæ*, *Santalaceæ*, &c., and which nearly agrees with Prof. Lindley's alliance *Tubiferaæ*.

Sarcophyte also is described from specimens transmitted by Mr. Harvey. Mr. Griffith regards its affinities as very obscure; he objects to its being placed either in *Cytineæ*, *Cynomoriaceæ*, or *Balanophoreæ*, and suggests that on the whole the general tendency of the plant is towards *Urticeæ*.

Mr. Griffith next examines the family of *Balanophoreæ*, and gives distinctive characters of *Balanophora*, *Langsdorffia*, *Phæocordylis*, *Helosis* and *Scybalium*. The following are the characters which he assigns to *Balanophora* and *Phæocordylis* :—

BALANOPHORA, *Forst.*

Sexus dielines, rarissimè monoclines. *Flores masculi* bracteati. *Perianthium* 3—5-sepalum, æstivatione valvatum. *Stamina* totidem opposita, monadelphæ, bilocularia (in unicâ specie multilocularia). *Flores fæminei*: *Ovaria* stipitata, receptaculis apice incrassato-glandulosis affixa, nuda. *Stylus* setaceus, persistens. *Stigma* inconspicuum. *Fructus* pistilliformes, sicci.

PHÆOCORDYLIS, *Griff.*

Sexus dielines. *Flores masculi* ignoti. *Flores fæminei*: *Ovaria* in axi sessilia, nuda, pilis paraphysiformibus immixta. *Stylus* filiformis, exsertus, deciduus. *Stigma* subcapitatum. *Fructus* compressi (striati) apice subpapilloso.

Of *Balanophora* he describes as new five species with the following characters :—

B. BURMANNICA, squamis laxè imbricatis, bracteis truncatis parùm cana-

liculatis, perianthio masculino extùs carneo demùm sanguineo, columnâ staminum elongatâ, antherarum locellis basi discretis.

Hab. in Regno Burmannico, ad fl. Salueen.

B. AFFINIS, squamis et bracteis præcedentis, floribus (masculis) pallidis, columnâ staminum brevi subrotundâ, locellis antherarum basi confluentibus.

Hab. in Collibus Khasiyanis.

Præcedenti minor; an verè distincta?

B. ALVEOLATA, squamis arcetè imbricatis, bracteis profundè canaliculatis inter se favi instar dispositis, columnâ staminum subrotundâ.

B. dioica, *R. Br. in Royle, Illustr. p. 330. t. 99?*

Hab. in Collibus Khasiyanis.

B. PICTA, squamis distantibus laxis (luteis), spicâ fœmineâ obscurè sanguineâ.

Hab. in Montibus Mishmee jugi Himalayani.

B. (POLYPLETIA) POLYANDRA, columnâ stamineâ brevi latâ, antheris indefinitis 1-ocularibus.

Hab. in Collibus Khasiyanis.

With reference to these species Mr. Griffith enters at considerable length into their anatomical and external structure, and in the course of his observations directs attention to the resemblance of the pistilla to the pistilla of *Musci*, and more especially to those of some evaginate *Hepaticæ*, and to the effects produced by the action of the pollen on the styles. "Indeed," he observes, "in the development of the female organ, the continuous surface of the style before fecundation, and its obvious perforation after, *Balanophora* presents a direct affinity to a group of plants, with which otherwise it has not a single analogy." On this ground he objects to the association of *Balanophoræ* with such highly developed families as *Rafflesiaceæ* and *Cytineæ*. "As a mere hypothesis," he adds, "I would consider it as the homogeneous-embryo form of *Urticinæ*, forming a direct passage in one, and usually the more perfect, structure to *Musci* and *Hepaticæ*."

Of *Phæocordylis* (a name used by him to prevent confusion, as he has not sufficient knowledge of Dr. Wallich's plant to determine whether his genus is the same as that doubtfully proposed in Dr. Wallich's list under the name of *Sarcocordylis*) he describes and figures a single species, *Phæocordylis areolatus*, collected in the Khasiya Hills. He compares its structure with that of *Balanophora*, notices several curious peculiarities, and adverts to the structure of the hairs in which the fruits are imbedded as presenting a remarkable analogy with the paraphysiform appendages of *Drepanophyllum* and

certain *Neckeræ*, and also with the bodies which he suspects to be the male organs of Ferns.

Lastly, Mr. Griffith adds the description of a new genus which he dedicates to the memory of Mr. Thomas Smith, referred to by Mr. Brown in terms of high commendation in his remarks on *Kingia*. This genus is characterized as follows under the anagrammatized name of

THISMIA.

CHAR. GEN.—*Perianthium* superum, campanulatum (caducum), 6-partitum; laciniis 3 exterioribus (brevibus) oblongis, 3 alternis interioribus (longissimis) subulatis; fauce annulo semiclausâ. *Stamina* 6, fauci inserta, perianthii laciniis opposita, deflexa insuper parietem tubi internum; filamenta brevia, discreta; antheræ (maximæ) secus margines connatæ, membranâ bilanellosâ terminatæ, biloculares, loculis parvis distantibus adnatis. Ovarium inferum, 1-loculare; placentæ 3 parietales, supra medium ovuligeræ; ovula indefinita, anatropa. *Stylus* brevis. *Stigmata* 3 bifida. *Fructus* carnosus, truncato-turbinatus, apice pericarpium circumscisso dehiscens, 1-ocularis. Semina indefinita, placentis 3 parietalibus demùm liberis affixa. *Embryo* indivisus, homogœneus.

Planta *pusilla, aphylla, radicum parasitica, aspectu cereaceo*. *Perianthium luteum, coccineo pictum*.

THISMIA BRUNONIS.

Hab. ad pedes Bambusarum in humo ligno semiputrido farcto prope Palar Oræ Tenasserim, ad grad. lat. bor. 12° 50', long. orient. 98° 20'.—Flor. et fruct. lect. Mense Octobris, 1834.

Some observations follow on the mode of venation of the perianthium, on the dehiscence of the fruit, and on the position of the plant in the natural system, which the author regards as intermediate between *Tacceæ* and *Burmanniaceæ*. He adds that he is disposed to consider it as a Monocotyledonous form of the albuminiform homogœneous embryo, and as the analogue of *Rafflesiaceæ* and *Cytinææ* of Dicotyledons.

Associated with *Thismia* grew a species of *Salomonina* and a species of *Burmiania*, both having the ordinary appearance of plants parasitic on roots. The former is characterized as

SALOMONIA APHYLLA, parasitica, floribus pentandris.

The paper was accompanied and illustrated by an extensive series of coloured drawings.

November 5.

E. Forster, Esq., V.P., in the Chair.

Joshua Clarke, Esq., presented specimens of *Galium Vaillantii*, DeC., gathered by himself at Saffron Walden, in the county of Essex.

James Backhouse, jun., Esq., and G. S. Gibson, Esq., presented specimens of *Spergula stricta*, Swartz, from Widdy Bank, Teesdale, Yorkshire, and of *Equisetum Drummondii*, Hook., from Winch Bridge, Teesdale; both species gathered for the first time in England.

William Borrer, Esq., F.L.S., presented specimens of *Leersia oryzoides*, Sw., discovered by himself in Sept. 1844, fringing the ditches in Henfield Level, Sussex.

Read, a memoir "On the *Medusa proboscidalis* of Forskähl." By Prof. Edward Forbes, F.L.S. &c.

The author met with this Medusa on the coast of Asia Minor, and communicates the result of his examination of its form and structure. The umbrella of the specimen described measured two inches and three quarters in diameter, and was perfectly hemispherical and transparent. The margin had a pink border, from which sprung at regular intervals six very long extensile tentacula, at the base of each of which is a minute ocellus. Opposite and above the origin of each of these tentacula, and on the inner surface of the bell, is a phylliform space, of a different tissue from the rest of the umbrella: these have hitherto been described as stomachs, but are in reality the ovaries; through the centre of each runs a narrow canal, and between each in the interspace are seven lanceolate, truncate markings. From the centre of the inferior surface springs a proboscis or peduncle, four inches in length, down which the gastric vessels run; this peduncle is marked by six longitudinal bands of pinkish contractile tissue; at its extremity it bears a hollow bell-shaped body, bordered by six triangular lips: the cavity of this is the true stomach; the gastric vessels spring from it, and go to open into a circular vessel surrounding the margin of the umbrella.

The author's observations, demonstrating the true position of the stomach and reproductive organs in this animal, do away with the anomalous definition formerly given of the genus *Geryonia*, to which it belongs, and require the substitution of a new generic character, which may be expressed as follows:—

GERYONIA, *Eschscholtz.*

Umbrella hemisphærica: ovaria plura phylliformia in circuitu disci:

cirrho marginales distantes: ocelli nudi: pedunculus elongatus, pyramidatus, ventriculum parvum in extremitate gerens; ore lobato, fimbriato.

Type, *Geryonia proboscidalis*.

November 19.

R. Brown, Esq., V.P., in the Chair.

Read a Note by William Griffith, Esq., F.L.S. &c., to his paper "On the Ovulum of *Santalum*, *Osyris*, *Loranthus*, and *Viscum*," printed in the last Part of the Society's Transactions.

In this note Mr. Griffith states, that "having had opportunities, after my revised examination of *Santalum album*, of examining a Malacca species of *Osyris* (belonging to a section characterized by a quinary number of parts of the flower, a less tendency to separation of the sexes, and habit), I find full grounds for believing that the mode of development of the ovulum of *Osyris Napatensis* is altogether like that of *Santalum album*, the only difference being the unimportant one of the short anterior prolongation of the embryo-sac outside the nucleus. The minuteness of the ovulum, and the rapidity with which the anterior exerted part above the septum becomes filled with albuminous tissue, during which the proper membrane of this part of the sac becomes incorporated with the albuminous tissue, must be my apologies for this additional and very important error.

"I may take this opportunity of stating, that this Malacca *Osyris*, deducting the great minuteness of the ovulum, has given me as good evidence as *Santalum* in my opinion has, of the non-existence of any cell or body of or in the embryo-sac, from which the embryo is derived, *independent of the pollen-tube*. The vesicle from which the embryo is to be derived does not appear to exist before the application of the pollen-tubes to the sac, it being in fact, so far as my means of observation enable me to go, the anterior extremity of the pollen-tube itself."

Read also a paper "On the Development of the Ovulum in *Avicennia*," by William Griffith, Esq., F.L.S. &c., containing a more detailed description of the process than the note referred to in the 'Proceedings,' p. 170-171.

Mr. Griffith states that *Avicennia* has, like *Santalum* and *Osyris*, a free central placenta with pendulous ovula; the same posterior elongation takes place in the embryo-sac; and the embryo is, at least when matured, external to the nucleus or body of the ovulum. The ovula of *Avicennia* appear to be nucleary; their central tissue first becomes denser than the rest, and in this denser tissue, at a period antecedent to fecundation, is found the embryo-sac, having usually an enlarged apex or head and a subcylindrical body. Subsequent to the application of the pollen-tubes to the apex of the sac, and the formation of cellular tissue, the head of the embryo-sac acquires a short prolongation posteriorly in the direction of the axis of the ovulum, and its subcylindrical body is also prolonged posteriorly within the inner side of the same organ. While the albuminous tissue in the head of the sac increases in bulk, and the rudiment of the future embryo is developing, the head enlarges and passes out of the apex of the ovulum, and the prolongation of the subcylindrical body continues to increase in length. At a subsequent period there is formed on the anterior surface of the albuminous mass, now become external to the ovulum, a curved furrow or groove, corresponding with the points of the cotyledons of the young embryo; and the posterior prolongation of the body of the sac passes backwards into the placenta, within which it is divided in a digitate irregular manner. In the next stage the points of the cotyledons protrude through the groove, and as the embryo increases in size they become more and more exposed, the part of the albumen situated between the inner cotyledon and the body of the ovulum becoming at the same time enlarged and flattened, and increasing in length equally with the cotyledons themselves. In the mature embryo the radicle alone remains imbedded in the albuminous tissue, the cotyledons being quite naked.

“It is curious,” Mr. Griffith observes, “that this prolongation [of the embryo-sac] has only been observed in association with a particular form of the free central placenta. So far as I know,” he adds, “it is the only instance of an embryo-sac prolonged posteriorly, it may be said, from two points of its surface.” And further: “In all the really analogous instances in which the albumen is exterior to the ovulum, it is *always* exterior, that part of the embryo-sac in which it is developed being protruded long before any albuminous tissue has been developed*.”

* In a Memoir by M. Planchon, published at Montpellier, 1844, “Sur les développements et les caractères des vrais et des faux arilles, suivi de con-

In conclusion, Mr. Griffith refers to the observations of Mr. Brown on the ovula of *Avicennia* in the 'Prodromus Floræ Novæ Hollandiæ,' and in Dr. Wallich's 'Plantæ Asiaticæ Rariores,' and states that the most important difference between this last account and that which he has given is, that he finds the embryo *only* to be erect. "The embryo, in its earlier stages of development, undergoes a degree of change of direction, but only sufficient to enable it to pass up outside the ovulum in the same direction it would have maintained had it been ordinarily developed."

The paper was illustrated by a series of coloured drawings.

December 3.

E. Forster, Esq., V.P., in the Chair.

Walter Ewer, Esq., was elected a Fellow.

Read, some "Remarks on Vegetable Physiology." By Mr. James Main, A.L.S.

Mr. Main's object in the present paper appears to be the reproduction before the Society of the leading ideas on vegetable growth contained in his 'Illustrations of Vegetable Physiology,' published in 1833, and to state his objections to some received theories on that

siderations sur les ovules de quelques Véroniques et de l'*Avicennia*," it is shown that in two species of *Veronica* (*V. hederæfolia* and *V. cymbalaria*) (and consequently in plants with the ordinary form of placenta) the nucleary ovula are furnished with embryo-sacs, acquiring during the progress of their growth two tubular prolongations, one from near each extremity, the upper of which passes into the placenta, and there becomes digitately divided. In these plants also the albuminigerous portion of the embryo-sac becomes, during the progress of its development, external to the nucleus. In other species of the same genus (*Ver. agrestis* and *V. arvensis*) the ovula are equally reduced to a nucleary form; but the embryo-sac is much less developed at its extremities, and a tegument derived from the nucleus continues to enclose it up to the complete maturity of the seed. Comparing these observations on *Veronica* with the description given in 1818 by M. A. de St. Hilaire of the development of the ovulum of *Avicennia*, M. Planchon comes to the conclusion, that "Il devient impossible de ne pas considérer, avec Brown, comme l'ovule lui-même le corps oblong pris [par M. A. de St. Hilaire] pour un cordon ombilical, et de ne pas voir dans le tubercule arrondi qui sort de la fente du corps oblong, un sac embryonnaire analogue à celui de la Véronique, et destiné, comme ce dernier, à accomplir, hors du nucelle, toutes ses évolutions."—SECR.

important subject. He denies the descent of the sap, and asks, "Who has met with sapless branches in winter, or surcharged roots at the same season?" He states that "the spring movement of the sap begins (and necessarily *must* begin) at the top of the tree, and its fluxion is generated gradually downwards until the whole is in motion." It is by means of this descending fluidity, and not by any descent of the sap itself, that he explains the callosities or swellings observed above a ligature, on the upper edge of a wound, and in various other circumstances. Instead of attributing the formation of the tissues of the plant to the organizable property of the elaborated sap, he believes that the membranes and every other organic part or constituent of the plant have rudimental existence and identity before development. He regards the *cambium* as the seat of vegetable life and the origin of all vegetable growth. From this living body (which he calls the *indusium* or *vital membrane*) he believes that the axis of wood is annually enlarged in diameter, and the bark is thickened; from this, and this only, buds and roots are produced; and wounds are healed by its gradual extension. The paper concludes by a reference to the opinions of Bonnet, DeCandolle, Mirbel, and Dutrochet.

December 17.

R. Brown, Esq., V.P., in the Chair.

Dr. Lankester, F.L.S., exhibited a specimen of an Agaric in which gills were developed on a portion of the surface of the pileus, directly over the stipes, resulting apparently from an extension of the growth of the stipes, and a rupture of the external membrane of the pileus, throwing up the internal or gill-producing membrane.

Read, "Additional Remarks on the *Spongilla fluviatilis*." By John Hogg, Esq., M.A., F.R.S., F.L.S. &c.

In this paper Mr. Hogg commences by claiming a priority to M. Laurent in the discovery of the locomotive germ-like bodies of *Spongilla*, and in comparing them with the spontaneously moving spores of *Ectosperma clavata* of Unger. In proof of this priority he refers to his memoir, published in 1840, in the eighteenth volume of

the Society's Transactions, in the first part of which, read before the Society on the 18th of December 1838, those bodies are described as having been observed by him in August 1838, and are compared with the locomotive sporules of the *Ectosperma*. An abstract of this part of Mr. Hogg's memoir appeared in the 'Proceedings' of the Society at the beginning of 1839, and was reprinted in the number of the 'Annals of Natural History' for March 1839. Of these several publications Mr. Hogg states that no notice is taken by M. Laurent in his recent work entitled 'Recherches sur l'Hydre et l'Éponge d'Eau douce,' Paris 1844, in which the discovery of the locomotive germs of the freshwater sponge is apparently claimed by the author as his own.

Mr. Hogg then proceeds to remark on the discrepancies of authors with regard to the existence of cilia on these bodies, and on the spores of the *Ectosperma*. He accounts for his having overlooked them in the *Spongilla*, on the supposition that the germs which he observed under a very high power of the compound microscope had reached the period when, as M. Laurent states, "ils perdent leurs cils pour toujours," and notices that it appears, from M. Thuret's recent observations, that the same circumstance occurs in the spores of the *Ectosperma*. This resorption or disappearance of the cilia after a certain period will readily account for the denial of their existence by practised microscopical observers.

The existence of cilia subservient to locomotion is far from determining, in Mr. Hogg's opinion, the question of the animal nature of the bodies to which they belong, although the zoocarpic theory, which he regards as most improbable, appears to be still gaining ground. He believes the motive power of the cilia of the sporules of *Spongilla* and the *Algæ*, as also of the Sea-Sponges, to be dependent on some peculiar organization not connected (as in the locomotive gemmules of a zoophyte) with any muscular apparatus; unless indeed, as he has before suggested, mere endosmosis and exosmosis should be found sufficient to produce it.

For these and other reasons which are detailed in his paper, Mr. Hogg still believes both the *River* and *Sea-Sponges* to be vegetable productions, and thinks that "until they shall be discovered to possess a stomach or a gastric sac, no zoologist can possibly consider them to belong to the Animal Kingdom."

January 21, 1845.

R. Brown, Esq., V.P., in the Chair.

John Daniel Vittoria Packman, Esq., M.D., and Edward Frederick Leeks, Esq., were elected Fellows.

A Note was read, addressed to the Secretary, by John Curtis, Esq., F.L.S. &c., containing the description of a cocoon of the Emperor Moth (*Saturnia Pavonia-minor*), which on being longitudinally divided was found to have internally, in place of the chrysalis, a series of cells so analogous to those represented by Mr. Curtis in the nineteenth volume of the Society's 'Transactions,' plate xxxi. fig. 5, as to leave no doubt on his mind that the woolly masses there exhibited are the cocoons of some large South American *Bombyx*, and that the substance of the caterpillar has been converted into cells by the larva of the Tenthredinidous insect. But although the theory of the nest there figured having been constructed by an insect of that family is thus set aside as erroneous, it is only to make evident a still greater anomaly in its economy, viz. that its larvæ are parasitic. In the present instance Mr. Curtis was unable, after the most rigid scrutiny, to find any vestige of a perfect insect. A dried and broken maggot was all that could be perceived, and its fragments on being put together bore more resemblance to the larvæ of the *Ichneumonidæ* than to those of the *Tenthredinidæ*.

Mr. Curtis states that the cells most analogous to these are those formed by the *Microgaster alvearia*, which are as regular as those of a honey-comb, and adds that it appears from a notice in the 'Transactions of the Entomological Society,' vol. iii. p. 35, that the pupæ of the Eggar-moths are also infested by parasitic *Ichneumonidæ*. A sketch of the cocoon of the Emperor Moth and of the cells formed by its parasitic inhabitants accompanied the note.

Read also, "Some Notes on the Natural History of Norfolk Island," extracted from the papers of Capt. Alexander Maconochie, R.N., late Lieutenant-Governor of the island.

February 4.

R. Brown, Esq., V.P., in the Chair.

George Robert Gray, Esq., was elected a Fellow.

Read the commencement of a paper "On the Nervures of the Wings in Lepidopterous Insects; and on the genus *Argynnis* of the 'Encyclopédie Méthodique.'" By Edward Doubleday, Esq., F.L.S. &c. &c.

Read also "Observations on the immediate causes of the Ascent of the Sap in Spring." By Arthur Henfrey, Esq., F.L.S. &c. &c.

Mr. Henfrey thinks that none of the causes generally stated, viz. 1. Endosmosis; 2. Capillary Attraction; and 3. Evaporation, are sufficient to determine the first start of the sap. He objects to attributing to the two first-named causes (endosmosis and capillary attraction) a primary part in the production of this phenomenon, that they cannot act where there is no outlet above, and where consequently no current can take place. As regards evaporation, he is inclined to believe that it does not come into operation until a certain quantity of the sap has been absorbed and assimilated to the new tissues. He refers to the precaution taken in the autumn to cover up those portions of the plant which are exposed to the atmosphere so as to protect them from its action, and to the fact that buds burst forth, not from evaporation, but on the contrary, from being gorged with moisture, as proofs that evaporation cannot be regarded as giving the primary impulse to the current of the sap. The true cause of the ascent of the sap must, he thinks, be looked for in the chemical changes which take place in the materials stored up in the cells during the autumn. The insoluble grains of starch are converted into soluble substances (dextrine and sugar) which are dissolved by the water always present in the tissues. A current is thus produced by two concurrent circumstances, viz. the *exhaust* arising from the syrup occupying less space than the materials from which it was derived, and the *endosmosis* resulting from the increased density of the fluid contents of the cells. This chemical change Mr. Henfrey believes to be brought about by the increase of temperature, but whether it is immediately effected through the action of *diastase* or other substances he is not at present prepared to give an opinion.

February 18.

W. H. Lloyd, Esq., in the Chair.

John Walton, Esq., was elected a Fellow, and Mr. Thomas Hall an Associate.

Read a memoir "On *Agaricus crinitus*, L., and some allied species." By the Rev. M. J. Berkeley, M.A., F.L.S. &c. &c.

Mr. Berkeley refers to the *Fungi* of the Linnean herbarium as few in number but in good condition, and comprising some remarkable forms. Among these not the least interesting is the *Agaricus crinitus*, which, together with a few allied species, it is the object of the paper to illustrate.

1. *Lentinus crinitus*, pileo latè infundibuliformi repando badio-rufo fibris innatis apice liberis vix fasciculatis regulariter striato margine reflexo, stipite æquali pallidè sericeo-farinoso, lamellis acutis integris rigidiusculis subdistantibus glandulosis decurrentibus posticè anastomosantibus.

Agaricus crinitus, L. *Sp. Plant. ed. 2.* p. 1644.

Hab. in ligno in Americâ Australi, *Rolander in Herb. Linn.*

The *Agaricus crinitus* of Swartz and Fries (figured and described under the same name by Mr. Berkeley in the 'Annals of Natural History') is very distinct, and has since been named by Mr. Berkeley *Lentinus Swartzii*.

2. *Lent. tener*, pileo tenui regulari latè infundibuliformi repando cervino fibris fasciculatis subcrispis vestito subtùs sericeo-striato margine subsulcato, stipite gracili æquali pallido granulato-furfuraceo, lamellis subdistantibus pallido-ligneis opacis lato-denticulatis glandulosis decurrentibus posticè vix anastomosantibus.

Lent. tener, *Klotzsch*; *Fries Syn. Lent.* p. 6, *Epicr.* p. 389; *Berk. in Hook. Lond. Journ. of Bot.* ii. p. 362.

Hab. in ligno, in Mont. Organ, *Gardner*; ad *Novam Aureliam*, *Klotzsch*.

3. *Lent. Schomburgkii*, pileo tenui latè infundibuliformi repando cervino floccis mollibus fasciculatis leviter crispatis vestito demùm medio subglabrescente sericeo-striato, stipite æquali sublurido parcè furfuraceo apice sericeo, lamellis confertis tenuibus decurrentibus posticè anastomosantibus pallidè cervinis eglandulosis acie denticulatis.

Hab. in ligno sicco, in Guianâ Britannicâ, *Schomburgk*.

4. *Lent. nigripes*, Fries.

On the synonymy of this species, as well as of the two preceding, Mr. Berkeley makes some observations.

5. *Lent. Leveillei*, pileo tenui latè infundibuliformi repando explanato rigidiusculo floccis crispatis subfasciculatis rarioribus vestito, stipite æquali nigro-furfuraceo, lamellis confertis fuscatis decurrentibus glandulosis ochraceis acie granulato-dentatis posticè vix anastomosantibus.

Hab. ad Surinam.

The paper was illustrated by a series of drawings from the pencil of Mr. J. De C. Sowerby, F.L.S. &c.

March 4.

R. Brown, Esq., V.P., in the Chair.

James Scott Bowerbank, Esq., Francis Plomley, M.D., and David Price, Esq., were elected Fellows.

Read the commencement of "An Enumeration of the Plants of the Galapagos Islands." By J. D. Hooker, Esq., M.D., F.L.S. &c.

Read also some Additions and Corrections to his "Monograph of the *Myriapoda Chilopoda*" read during the last Session. By George Newport, Esq. Communicated by the Secretary.

These additions have reference chiefly to the characters and habits of the family *Lithobiidæ*, and to the genus *Scolopendrella* of M. Gervais. This genus Mr. Newport had in his *Synopsis Generum*, published at p. 193, proposed to refer as a subfamily to *Geophilidæ*; but on a closer examination of its characters, he finds that they indicate a much higher type of development and approximate it very nearly to *Lithobiidæ*. He proposes therefore to establish *Scolopendrellidæ* as a separate family, and to place them next after *Lithobiidæ*.

March 18.

E. Forster, Esq., V.P., in the Chair.

Edward Doubleday, Esq., Surgeon, was elected a Fellow.

A compound Microscope for the use of the Society was presented by the following Fellows:—

Edward Forster, Esq., V.P.
 Thomas Bell, Esq.
 J. J. Bennett, Esq.
 F. Boott, Esq., M.D.
 E. Doubleday, Esq.
 J. A. Hankey, Esq.
 J. D. Hooker, Esq., M.D.
 J. Janson, Esq.
 F. H. Janson, Esq.
 T. C. Janson, Esq.
 W. H. Lloyd, Esq.

J. Milne, Esq.
 F. G. P. Neison, Esq.
 D. Sharpe, Esq.
 R. H. Solly, Esq.
 E. Solly, Esq.
 W. H. Solly, Esq.
 N. B. Ward, Esq.
 A. White, Esq.
 J. E. Winterbottom, Esq.
 W. Yarrell, Esq.

Read “Remarks on the Examination of some Fossil Woods which tend to elucidate the structure of certain tissues in the recent Plant.”
 By Edwin John Quekett, Esq., F.L.S. &c. &c.

The structures which Mr. Quekett proposes to elucidate are the fibres of spiral vessels and the dots of the woody fibres of *Coniferæ*.

On the first head he states, that in the examination of a specimen of fossil Palm-wood, he observed that a portion of it readily broke down into minute fragments, which, on examination under the microscope, were seen to be composed of cylinders more or less elongated and minute rounded granules. Round the cylinders was wound a perfect screw (with either a single or compound helix) undoubtedly fashioned from the interior of the spiral vessel, and affording the most satisfactory evidence that the spiral fibre is really formed in the interior of the vessel, as most recent observers have maintained.

On the second point, the nature of the dots on the woody fibres of *Coniferæ*, Mr. Quekett's observations derived from fossils also confirm the views now most generally entertained by microscopic observers of the recent structures. In a specimen of fossil wood from Fredericsberg in Virginia, received from Prof. Bailey, which was easily broken into minute fragments in the direction of the woody fibres, he found a beautiful example of casts of woody tissue with numerous spirals traversing the interior. At various parts were seen

arranged the ordinary coniferous dots, to the outside of which (projecting beyond the outline of the fibre when seen obliquely) adhered small bodies of the same size which bore the precise representation of the coniferous disc, and were evidently casts of cavities existing in the original plant: some of these were also seen detached. These appearances, Mr. Quekett states, prove the correctness of the modern belief, that the discs are formed by depressions on the outside of the walls of two contiguous fibres, giving rise to cavities of a lenticular form.

Mr. Quekett concludes his paper with some observations on the process of silicification in its various stages and modifications; and endeavours thereby to account for the readiness with which some silicified woods break down into separate portions, exhibiting perfect casts of the organs within which the siliceous matter was deposited, while others are cemented into a mass incapable of organic separation.

Read also "Notes on the Variations of Structure in the British species of *Eurytomidæ*." By Francis Walker, Esq., F.L.S. &c.

In this paper Mr. Walker enumerates the variations in each segment of the British *Eurytomidæ*, and comes to the conclusion that, in grouping the species of a genus of this family, the primary divisions may be formed from the variations of the thorax, and the secondary divisions from the variations of the abdomen, of the antennæ, and of the nervures of the wings. He regards *Eurytoma* as the typical genus of the family; and believes that the three genera *Isosoma*, *Systole* and *Decatoma* converge towards it by as many radii. An undescribed genus, to which Mr. Walker gives the name of *Porcia*, is nearly allied to *Decatoma*, and is thereby connected with *Eurytoma*.

Mr. Walker takes a summary view of the three genera *Eurytoma*, *Isosoma* and *Decatoma*, noticing under each the peculiar characters of the genus and the modifications to which they are subject. He points out the number of variations which occur in the British species in the structure of their segments, and gives arranged lists of the species, commencing with those which are most characteristic of the genus, and ending with those which are least so.

Read also the conclusion of Mr. Doubleday's "Remarks on the genus *Argynnis* of the 'Encyclopédie Méthodique,' especially in regard to its subdivision by means of characters drawn from the neuuration of the wings."

Mr. Doubleday commences by referring to the successive attempts

made by Jones, by M. Boisduval, and by M. Lefèvre to apply the characters drawn from the neuration of the wings to the arrangement of *Lepidoptera*; and to the use of characters derived from the same source in the works of M. de Haan, Dr. Rambuhr, and Mr. Westwood. In the present paper he endeavours to test the value of the neuration of the wings in subdividing a large natural group, for which purpose he selects the genus *Argynnis* of the 'Encyclopédie Méthodique.'

After stating generally the theory of the wing proposed by M. Lefèvre, Mr. Doubleday proposes an amended theory as follows: "That the structure of the wings in insects is to have *two* distinct sets of air-vessels or nervures, three belonging to the anterior half of the wing, three to the posterior; that in those species in which the wings are in the most truly normal condition these nervures are all fully developed and all subserve to their true functions; that in descending from these we first find some of the nervures less developed, but still subserving to their functions, then becoming gradually atrophied, and at last disappearing altogether; and that this gradation depends partly on the rank which the species hold in the true system of nature, and partly on their œconomy." The three upper nervures exist, Mr. Doubleday states, in the anterior wings of a large portion of the *Heterocera*; but the lowest or discoidal one is often wanting, though its nervules remain: in the *Rhopalocera* it is always wanting, and its nervules are united either to the subcostal or median nervures.

Admitting the correctness of the above views, we have in the *Rhopalocera* a median nervure with constantly three nervules, above which are the two discoidal nervules, and then the subcostal nervure, generally offering five nervules, but sometimes only three. Various modifications in the number and connexion of these nervules are indicated in different genera.

The genus *Argynnis*, Godart, always offers five subcostal nervules, never, as Mr. Doubleday believes, anastomosing with the costal nervure. Removing from it three species, *Arg. Alcandra*, *Aceste* and *Lucina*, and perhaps *Arg. Metea*, and adding to it some of the *Cethosiæ*, it becomes a most natural group. Of the subdivisions previously made in it Mr. Doubleday takes a brief review, and then proceeds to point out the sections into which he proposes to divide it, which are founded in a great degree on the position of the subcostal nervules.

The first of these is *Agraulis* properly so called; the second comprehends *Argynnis Thais*, *Clagia* and their allies; *Arg. Iole* forms the type of a third; the fourth is formed by the genus *Phalanta* of

Dr. Horsfield, including some species not previously referred to it; the fifth has for its type *Arg. Egesta*; the sixth includes the genus *Clothilda* of M. Blanchard; the seventh M. Boisduval's section *Majores*, with the addition of *Lathonia* and some other species; the eighth comprises his *Minores*, with the exception of one or two species; and the remaining species compose the genus *Melitæa* properly so called. In all these sections Mr. Doubleday describes at length the structure of the nervures and their nervules, and notices the geographical distribution of the species.

The paper was accompanied by a series of figures illustrative of the neuration of the wings of various species.

April 1.

E. Forster, Esq., V.P., in the Chair.

Arthur Hill Hassall, Esq., was elected a Fellow.

Read "Observations on two Malayan species of *Semnopithecus*." By Theodore Cantor, M.D., Civil Surgeon, Prince of Wales's Island. Communicated by T. Horsfield, M.D., V.P.L.S.

The *Semnopithec*i which form the subject of Dr. Cantor's paper are *Semn. cristatus*, Horsfield, and a new species which Dr. Cantor names and characterizes as follows:—

Semnopithecus halonifer, nitidè cinereo-nigrescens, cristâ occipitis canâ, abdomine subalbido, caudâ subcinereâ, facie auribus manibus pedibus tuberibusque ischiaticis nigris, palpebris labiisque lacteis veluti halonibus circumdatis: tarsis palpebrarum nigris, phalangibus digitorum primis membranâ inter se junctis.

Juvenis: Pallidior, cristâ occipitis cinereâ, facie nigro-cærulescenti.

Neonatus: nitidè fulvus.

Of this species, which inhabits the jungle in troops of from five to twenty, Dr. Cantor gives a detailed description, with an account of its habits both wild and in a state of captivity, and details of the dissection of a young male, particularly as regards the stomach, which presented, with some modifications, the same highly developed structure as the other species of the genus which have been examined. It appears to be most nearly allied to *Semn. Maurus*, Horsf.

Semn. cristatus, Horsf., is also a native of Prince of Wales's Island and the opposite part of the Malayan Peninsula. Dr. Cantor com-

compares it with the foregoing species and gives some particulars of its habits in captivity, and of the dissection of a young female.

The paper was illustrated by figures of *Semn. halonifer* and of its stomach and cæcum, and of the head of *Semn. cristatus*, its stomach and gall-bladder.

April 15.

R. Brown, Esq., V.P., in the Chair.

Frederick Staines, Esq., of San Luis Potosi, Mexico, was elected a Fellow.

Read the commencement of a paper, entitled "Some Observations upon the Structure of two new species of *Hectocotyle* parasitic upon *Tremoctopus violaceus*, Delle Chiaje, and *Argonauta Argo*, L.; with an exposition of the hypothesis that these *Hectocotyle* are the males of the *Cephalopoda* on which they are found." By Albert Kölliker, Professor of Physiology and Comparative Anatomy in the University of Zurich. Communicated by R. Brown, Esq., V.P.L.S.

Read also a "Description of the Wild Dog of the Malayan Peninsula." By Theodore Cantor, M.D., Civil Surgeon, Prince of Wales's Island. Communicated by Dr. Horsfield, V.P.L.S.

CHRYSÆUS SOCCATUS, ore vulpino, supernè ferrugineo-fulvus pilis dorsi nigro apiculatis infra subfulvus, rostro naso labiis palpebris striâque obliquâ carpalis nigris, caudæ pendulæ vulpinæ besse apicali nigro, digitis (anticis 5 posticis 4) pilis longioribus occultis veluti soccatis.

This species, of which Dr. Cantor gives a detailed description, appears, he states, to form an intermediate link between *Chrysæus Sumatrensis*, Ham. Smith, and *Chrys. Javanicus* of the same author. But in the former of these two species all the feet are pentadactylous; neither of them has the feet hairy; and the second tubercular tooth of the lower jaw is present in both, but absent in *Chrys. soccatus*. A pair of the last-named species were captured in Malacca and brought to Prince of Wales's Island, where they died a few days after their arrival. Dr. Cantor states, on the authority of Wm. Lewis, Esq., Assistant Resident Councillor at Penang, that they hunt deer and antelopes in troops of from thirty to fifty or more. He gives also some particulars of their anatomy, and a figure of the species.

May 6.

The Lord Bishop of Norwich, President, in the Chair.

Benjamin Clark, Esq., was elected a Fellow; and Il Cavaliere Giambattista Amici, M. G. P. Deshayes, and Prof. Karl Friedrich von Ledebour, Foreign Members.

Read the conclusion of Prof. Kölliker's memoir on the *Hectocotylæ* of *Tremoctopus violaceus* and *Argonauta Argo*.

In this paper Prof. Kölliker gives a detailed description of the external form and anatomical structure of two remarkable parasites referable from their characters to the genus *Hectocotyle* of Cuvier, and bearing much resemblance to the *Hect. Octopodis* of that author. Of one of these, that which is parasitic on the *Argonaut*, Delle Chiaje has given an unsatisfactory account in his Memoirs on Comparative Anatomy, under the name of *Trichocephalus acetabularis*; and Costa has endeavoured, in the sixteenth volume of the second series of the 'Annales des Sciences Naturelles' to prove that it is only a separated portion of the animal on which it is found. But this opinion is, according to Prof. Kölliker, quite erroneous, all its characters indicating beyond a doubt that it is a distinct animal. The two species described were found by Prof. Kölliker at Messina, and are severally named by him *Hect. Tremoctopodis* and *Hect. Argonautæ*, from the animals on which they parasitically live.

Prof. Kölliker enters into a particular statement of the reasons which have induced him to believe that these *Hectocotylæ* are in reality the males of the *Cephalopods* on which they are found; of which reasons he gives the following summary:—

1. The *Hectocotylæ* have arteries and veins, a heart and branchiæ; and hence it is improbable that they should be Epizootic Worms.
2. *Hect. Argonautæ* and *Hect. Tremoctopodis* bear a close relation to the *Cephalopoda* in general, and more especially to the genera on which they are found; inasmuch as they have—
 - a. The same *spermatozoa*;
 - b. Contractile pigment-cells;
 - c. Similarly formed and similarly organized suckers;

- d. The same remarkable arrangement of the muscular fibres—the *Hectocotylæ* in the muscular envelope of the body, the *Cephalopoda* in their arms.
3. Among 280 *Argonauts* examined not a single male was found.
 4. Nevertheless the males must be very numerous, inasmuch as nearly all the *Argonauts* carry impregnated ova.
 5. The *Hectocotylæ* live in the neighbourhood of the female sexual organs of their *Cephalopods*, and are all males.
 6. The eggs of the *Argonaut* contain, according to Madame Power and Maravigna, embryos perfectly similar to the *Hect. Argonautæ*.

If this last statement be correct, adds Dr. Kölliker, there can be no doubt that the *Hect. Argonautæ* is the male of the *Argonaut*.

Read also a continuation of Dr. J. D. Hooker's "Enumeration of the Plants of the Galapagos Islands."

Anniversary Meeting.

May 24.

The Lord Bishop of Norwich, President, in the Chair.

The President opened the business of the Meeting, and the list of the Members whom the Society had lost during the past year having been first read, the Secretary proceeded to read the following notices of some among them.

The deaths among the Fellows amounted to thirteen. The first name is that of

Francis Baily, Esq., who was the son of a banker at Newbury in the county of Berks, and was born at that place on the 28th of April 1774. At the age of fourteen he was sent to London, where he remained in a mercantile house till his twenty-second year, and then travelled for a year or two in the United States. About the year 1801 he entered into business as a stock-broker; and soon afterwards distinguished himself as a mathematician and accountant by a series of highly useful and important works on the Purchase and Renewal of Leases and the Doctrine of Interest, Annuities and Insurances.

In the year 1811 he commenced his astronomical career by the

publication in the 'Philosophical Transactions' of a memoir on the Solar Eclipse said to have been predicted by Thales; and from this time appears to have formed the resolution, which on his retirement from business in 1825 he fully carried out, to devote himself wholly to mathematical, physical and astronomical pursuits. He was one of the founders and the first Secretary of the Astronomical Society, of which he was afterwards four times President; and in everything connected with that Society and with its objects he took a leading, an active, and a most efficient part. His labours in these departments were multifarious, and demanded both intense thought and incessant application. They are too little connected with natural history to admit of detailed consideration here; but a summary of them has been given by Sir John F. W. Herschel in an eloquent memoir of their author, published in the "Monthly Notices of the Royal Astronomical Society," which contains an ample record of the life, character and labours of this eminent man.

Mr. Baily became a Fellow of our Society in 1817: he was also a Fellow of the Royal, Geological and Geographical Societies, an Honorary Member of the Royal Irish Academy, and a Correspondent of the Academy of Sciences of the Institute of France and of various other Foreign Academies. In 1835 the University of Dublin conferred on him the honorary title of D.C.L., and the same honour was awarded to him by that of Oxford in 1844. He died on the 30th of August last in the 71st year of his age.

Charles Cordeaux, Esq., M.D.

The Very Rev. Edmund Goodenough, D.D., F.R.S., Dean of Wells, was the son of the Right Rev. Samuel Goodenough, Bishop of Carlisle, an original Member of this Society, for many years one of its Vice-Presidents, and well-known by his memoirs on British *Carices* and British *Fuci*, published in early volumes of our 'Transactions.' Dr. Goodenough the son was himself much attached to the study of natural history: he was for many years head-master of Westminster School.

William Griffith, Esq., the youngest son of the late Thomas Griffith, was born on the 4th of March 1810, at his father's residence at Ham Common, near Kingston-upon-Thames, in the county of Surrey.

He was educated for the medical profession, and completed his studies at the London University, where he became a pupil of Prof. Lindley, under whose able instructions, assisted by the zealous friendship of Mr. R. H. Solly, and in conjunction with two fellow-pupils of great scientific promise, Mr. Slack and Mr. Valentine, he made rapid progress in the acquisition of botanical knowledge. The

first public proofs that he gave of his abilities are contained in a microscopic delineation of the structure of the wood and an analysis of the flower of *Phytocrene gigantea*, in the third volume of Dr. Wallich's 'Plantæ Asiaticæ Rariores'; and in a note on the development and structure of *Targionia hypophylla*, appended to M. de Mirbel's Dissertation on *Marchantia polymorpha*, both published in 1832. So highly were his talents as an observer appreciated at this early period, that Dr. Wallich speaks of him as one "whose extraordinary talents and knowledge as a botanist entitle him to the respect of all lovers of the science;" and M. de Mirbel characterizes him as "jeune Anglois, très instruit, très zélé et fort bon observateur."

His note on *Targionia* is dated Paris, April 2nd, 1832, and in the month of May of the same year, having finished his studies at the London University with great distinction, he sailed from England for India, which was destined to be the scene of his future labours. He arrived at Madras on the 24th of September, and immediately received his appointment as Assistant-Surgeon in the service of the East India Company.

His first appointment in India was to the coast of Tenasserim; but in the year 1835 he was attached to the Bengal Presidency, and was selected to form one of a deputation, consisting of Dr. Wallich and himself as botanists, and Mr. MacClelland as geologist, to visit and inspect the Tea-forests (as they were called) of Assam, and to make researches in the natural history of that almost unexplored district.

This mission was for Mr. Griffith the commencement of a series of journeys in pursuit of botanical knowledge, embracing nearly the whole extent of the East India Company's extra-peninsular possessions, and adding large collections in every branch of natural history, but especially botany, to those which, under the auspices of the Indian Government, had previously been formed. He next, under the directions of Capt. Jenkins, the Commissioner, pushed his investigations to the utmost eastern limit of the Company's territory, traversing the hitherto unexplored tracts in the neighbourhood of the Mishmee Mountains which lie between Suddiya and Ava. Of the splendid collection of insects formed during this part of his tour, some account has been given by Mr. Hope in the Transactions of the Entomological Society and in the eighteenth volume of our own Transactions.

His collection of plants was also largely increased on this remarkable journey, which was followed by a still more perilous expedition, commenced in February of the following year, from Assam through the Burmese dominions to Ava, and down the Irawaddi to Rangoon,

in the course of which he was reported to have been assassinated. The hardships through which he passed during the journey and his excessive application produced, soon after his arrival in Calcutta, a severe attack of fever, on his recovery from which he was appointed Surgeon to the Embassy to Bootan, then about to depart under the charge of the late Major Pemberton. He took this opportunity of revisiting the Khasiya Hills, among which he formed a most extensive collection; and having joined Major Pemberton at Goalpara, traversed with him above 400 miles of the Bootan country, from which he returned to Calcutta about the end of June 1839. In November of the same year he joined the army of the Indus in a scientific capacity, and penetrated, after the subjugation of Cabool, beyond the Hindoo Khoosh into Khorassan, from whence, as well as from Affghanistan, he brought collections of great value and extent. During these arduous journeys his health had several times suffered most severely, and he was more than once reduced by fever to a state of extreme exhaustion; but up to this time the strength of his constitution enabled him to triumph over the attacks of disease, and the energy of his mind was so great, that the first days of convalescence found him again as actively employed as ever.

On his return to Calcutta in August 1841, after visiting Simla and the Nerbudda, he was appointed to the medical duties at Malacca; but Dr. Wallich having proceeded to the Cape for the re-establishment of his health, Mr. Griffith was recalled in August 1842 to take, during his absence, the superintendence of the Botanic Garden near Calcutta, in conjunction with which he also discharged the duties of Botanical Professor in the Medical College to the great advantage of the students. Towards the end of 1844 Dr. Wallich resumed his functions at the Botanic Garden. In September Mr. Griffith married Miss Henderson, the sister of the wife of his brother, Captain Griffith, and on the 11th of December he quitted Calcutta to return to Malacca, where he arrived on the 9th of January in the present year. On the 31st of the same month he was attacked by hepatitis, and notwithstanding every attention on the part of the medical officer who had officiated during his absence and who fortunately still remained, he gradually sunk under the attack, which terminated fatally on the 9th of February. "His constitution," says his attached friend, Mr. MacClelland, in a letter to Dr. Horsfield, "seemed for the last two or three years greatly shattered, his energies alone remaining unchanged. Exposure during his former journeys and travels laid the seeds of his fatal malady in his constitution, while his anxiety about his pursuits and his zeal increased. He became

care-worn and haggard in his looks, often complaining of anomalous symptoms, marked by an extreme rapidity of pulse, in consequence of which he had left off wine for some years past, and was obliged to observe great care and attention in his diet. In Affghanistan he was very nearly carried off by fever, to which he had been subject in his former travels in Assam. No government ever had a more devoted or zealous servant, and I impute much of the evil consequences to his health to his attempting more than the means at his disposal enabled him to accomplish with justice to himself."

The most important of Mr. Griffith's published memoirs are contained in the Transactions of the Linnean Society. Previous to starting on his mission to Assam, he communicated to the Society the first two of a series of valuable papers on the development of the vegetable ovulum in *Santalum*, *Loranthus*, *Viscum*, and some other plants, the anomalous structure of which appeared calculated to throw light on this still obscure and difficult subject. These papers are entitled as follows:—

1. On the Ovulum of *Santalum album*. Linn. Trans. xviii. p. 59.
2. Notes on the Development of the Ovulum of *Loranthus* and *Viscum*; and on the mode of Parasitism of these two genera. Linn. Trans. xviii. p. 71.
3. On the Ovulum of *Santalum*, *Osyris*, *Loranthus* and *Viscum*. Linn. Trans. xix. p. 171.

Another memoir, or rather series of memoirs, "On the Root-Parasites referred by authors to *Rhizanthææ*, and on various plants related to them," occupies the first place in the Part of our Transactions which is now in the press, with the exception of the portion relating to *Balanophoreæ*, unavoidably deferred to the next following Part. In this memoir, as in those which preceded it, Mr. Griffith deals with some of the most obscure and difficult questions of vegetable physiology, on which his minute and elaborate researches into the singularly anomalous structure of the curious plants referred to will be found to have thrown much new and valuable light.

In India, on his return from his Assamese journey, he published in the 'Transactions of the Agricultural Society of Calcutta,' a "Report on the Tea-plant of Upper Assam," which, although for reasons stated avowedly incomplete, contains a large amount of useful information on a subject which was then considered of great practical importance. He also published in the 'Asiatic Researches,' in the 'Journal of the Asiatic Society of Bengal,' and in the 'Transactions of the Medical and Physical Society of Calcutta,' numerous valuable botanical papers; but the most important of his Indian publications

are contained in the 'Calcutta Journal of Natural History,' edited jointly by Mr. MacClelland and himself. Of these it may be sufficient at present to refer to his memoir "On *Azolla* and *Salvinia*," two very remarkable plants which he has most elaborately illustrated, and in relation to which he has entered into some very curious speculations; and his still unfinished monograph of "The Palms of British India," which promises to be a highly important contribution to our knowledge of a group hitherto almost a sealed book to European botanists.

But the great object of his life, that for which all his other labours were but a preparation, was the publication of a General Scientific Flora of India, a task of immense extent, labour and importance. To the acquisition of materials for this task, in the shape of collections, dissections, drawings and descriptions, made under the most favourable circumstances, he had devoted twelve years of unremitting exertion. His own collections (not including those formed in Cabool and the neighbouring countries) he estimated at 2500 species from the Khasiya Hills, 2000 from the Tenasserim provinces, 1000 from the province of Assam, 1200 from the Himalaya range in the Mishmee country, 1700 from the same great range in the country of Bootan, 1000 from the neighbourhood of Calcutta, and 1200 from the Naga Hills at the extreme east of Upper Assam, from the valley of Hookhoong, the district of Mogam, and from the tract of the Irawaddi between Mogam and Ava. Even after making large deductions from the sum-total of these numbers on account of the forms common to two or more of the collections, the amount of materials thus brought together by one man must be regarded as enormous. The time was approaching when he believed that he could render these vast collections subservient to the great end which he had in view. He had some time since issued an invitation to many eminent botanists in Europe to co-operate with him in the elaboration of particular families; and he purposed after a few years' additional residence in India to return to England with all his materials, and to occupy himself in giving to the world the results of his unwearied labours. But this purpose was not destined to be fulfilled, his collections have passed by his directions into the hands of the East India Company, and there can be no doubt, from the well-known liberality of the Directors, which this Society in particular has so often experienced, that they will be so disposed of by that enlightened body as to fulfil at once the demands of science and the last wishes of the faithful and devoted servant by whom they were formed. It is hoped too that the most important of his unpublished materials, both in

drawings and manuscripts, will be given to the world in a manner worthy of the author and of the rank in science which he filled.

John Lewis Guillemard, Esq.,^{F. L. S.} was well known to this Society as a very amiable and worthy man, who took considerable interest in the pursuits of science. In early life he resided in America, and was chosen as their umpire by the British and American Commissioners for the arrangement of the debts due by American citizens to British subjects. He died at his house in Gower-street in December last at a very advanced age.

Robert Hills, Esq., was an artist of great and original talent, especially in the delineation of deer and antelopes; and some of his labours in this department of his art have ornamented our own Transactions and those of the Zoological Society.

Joseph Hurlock, Esq.

Sir John Jamison, M.D.

John Leonard Knapp, Esq., one of the oldest Fellows of the Society, was born at Shenley in Buckinghamshire, of which parish his father, the Rev. Primatt Knapp, was rector, on the 9th of May 1767. He was educated at the grammar-school of Thame in Oxfordshire, but being destined for the navy, left school at an early age. The sea, however, disagreeing with his health, he left the navy and afterwards served both in the Hereford and Northampton Militia, in the latter of which he commanded a troop. Previous to the death of his father he resided principally at Powick near Worcester, from which place he usually made botanical excursions during the summer months, one of which extended into Scotland, where, in company with the late Mr. George Don, he collected several of the rarer grasses figured in his 'Gramina Britannica, or Representations of the British Grasses, with Remarks and occasional Descriptions,' published in 4to in 1804. This volume contains coloured figures of 119 species or remarkable varieties; and offers many useful observations on the agricultural and other properties of the grasses figured. It was printed by Bensley, and the whole impression, with the exception of 100 copies in the hands of the binder, was destroyed by the fire which consumed the establishment of that printer soon after its completion. To this accident Mr. Knapp alludes in a poem, entitled "Progress of a Naturalist," printed at the end of the third edition of his 'Journal of a Naturalist,' and in the preface to a new edition of the 'Gramina Britannica,' which he issued in 1842, with little alteration of the original text and no addition of species.

In 1818 Mr. Knapp published anonymously a poem in 8vo, entitled "Arthur, or the Pastor of the Village," and between 1820 and

1830 he contributed a series of articles called "The Naturalist's Diary" to 'Time's Telescope.' In 1829 he also published without his name a little work entitled 'The Journal of a Naturalist,' which gives a pleasing idea of the pursuits by which a country gentleman imbued with a taste for natural history may amuse his leisure. Of this work a second and a third edition have since appeared.

In 1804 he married Lydia Frances, the daughter of Arthur Freeman, Esq., of Antigua, by whom he had seven children, three only of whom, two sons and a daughter, survive. Shortly afterwards he took up his residence at Llanfoist near Abergavenny, where he continued until 1813, when he removed to Alveston in the neighbourhood of Bristol, at which place he died on the 29th of April in the present year. His latter years were spent almost entirely in the pursuit of his favourite study of natural history and in the cultivation of his garden. His unpublished drawings of British *Fungi* occupy five 4to volumes. He became a Fellow of the Linnean Society in the year 1796, and was also a Fellow of the Society of Antiquaries.

The Earl of Mountnorris (more generally known by the title of his youth, *Lord Valentia*) was born at Arley Castle, Staffordshire, on the 7th of December 1770, and educated at Oxford. In 1789 he visited France and Germany; and in 1802, accompanied by Mr. Salt as his draughtsman and secretary, he commenced the interesting journey, of which he subsequently published an account, in three volumes 4to, under the title of 'Voyages and Travels in India, the Red Sea, Abyssinia and Egypt,' 1802-6. He sat for a short time in parliament, and succeeded to the earldom on the death of his father in 1816. His own death took place at the seat of his birth on the 23rd of July last, in the 74th year of his age.

His lordship became a Fellow of the Linnean Society in 1796, and of the Royal Society also in the same year. During his travels he paid some attention to natural history and made a small botanical collection.

The Marquis of Sligo.

John Smirnové, Esq. $\frac{F}{2}, \frac{S}{5}$.

John Wedgewood, Esq., of Seabridge, Staffordshire, was conversant with various branches of natural history, and especially botany. He was also much attached to chemistry and horticulture, and contributed several papers to the 'Transactions of the Horticultural Society,' and the 'Gardener's Chronicle.' Mr. Wedgewood was held in great esteem as a man of high moral worth and amiable and generous disposition. He was born about March 1766, and died on the 26th of January 1844.

The Society has also lost by death three of its *Foreign Members*.

Richard Harlan, M.D., was of Quaker parentage and born in the city of Philadelphia about the year 1795. He studied medicine under Dr. Joseph Parrish, one of the surgeons of the Pennsylvania Hospital, whose anatomical assistant he became, dissecting extensively himself and directing the dissections of the younger pupils. In 1817, at which time he was settled in practice, he had already commenced the study of comparative anatomy with zeal and success; and there is reason to believe that his devotion to natural history interfered greatly with the brilliant prospect that was opened to him as a medical practitioner. But he had made his choice, and was quite prepared to sacrifice fortune and professional eminence to his favourite pursuit. As early as 1819 he delivered a course of lectures on Comparative Anatomy at the Philadelphia Museum (Peale's), where he had amassed a considerable stock of materials for demonstration, but the attendance was small, and he gave up lecturing in disappointment.

About this period the return of MacLure to the United States, accompanied by Lesueur, gave a new stimulus to the cultivation of natural history, and the complete establishment of the Academy of Natural Sciences of Philadelphia under the Presidency of MacLure brought together the most distinguished names in the science that America had produced. Among Dr. Harlan's claims to remembrance, not the least are derived from his zeal in the early constitution of this Society, and from his example of sedulous devotion to its pursuits. To the pages of its Journal he contributed numerous valuable papers.

In 1825 he published his 'Fauna Americana; being a Description of the Mammiferous Animals inhabiting North America,' a work partly compiled from Desmarest's 'Mammalogie' and from other less-known publications, but containing in addition much useful original matter.

In 1832, when the Asiatic cholera made its first appearance at Quebec and Montreal, considerable apprehension was excited in the public mind, and Dr. Harlan was appointed by the City Councils of Philadelphia one of a Commission of three, consisting of himself, Dr. Jackson and Dr. Meigs, to proceed to Canada, "to inquire into the origin, nature, progress, &c. of the prevailing epidemic." After making extensive inquiries, the Commission returned to Philadelphia with such a mass of information on the subject as enabled them to give to the people of that city ample warning of the nature of the premonitory symptoms and of the precautions to be adopted, and thereby greatly

to mitigate the severity of the disease and to reduce the number of its victims. For his tripartite share in this service Dr. Harlan received a handsome gratuity from the municipal authorities, together with a piece of silver plate bearing an inscription in record of its object; and he was also appointed to the charge of one of the local hospitals, in the conduct of which he was most successful.

He subsequently married the daughter of a Quaker merchant in Philadelphia, by whom he had several children. His first visit to England was made about this time; but he afterwards returned to Europe with the design of establishing himself in practice in Paris. In this object, however, he was disappointed, and he once more sought refuge in his native city. Here again he was doomed to disappointment, and he was at length led to believe that a better chance of success was opened for him at New Orleans, in which city he fell a victim to disease when there was just reason for thinking that he was on the point of meeting with that success which his talents and acquirements so well deserved. He became suddenly hemiplegic, and died in the course of a few days from the time of his attack in the autumn or late summer of 1844.

He was elected a Foreign Member of the Linnean Society in 1835; and in the same year he collected his various scattered memoirs into an 8vo volume, entitled 'Medical and Physical Researches; or Original Memoirs in Medicine, Surgery, Physiology, Geology, Zoology and Comparative Anatomy.' The greater part of this volume consists of papers previously published; but it also contains several not before given to the world. Those relating to natural history occupy a very considerable portion of the work, and contain much valuable information.

Etienne Geoffroy St. Hilaire was born at Étampes on the 15th of April 1772, and destined for the ecclesiastical profession; but an early introduction to Haüy, whose pupil he became, entirely changed the character of his pursuits, and for a time he gave himself up almost entirely to the study of mineralogy. When, in consequence of the events of the 10th of August 1792, Haüy was thrown into prison, and placed, in common with so many others, in extreme peril of his life, young Geoffroy ardently exerted himself to procure the liberation of his teacher, which he succeeded in accomplishing, and was repaid for his exertions by the zealous friendship of the great mineralogist. On the warm recommendation of Haüy, Daubenton procured for him on the 13th of March 1793 the appointment of Assistant Keeper and Demonstrator of the Museum of Natural History,

vacated by the resignation of Lacépède ; and on the 10th of June in the same year, when the *Jardin des Plantes* was re-organized in conformity with a decree of the Convention, Geoffroy, then only 21 years old, was appointed to the Professorship of Zoology for the Vertebrated Animals, the duties of which he afterwards shared with Lacépède. From this period he devoted his whole attention to zoology, and several valuable papers which he published in the ' *Décade Philosophique* ' and ' *Magazin Encyclopédique* ' attest the rapidity of his progress in his new pursuit.

In 1798 he was appointed one of the scientific Commission which accompanied the French army into Egypt, and whose labours have added so much celebrity to that expedition. Of these labours M. Geoffroy contributed an important share, and to his firmness science in all probability owes their preservation. When the French army were about to evacuate the country, the papers and drawings belonging to the Commission were demanded by the English general ; but a resolute intimation of their determination to commit the whole to the flames, if the demand were persisted in, delivered through the mouth of M. Geoffroy, had its proper effect—Lord Hutchinson withdrew his orders, and the Commission were left in possession of the fruits of their researches.

On his return to Paris from this expedition M. Geoffroy resumed his lectures at the *Jardin des Plantes*, and occupied himself assiduously in adding to the zoological collections of the museum and in improving their arrangement. He was elected a Member of the Institute in 1807 ; and in 1810 was again despatched on a mission to Portugal. After encountering great dangers on his road through Spain, arising from the excited state of the country, he arrived in Portugal, where he succeeded in accumulating large collections of minerals and animals, chiefly obtained from the cabinets of the Palace of Ajuda and of the Academy of Lisbon. In pursuance of the capitulation for the evacuation of Portugal by the French, the restoration of these collections was demanded by General Beresford and Lord Proby ; but M. Geoffroy claiming them as his private property, and the conservators of the collections from which they were obtained declaring that they had been given to him in exchange for other specimens and in return for services, he was suffered to retain them, and in 1815 they were not reclaimed by Portugal. In this last-named year M. Geoffroy was elected Member of the Chamber of Deputies for his native town. He had been a Member of the Legion of Honour from the establishment of the order ; and became gra-

dually associated with a large number of scientific Societies throughout the world. His election as a Foreign Member of the Linnean Society took place in 1824, and he died on the 19th of June 1844.

A mere list of his zoological writings would occupy a considerable space. Besides a number of important papers in the 'Annales' and 'Mémoires du Muséum d'Histoire Naturelle,' in the 'Bulletin de la Société Philomathique,' in the 'Annales des Sciences Naturelles,' in the 'Dictionnaire des Sciences Naturelles,' and in other scientific miscellanies, he published separately several works which have contributed in no small degree to the progress of zoological and anatomical science. Among these the most important is his 'Philosophie Anatomique,' in two vols., published in 1818 and 1823; the first entitled 'Des Organes Respiratoires sous le rapport de la détermination et de l'identité de leurs pièces osseuses,' the second 'Des Monstruosités Humaines.' In this work he endeavours to demonstrate throughout the animal kingdom a uniform plan of organization, recognizable by the existence, not of the same organs, but of the materials of the same organs in all. From the period of the publication of his 'Philosophie Anatomique,' this "unity of composition" became the leading idea of all his writings. It was the subject of a lengthened discussion between him and Cuvier; and presides over his 'Système Dentaire des Mammifères et des Oiseaux,' published in 1824, his 'Considérations Générales sur les Monstres,' in 1826, his 'Cours de l'Histoire Naturelle des Mammifères,' of which only one volume appeared in 1829, as well as over numerous notes and memoirs on the structure of *Marsupialia* and *Monotremata*, published at various times. To him, conjointly with Cuvier, France is indebted for the elevated position in zoology which she has occupied for the last half century. Following up with equal zeal and success the career of anatomical investigation opened for them by Daubenton, Vicq d'Azyr and others, and adding to the habits of minute investigation of those excellent observers a spirit of philosophical generalization, these two great zoologists created a school in which the study assumed a really scientific character. From this school have emanated the most valuable contributions that zoology has received in our times, and it will long continue to exercise a salutary influence over the labours of succeeding generations.

Karl Bernhard von Trinius was born at Eisleben on the 7th of March 1778. He devoted himself at an early age to the study of botany, and especially of the grasses, on which he published numerous highly important works. Of these the principal separate publications are: 'Fundamenta Agrostographiæ, sive Theoria construc-

tionis Floris Graminei, adjectâ Synopsi Generum Graminum hucusque cognitorum,' 8vo, Viennæ, 1820; 'Clavis Agrostographiæ Antiquioris,' Coburgi, 1822; 'De Graminibus unifloris et sesquifloris Dissertatio Botanica,' 8vo, Petropoli, 1824; and 'Species Graminum Iconibus et Descriptionibus illustratæ,' in three vols. folio, Petropoli, 1828, 1829 and 1836. His contributions on the same subject to the Memoirs of the Academy of St. Petersburg were numerous and important, including a revision of the genera and species of *Panicææ* in the restricted sense of that tribe, of *Stipeæ*, of *Bambuseæ*, &c.

In these works he propounded a theory of the structure of the gramineous flower, which although supported with much ingenuity, has met with little acceptance among botanists. But his systematic labours on the family have contributed in no small degree to its elucidation, and his patient and elaborate investigations will ensure him a distinguished position among that valuable class of observers who devote themselves to the study of a single family of large extent.

M. Trinius had long been resident at St. Petersburg, where he became a Corresponding Member of the Academy in 1810, and an Effective Member in 1823. He was also for many years Director, as indeed he was in a great degree the founder, of the Botanical Museum; with which in 1843 he incorporated his own collection of grasses, estimated by M. Meyer to contain from 35,000 to 40,000 specimens belonging to 5000 species. These numbers may well be regarded as enormous, when we reflect that M. Kunth's Enumeration of the family, including a great number of doubtful species, scarcely exceeds 3000. With such vast resources at his disposal, we may expect from M. Ruprecht, who has been associated with M. Trinius in several of his later memoirs, and who has attached himself particularly to the study of the Grasses, large contributions to our knowledge of this important family.

M. Trinius was, as we are informed, an intimate friend of Chamisso, and like him mingled a genius for poetry with his botanical pursuits. He was admired for his varied accomplishments and for his depth of intellect, and loved for his amiable disposition and agreeable manners. He died at St. Petersburg on the 12th of March 1844.

And lastly we have to lament the death of one Associate.

Thomas Charles Hope, M.D., F.R.S., V.P.R.S.E. &c., Professor of Chemistry in the University of Edinburgh, was the son of Dr. John Hope, for many years Professor of Botany in the same University, and was born at Edinburgh on the 21st of July 1766. On the death of his father in 1786 he became a candidate for the vacant chair, but

failed in obtaining it, and then directed his attention towards chemistry, on which he was appointed Lecturer at Glasgow in the following year. He continued at Glasgow until 1795, in which year he delivered a course in Edinburgh conjointly with Black, whose decaying health allowed him only to deliver the lectures on Caloric. In the year 1796 he succeeded Black in the Chemical Chair in the University of Edinburgh, which he continued to fill for nearly half a century. During the whole of this lengthened period he maintained the character of a most popular and able lecturer, and obtained a high reputation in chemical science, without individually contributing much to its progress.

His earliest contribution to the Transactions of the Royal Society of Edinburgh was "An Account of a Mineral from Strontian, and of a peculiar species of Earth which it contains," published in the third and fourth volumes. But his most important researches were on the subject of Heat, and on the Phænomena of Freezing, an object which occupied his attention almost to the period of his death, his last communication to the Royal Society of Edinburgh, read on the 1st of May 1843, being "An Attempt to explain the Phænomena of the Freezing-cavern at Orenburg." On the 3rd of April in the same year he had laid before the same Society a paper entitled "Chemical Observations on the Flowers of the *Camellia Japonica*, *Magnolia grandiflora* and *Chrysanthemum Leucanthemum*; and on three proximate principles which they contain," thus connecting his later chemical with his earlier botanical pursuits.

Dr. Hope was the oldest surviving Member of the Linnean Society, having been elected an Associate on the 18th of March 1788. In the same year he was elected a Fellow of the Royal Society of Edinburgh, and in 1810 of the Royal Society of London. In 1843, he found himself unequal to the continuance of his lectures, which were delivered for him by Dr. Traill, and he shortly afterwards resigned the Chemical Chair. He died on the 13th of June 1844, having nearly completed his 78th year.

The Secretary also announced that 16 Fellows, 3 Foreign Members, and 1 Associate had been elected since the last Anniversary.

At the election which subsequently took place, the Lord Bishop of Norwich was re-elected President; Edward Forster, Esq., Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out: viz. C. C. Babington, Esq., Secretary of the Cambridge Philosophical Society; Thomas Bell,

Esq., Professor of Zoology in King's College, London ; Bracy Clark, Esq. ; Edwin John Quekett, Esq. ; and Richard Horsman Solly, Esq.

June 3.

Edward Forster, Esq., V.P., in the Chair.

Read a paper entitled " Descriptions of some unpublished species of Plants from North-Western India." By M. Pakenham Edgeworth, Esq., F.L.S., Bengal Civil Service.

This paper contains characters and descriptions of 142 species of Phænogamous plants presumed to be new to science. Several are described as forming new genera, which are characterized as follows :—

Ord. UMBELLIFERÆ.

Trib. AMMINEÆ.

Gen. *Acronema*, Falc. MSS.

Calycis margo obsoletus. *Petala* lanceolata, in apiculum filiformem rectum acuminata. *Stylopodium* bifidum, dilatatum. *Styli* divergentes, apice deflexi. *Fructus* subovatus, a latere compressus, subdidymus ; *mericarpia* basi gibba, apice angustata, jugis 5 æqualibus tenuiter filiformibus, omnino evittata ; *carpophorum* liberum, integrum, apice bidentatum. *Semen* teres convexum, antice planiusculum.

A. tenerum.—Sison? tener, *Wall. List* ; Helosciadium? tenerum, *DeC. Prodr.* iv. p. 106.

Gen. *Petrosciadium*.

Calycis limbus obsoletus. *Petala* ovata, integra ; lacinulâ inflexâ. *Fructus* a latere compressus, oblongus, *stylopodio* pulvinato *stylisque* divergentibus reflexis coronatus ; *mericarpia* 5-juga, jugis filiformibus æqualibus, valleculis 1-vittatis, commissurâ bivittatâ ; *carpophorum* bipartitum, adnatum. *Semen* planum, oblongum, basi angustatum.

P. cæspitosum.

Trib. ANGELICEÆ.

Gen. *Oreocome*.

Calycis limbus 5-fidus, laciniis subulatis. *Petala* ovata, apiculo inflexo plus minus emarginato. *Fructus* a dorso compressus, *stylopodio stylisque* reflexis coronatus ; *mericarpia* 5-juga, jugis alatis marginantibus amplis, valleculis univittatis, marginalibus quandoque bivittatis, com-

missurâ 2—4-vittatâ. *Semen* anticè planum, vel subconcauum, dorso sub valleculis sulcatum. *Carpophorum* liberum, bipartitum.

1. *O. elata*, foliis 4—5-pinnatisectis; caulinis superioribus 3-pinnatisectis: pinnis primariis ad vaginæ apicem sessilibus: laciniis inciso-dentatis acutis, involucelli foliolis linearibus, valleculis dorsalibus 1— marginalibus 1—2-vittatis; commissurâ 4-vittatâ, semine anticè plano.
2. *O. filicifolia*, foliis inferioribus 4—5-pinnatisectis; superioribus 3-pinnatisectis: pinnis omnibus petiolatis: segmentis pinnatifidis: lobis angustis lanceolatis acutis mucronatis, involucelli foliolis biformibus lanceolatis pinnatifidisque, valleculis dorsalibus 1— marginalibus 1—2-vittatis; commissurâ 4-vittatâ, semine anticè subconvexo.

To this genus are referable *Selinum Candollii*, DeC. Prodr. iv. p. 165, *Peucedanum Wallichianum*, DeC. Prodr. iv. p. 181, and *Pleurospermum cicutarium* of Royle's Illustrations.

Trib. CAUCALINEÆ.

Gen. *Psammogeton*.

Calycis limbus obsoletus. *Petala* obcordata; lacinulâ ex fissurâ ortâ inflexâ. *Styli* basi conicâ subrecti. *Fructus* teres; *mericarpia* jugis 5 primariis filiformibus setas glochidiatas gerentibus, secundariis simplici serie setosis, valleculis sub jugis secundariis 1-vittatis, commissurâ bivittatâ planâ. *Semen* albumine leviter excavato. *Carpophorum* bipartitum, liberum.

Subord. CÆLOSPERMEÆ.

Gen. *Schaphespermum*.

Calycis margo 5-dentatus, dentibus subulatis caducis. *Petala* obovata integra, apiculo inflexo. *Stylopodium* tumidum, depressum. *Styli* longi, reflexi. *Fructus* subglobosus; *mericarpia* 5-juga, jugis filiformibus æqualibus, valleculis 1-vittatis, commissurâ 2—4-vittatâ; *carpophorum* liberum, bipartitum. *Semen* anticè longitudinaliter concavum, dorso leviter sub valleculis sulcatum.

S. trilobum.

Ord. COMPOSITÆ.

Trib. SERRATULÆ.

Gen. *Stictophyllum*.

Capitulum multiflorum, homogamum. *Involucrum* ovoideum, squamis regulariter imbricatis ex ovato-oblongis exappendiculis. *Receptaculi* fimbriellæ in squamas integras furcatasve setosas productæ. *Corolla* 5-fida, subregularis, fauce sensim ampliata 5-nervi, basi incrassatâ bulbosâ. *Staminum* filamenta papillosa; antheræ appendice acutâ, caudis 2 brevibus sublaceris. *Pollen* globosum, echinulatum. *Stylus* basi bulbosus, coronâ epigynâ denticulatâ ad nodum penicillatus; ramis brevibus extûs puberulis; lineis stigmatosis filiformibus marginantibus. *Achenium* areolâ terminali centrali, basilari laterali, incurvum, angulatum, costatum, glabrum, læve, annulo integro brevi superatum; *pap-*

pus pluriserialis, pilis inæqualibus plumosis basi liberis persistentibus.
—Folia *punctata*.

Ord. COMMELINEÆ.

Gen. *Streptolirion*.

Sepala 6, hyalina, persistentia, exteriora latiora, interiora linearia. *Stamina* 6, perfecta; filamentis supra medium barbatis; antheris bilocularibus, loculis brachiatim divaricatis apice dehiscentibus. *Stylus* erectus; stigmatate capitato, puberulo. *Ovarium* 3-loculare; loculis biovulatis; ovulis ad medium placentæ centralis affixis. *Capsula* chartacea, trilobularis, trivalvis, loculicidè dehiscens. *Semina* in quoque loculo duo superposita, inferius pendulum, superius erectum, angulata, irregulariter rugoso-sulcata; hilo lineari, papillâ (embryostegâ) parvâ depressâ ei oppositâ. *Embryo* testâ sub papillâ productâ latiori circumdatus, in albumine carnosio subfarinaceo excavato nidulans.—Herba *volubilis, habitu et perianthio a Tradescantiâ distinctissima, caractere carpologico maximè affinis.*

S. volubile.

Read a paper entitled “*Caricis species novæ vel minùs cognitæ.*”
By Francis Boott, M.D., F.L.S. &c.

The species described in this paper are eighteen in number, and they are characterized as follows:—

1. *C. ALTA*, spicâ compositâ elongatâ e spiculis basi masculis pluribus oblongis simplicibus: superioribus contiguis alternatis: inferioribus remotiusculis bracteatis, stigmatibus 2, perigyniis parvis ellipticis marginatis ciliato-serratis utrinque nervosis breviter rostratis bidentatis squamam pallidam ovato-acuminatam subæquantibus.

Hab. in Insulâ Java, *Dr. Horsfield.*

Affinis *C. remotæ*, L.

2. *C. SOCIA*, spicis 8 v. 9 cylindricis solitariis geminatisque ferrugineis concoloribus: terminali masculâ breviori erectâ; fœmineis 7 v. 8 apice masculis pendulis: superioribus approximatis geminatis: inferioribus remotis solitariis: omnibus evaginatis bracteatis, stigmatibus 2, perigyniis orbiculatis abruptè brevi-cylindrico-rostratis ore integro enerviis squamâ lanceolatâ acuminato-cuspidatâ lævi brevioribus.

Hab. in Insulâ Ceylon, *Col. Walker (v. in Herb. Hooker).*

Affinis *C. geminatæ*, Schk.

3. *C. ORBICULARIS*, spicis 4 parvis congestis sessilibus ebracteatis; terminali masculâ oblongâ fusco-ferrugineâ; reliquis fœmineis apice masculis ovatis atro-purpureis, stigmatibus 2, perigyniis compressis orbiculatis abruptè rostellatis ore integris enerviis atro-purpureis basi pallidis squamâ lanceolatâ obtusâ nigro-purpureâ concolori vix longioribus triploque latioribus.

Hab. in Indiâ Orientali, *Prof. Royle.*

Affinis *C. saxatili*, L. (*C. pullæ*, Gooden.)

4. *C. PRUINOSA*, spicâ masculâ 1 subclavatâ; fœmineis 4 cylindricis pedunculatis evaginatibus erectis contiguibus; superioribus apice masculis: inferioribus longissimè bracteatis, stigmatibus 2, perigyniis ovatis rostellatis emarginatis obsoletè nervosis albo-tuberculatis squamâ lanceolatâ mucronatâ longioribus latioribusque.

Hab. in Insulâ Java, *Dr. Horsfield.*

C. glaucescenti, Ell. (quæ tamen stigmatibus 3 gaudet) habitu et aspectu similis.

5. *C. SUBDOLA*, spicis 5—7 cylindricis erectis ferrugineo-purpureis solitariis v. geminatis; masculis 1—3: terminali longiore longè pedunculatâ: infimâ cum spicâ supremâ fœmineâ v. androgynâ apice masculâ geminatâ; fœmineis 3—4 strictè erectis solitariis v. supremis geniculatis longissimè bracteatis: superioribus approximatis sessilibus: infimâ plùs minùs remotâ vaginatâ vel radicali basi attenuatâ laxiflorâ longè exsertè pedunculatâ, stigmatibus 2, perigyniis ovalibus rostellatis ore integro stipitatis nervosis stramineis squamâ oblongâ emarginatâ hispido-aristatâ v. muticâ obtusâ ferrugineo-purpureâ nervo lato viridi longioribus latioribusque vel eam subæquantibus.

Hab. in Novâ Zealandiâ, *Dr. J. D. Hooker.*

Primo aspectu *C. Goodenovii*, Gay, similis.

6. *C. DECIDUA*, spicis 4—7 erectis; supremâ masculâ vel androgynâ basi v. apice basi que masculâ; reliquis fœmineis: superioribus sessilibus contiguibus oblongis: inferioribus cylindricis pedunculatis bracteatis evaginatibus rariùs geminatis v. compositis: infimâ interdùm subremotâ, stigmatibus 2, perigyniis oblongo-ovatis rostellatis ore integro utrinque nervosis stipitatis pallidis deciduis squamâ oblongâ obtusâ atro-purpureâ nervo pallido deciduâ longioribus latioribusque.

Hab. in Insulis Falkland, *Dr. J. D. Hooker*; in Fretu Magellanico, Port Famine, *Anderson.*

Habitu *C. Goodenovii*, Gay, affinis.

7. *C. DURA*, spicâ decompositâ e spiculis 7—20 oblongo-ellipticis ferrugineo-purpureis androgynis apice masculis: superioribus simplicibus confertis sessilibus: inferioribus subremotis pedunculatis bracteatis emarginatis basi compositis, stigmatibus 2, perigyniis obovatis rostellatis bidentatis atro-purpureis lucidis enerviis stipitatis squamâ lanceolatâ acutâ apice ciliatâ v. hispido-mucronatâ nervo pallido brevioribus.

Hab. in Columbiâ, Pillylum, ad alt. 13,000 ped., *Jameson* (v. in *Herb. Hooker*).

Aspectus *C. atratæ*, L.

8. *C. Pichinchensis*, spicâ decompositâ e spiculis 20—35 ovatis v. oblongo-cylindraceis inæqualibus fuliginoso-purpureis androgynis apice extremo masculis: supremis 8—12 congestis sessilibus simplicibus: reliquis in spicas primùm simplices deinde deorsùm magis compositas pedunculatas inferiores brevi-bracteatas subnutantes? insidentibus, stigmatibus 2, perigyniis (floriferis) glabris enerviis ovalibus cylindrico-

rostratis bidentatis stipitatis basi pallidis squamâ lanceolatâ acuminatâ acutâ muticâ fuliginoso-purpureâ concolori brevioribus.

C. Pichinchensis, Kunth.

Hab. in montibus Quito, *Humboldt, Jameson*, no. 143 (*v. in Herbb. Hooker et Lemann*).

Affinis *C. Lemannianæ*.

9. *C. LEMANNIANA*, spicâ decompositâ e spiculis 20—40 cylindricis inæqualibus ferrugineo-purpureis androgynis apice extremo masculis: supremis 6—12 congestis sessilibus: reliquis in spicas 4 v. 5 alternas pedunculatas erectas plius minus compositas foliaceo-bracteatas insidentibus, stigmatibus 2, perigyiniis ovalibus brevi-cylindrico-rostratis subbifurcatis stipitatis nervosis viridibus supernè ferrugineo-tinctis ad margines aculeatis squamâ lanceolatâ longè acuminatâ acutâ vel rariùs hispido-mucronatâ purpureo-ferrugineâ nervo pallido subduplò brevioribus.

Hab. in locis humidis Montis ignivomi Cotopaxi Columbiae, *Hartweg*, no. 1446 (*Herb. C. M. Lemann*); Columbia, *Jameson*, no. 220 (*Herb. Lemann*).

Affinis *C. Pichinchensi*, Kth.

10. *C. Mertensii*, spicis 4—10 cylindricis androgynis basi masculis pedunculatis nutantibus approximatis: inferioribus remotis, stigmatibus 3, perigyiniis ovatis acutis rostellatis ore integro tenuissimis compressis binerviis squamâ oblongâ muticâ v. mucronulatâ longioribus latioribusque.

C. Mertensii, *Prescott, Hook. Fl. Bor.-Amer.* t. 217.

C. Columbiana, *Dewey*.

Hab. in Americæ Orâ Boreali-Occidentali, *A. Menzies, Esq.*; ad fl. Columbia, *Dr. Scouler*; in Insulâ Sitcha, *ex Bongard*.

11. *C. CRINALIS*, spicis 3—5 oblongis congestis sessilibus erectis olivaceo-ferrugineis: terminali majore androgynâ basi masculâ: reliquis fœmineis bracteatis evaginatissimis, stigmatibus 3, perigyiniis ellipticis triquetris conico-rostratis bifidis glabris striato-nervosis ferrugineis squamâ æquilatâ ovatâ obtusâ v. acutâ rariùs mucronulatâ longioribus.

Hab. in Columbia prope Antisana, *Hartweg*, no. 1461 (*Herb. Bentham*); Pillylum, *Jameson* (*Herb. Hooker*).

Affinis *C. hirsutæ*, Willd.

12. *C. NIVALIS*, spicis 4 atro-purpureis cuneatis v. ellipticis contiguis; superioribus androgynis basi masculis; infimâ fœmineâ exsertè pedunculatâ subremotâ brevi setaceo-bracteata, stigmatibus 3, perigyiniis ellipticis erostratis bidentatis supernè ad margines scabriusculis enerviis compressis atro-purpureis basi albidis tenuissimis squamâ atro-purpureâ lanceolatâ mucronatâ longioribus latioribusque.

Hab. in Indiâ Orientali, supra Dhunrao, versus fauces Montium Himalensium *Mana* dictas, ad altitudinem 16,000 ped., *M. P. Edgeworth, Esq.*

Facies *C. atratæ*, L.; *C. coriophoræ*, Fisch. affiniore.

13. *C. CINNAMOMEA*, spicis 5 cylindricis nutantibus basi attenuatis ferrugineis concoloribus; terminali androgynâ basi masculâ reliquis fœmineis: superioribus contiguis sessilibus: inferioribus pedunculatis: infimâ remotâ longè exsertè vaginato-bracteatâ basi compositâ, stigmatibus 3, perigyniis ovalibus bidentatis enerviis compressis ferrugineis basi albidis supernè marginibus pallidis scabriusculis squamâ oblongâ acutâ vel cuspidatâ ferrugineâ longioribus latioribusque.

Hab. in Indiâ Orientali, *Prof. Royle*.

C. coriophoræ, Fisch. affinis.

14. *C. BANKSII*, spicis 3—7 oblongis ovatisque crassis atro-purpureis exsertè pedunculatis nutantibus; supremâ basi masculâ; reliquis fœmineis infimâ remotâ, stigmatibus 3 longis, perigyniis hyalino-tenuissimis latè ovatis compressis leviter nervosis cylindrico-rostratis glabris ore obliquo bifido squamâ oblongo-spathulatâ emarginatâ cristatâ brevioribus latioribusque.

C. atrata et *C. Magellanica*, *Herb. Banks*.

Hab. in Terrâ del Fuego, *Banks et Solander* (v. etiam in *Herbb. Henslow et Hooker e cel. Darwin*, sub num. 300 et 301).

15. *C. WALKERI*, spicâ compositâ e spiculis pluribus androgynis apice masculis fasciculatis cylindricis laxifloris inæqualibus exsertè setaceo-pedunculatis, stigmatibus 3, perigyniis angustis triquetro-lanceolatis longè-rostratis bicuspidatis stipitatis nervosis marginibus supernè serrato-scabris squamâ lanceolatâ cristatâ longioribus.

C. Walkeri, *Arnott MSS*.

Hab. in Insulâ Ceylon (*Herb. Arnott*).

C. validæ, Nees proxima.

16. *C. HORSFIELDII*, glaucescens concolor, spicis 4 v. 5 decompositis erectis strictis alternis: inferioribus longè exsertè pedunculatis remotis: terminali majore evaginatâ; spiculis apice masculis oblongis alternis patentibus, stigmatibus 3, perigyniis triquetro-ellipticis acuminato-rostratis bidentatis obliquè fissis arcuatim recurvis nervosis supernè parcè serrato-denticulatis squamâ ovatâ albo-membranacâ hispido-ariatâ nervo viridi scabriusculo longioribus.

Hab. in Insulâ Java, *Dr. Horsfield*.

Affinis *C. polystachyæ*, Willd.

17. *C. LEUCANTHA*, spicâ decompositâ e spiculis parvis androgynis apice masculis; terminalibus et infrâ ad apicem peduncolorum congesto-sessilibus axillaribus; spicis partialibus 4—6 alternis plûs minûs compositis: inferioribus remotis elongatis exsertè pedunculatis: superioribus approximatis abbreviatis sessilibus, stigmatibus 3, perigyniis trigono-ellipticis acuminatis rostratis altè obliquè fissis striato-nervosis scabris squamâ ovatâ hispido-mucronatâ pallidâ nervosâ duplò longioribus.

C. leucantha, *Arnott MSS*.

Hab. ad Courtallum, in Penins. Indiæ Orientalis, *Wight* (*Herb. Wight*,

2379 a, "July 1838, no. 993," *juvenilis*; 2379 b. *var. composita*; "Aug. 1835, no. 992, 998," *senilis*).

18. *C. JAMESONI*, spicis circiter 20 fusco-nigris cylindricis androgynis apice masculis inæqualiter longè pedunculatis bracteatis evaginatissimis pendulis simplicibus compositisque: extremis solitariis: reliquis geminatis ternatisve, stigmatibus 3, perigyniis lanceolatis utrinque nervosis in rostrum breve attenuatis bidentatis glabris atro-purpureis squamâ lanceolatâ hispido-cuspidatâ fusco-nigrâ margine albo-membranaceâ brevioribus angustioribusque.

Hab. in Montibus Columbix, ad altit. 13,000 ped., *Jameson* (*Herb. Hooker*).

Proxima *C. Boryanæ*, Schk.

June 17.

Edward Forster, Esq., V.P., in the Chair.

Read a continuation of Dr. Boott's paper entitled "Caricis species novæ vel minùs cognitæ."

The species now described are fifteen in number, characterized as follows:—

1. *C. GUNNIANA*, spicis 4 v. 5 oblongis v. cylindricis erectis; terminali masculâ sessili; fœmineis 3 v. 4 superioribus sessilibus contiguissimis inferioribus remotis foliaceo-bracteatis exsertè pedunculatis, stigmatibus 3, perigyniis trigono-ellipticis subinflatis acuminato-rostratis bidentatis ad margines supernè scabriusculis stramineis æqualiter utrinque nervosis squamâ latè ovatâ mucronatâ v. hispido-cuspidatâ longioribus.

Hab. in Insulâ Van Diemen, *D. Gunn* (*Herbb. Hooker et Lindley*).

Affinis *C. laxifloræ*, Lam., et *C. lævigatæ*, Smith.

2. *C. COMOSA*, spicis 4 cylindricis densifloris; masculâ 1 erectâ gracili bracteata; fœmineis 3—5 crassis demùm nutantibus v. pendulis longissimè bracteatis: superioribus contiguissimis: infimâ remotâ longiùs pedunculatâ interdùm plùs minùs vaginatâ, stigmatibus 3, perigyniis triquetrolanceolatis longè rostratis altè bicuspidatis: laciniis elongatis patentissimis subrecurvis: stipitatis glabris nervosis demùm divergentibus retroflexisque squamâ lanceolatâ hirsutâ ciliatâ nervosâ longè hispido-aristatâ longioribus.

C. furcata, *Ell.* (*non Lapeyr.*)

C. pseudo-cyperus, *Torr.*, *Dew.* (*non L.*)

Hab. in Georgiâ et Carolinâ, *Elliott*; Ohio, *Sullivant*; Philadelphix et Uticâ, *Torrey*; Boston, *Boott*.

Satis (Elliottio Nuttallioque monentibus) à *C. pseudo-cypero*, L., etiam Americæ Septentrionalis incolâ, distincta.

3. *C. TRIQUETRA*, spicis 3 v. 4; masculâ 1 elliptico-cylindricâ; fœmineis 2 v. 3 approximatis laxis apice masculis: supremâ ovatâ sessili: infimâ cylindricâ basi attenuatâ longè vaginatâ inclusè pedunculatâ, stigmatibus 3, perigyniis ellipticis acutè triquetris pubescentibus bidentatis sub-4-nerviis squamâ ovatâ mucronatâ ferrugineâ margine scariosâ longioribus.

Hab. in Californiâ, *Nuttall*.

Proxima *C. gynobasis*, Vill. (*C. alpestris*, All.)

4. *C. GLOBOSA*, spicis 4—6; masculâ 1 cylindricâ; fœmineis 3—5 ovatis oblongisve erectis evaginatissimis laxè paucifloris: superioribus 1 v. 2 sessilibus masculæ approximatis: inferioribus remotis subradicalibus longè pedunculatis, stigmatibus 3, perigyniis globosis conico-rostratis ore membranaceo obliquo longè stipitatis hirsuto-scabris nervosis squamam lanceolatam mucronatam subæquantibus.

Hab. in Californiâ, *Nuttall*.

Affinis *C. bispicata*, Hook. (*C. longerostrata*, Meyer, *C. camschatcense*, Kunth.)

5. *C. Tweediana*, spicis 8 cylindricis erectis; terminali masculâ simplici; reliquis androgynis apice masculis compositis: superioribus approximatis sessilibus: inferioribus pedunculatis evaginatissimis: infimâ remotâ longissimè exsertè pedunculatâ, stigmatibus 3, perigyniis ovatis acuminatis brevi-rostratis bifurcatis basi abruptè productis quasi stipitatis scabris nervosis stramineis purpureo-maculatis vel olivaceis squamam ovatam pallidam hispido-aristatam trinervem subæquantibus.

C. Tweediana, *Nees in Hook. Journ. Bot.* ii. p. 398.

Hab. ad Buenos Ayres, *Tweedie (Herb. Fielding)*.

Affinis *C. hirtæ*, L., et *C. Houghtonii*, Torr.

6. *C. PALEATA*, spicis 7—10 cylindricis erectis; masculis 2—4 sessilibus contiguis: infimâ bracteata; fœmineis 5—7 remotis foliaceo-bracteatis exsertè pedunculatis, stigmatibus 3, perigyniis triquetro-obovatis brevi-rostratis bifidis apice hispidis nervosis impresso-punctulatis squamam ovatam hyalino-paleaceam hispido-cuspidatam subæquantibus.

Hab. in Insulâ Juan Fernandez, *Dr. Scouler (Herb. Hooker)*.

Affinitas dubia.

7. *C. LANGSDORFFII*, spicis 3 v. 4 oblongis; masculâ 1; fœmineis 2 v. 3 laxifloris bracteatis exsertè pedunculatis: superioribus contiguis: infimâ subremotâ, stigmatibus 3, perigyniis triquetro-fusiflormibus bidentatis nervosis hirtis-scabris squamâ lanceolatâ hispido-cuspidatâ brevioribus.

C. Japonica, *Fisch. in Herb. Boott*.

Hab. in Insulâ Nangasaki Japoniæ, *Langsdorff*. A *C. Japonicâ*, Thunb. (*Schk. Car. t. W.W.*) perigyniis scabris spicisque gracilibus distincta.

8. *C. BONGARDI*, spicis 4 cylindricis erectis alternis stramineo-pallidis concoloribus; masculâ 1 pedunculatâ; fœmineis 3 apice masculis basi attenuatis laxè imbricatis: inferioribus exsertè pedunculatis bracteatis, stigmatibus 3, perigyniis ellipticis stipitatis latè rostratis bicuspidatis supernè serrato-hispidis striato-nervosis squamâ oblongâ emarginatâ hispido-aristatâ brevioribus angustioribusque.

Hab. ad Bonin Insul. Loo Choo, *Bongard*, no. 70 (*Herb. Hooker*).

C. trichocarpæ, Muhl. et affinibus proxima.

9. *C. JACKIANA*, spicâ masculâ 1 oblongo-cylindricâ; fœmineis 4 v. 5: superioribus oblongis contiguis sessilibus: inferioribus vaginatis longè exsertè pedunculatis: infimâ remotissimâ elongatâ laxifloâ interdum compositâ, stigmatibus 3, perigyniis triquetro-lanceolatis acuminatis striato-nervosis emarginatis squamâ ovato-acuminatâ aristatâ longioribus.

Hab. in Insulâ Java, *Dr. Horsfield*.

Habitu et aspectu *C. pubescenti*, Muhl. affinis.

10. *C. Æthiopica*, spicis 4 v. 5 cylindricis erectis castaneis concoloribus; masculâ 1; fœmineis 3 v. 4: superioribus approximatis inclusè reliquis exsertè pedunculatis: infimâ remotâ, stigmatibus 3, perigyniis ovatis triquetris rostratis bifurcatis nervosis sanguineo-maculatis squamâ ovato-lanceolatâ emarginatâ hispido-aristatâ brevioribus angustioribusque vel longioribus.

C. Æthiopica, *Schk. t. Z. f. 83*.

Hab. in Africâ Australi; Caffer-land, *Dr. Gill* (*Herb. Hooker*); Uitenhage, *Zeyher*, no. 684 (*Herb. Hooker*).

11. *C. ARNOTTIANA*, spicis 5 cylindricis erectis contiguis; terminali masculâ; reliquis fœmineis: inferioribus vaginatis insertè pedunculatis: superioribus sessilibus ebracteatis, stigmatibus 3, perigyniis subinflatis ellipticis acuminatis cylindrico-rostratis bidentatis nervosis glabris olivaceo-viridibus squamâ lanceolatâ aristatâ longioribus.

C. Neesiana, *Arnott MSS. (non Endlich.)*—(*Herb. Arnott*).

Hab. in Insulâ Ceylon, *Dr. Wight*, "1836, no. 1295."

Affinitas cum *C. paludosâ*, Gooden.

12. *C. SINAI*, glauca, spicis cylindricis gracilibus erectis; masculâ 1; fœmineis 4 inferioribus remotis exsertè pedunculatis, stigmatibus 3, perigyniis elliptico-lanceolatis triquetris nervosis brevi-rostratis bifidis apice hispidis squamâ ferrugineâ emarginatâ obtusâ mucronatâ longioribus.

C. distans, L. var., *Unio Itin.* no. 176, 1835.

Hab. "in fontanis ad radices Montis Sinai," *Schimper*.

C. dilutæ, Bieb. affinis.

13. *C. ABBREVIATA*, hirsuta, spicis 3 v. 4 oblongis approximatis sessilibus; terminali masculâ; reliquis fœmineis: inferioribus brevi-bracteatis vaginatis, stigmatibus 3, perigyniis trigono-obovatis abruptè brevi-rostratis

ore integro nervosis squamâ ovatâ mucronatâ ferrugineâ margine membranaceâ longioribus.

C. abbreviata, *Prescott MSS.*

Hab. in Sibirîâ Altaicâ (*Herb. Fielding, olim Prescott*).

Proxima C. *striatæ*, Br.

14. C. *GEBLERI*, spicâ masculâ 1 v. 2 cylindricâ; fœmineis 2 v. 1 oblongis v. cylindricis remotis pedunculatis erectis evaginato-bracteatis, stigmatibus 3, perigyniis ovatis brevi latiusculèque rostratis bicuspidatis lucidis nervosis purpureis squamâ ovatâ mucronatâ v. hispido-aristatâ purpureâ margine membranaceâ longioribus.

C. *Gebleri*, *Prescott MSS.*

Hab. in Sibirîâ Altaicâ? *Gebler (Herb. Fielding)*.

C. *rotundatæ*, *Wahlenb. similis*. C. *vesicaria*? *Bunge MSS.* e Chiuâ *Bo-reali* differt solùm perigyniis ellipticis, squamis masculis muticis (v. s. in *Herb. Fielding*).

15. C. *DARWINI*, spicâ masculâ pedunculatâ solitariâ?; fœmineis 6—10 cylindricis elongatis nutantibus remotis foliaceo-bracteatis evaginatis inæqualiter pedunculatis geminatis ternatisque: inferioribus solitariis, stigmatibus 2, perigyniis ellipticis stipitatis nervosis brevi-rostratis ore integro papilloso asperatis squamâ lanceolatâ acuminatâ ferrugineâ latioribus brevioribusque.

Hab. in Archipelago Chonas Americæ Australis, *Darwin*, no. 304 (*Herb. Henslow*).

Read also "Characters of undescribed species of British *Chalcidites*." By Francis Walker, Esq., F.L.S. &c.

The following are the characters of the species described:—

1. *PTEROMALUS ACROTATUS* ♀, viridis, abdomine cupreo, antennis piceis, pedibus fulvis; coxis femoribusque basi viridibus, alis fuscis.—Long. corp. lin. 1; alar. lin. $1\frac{1}{2}$.

Hab. in Scotiâ, prope Lanark, mense Julio.

2. *PTEROMALUS SUNIDES* ♂ et ♀, viridis, abdomine æneo; maris fulvo-maculato, antennis nigris, pedibus maris flavis fœminæ fulvis; femoribus fusco-variis, alis limpidis.—Long. corp. lin. $1\frac{1}{4}$; alar. lin. $1\frac{3}{4}$ —2.

Hab. in Scotiâ, prope Edinam, *Dr. Greville*.

3. *PTEROMALUS ODITES* ♀, cupreus, abdomine basi viridi, antennis piceis, pedibus flavis, alis limpidis.—Long. corp. lin. $1\frac{1}{4}$; alar. lin. 2.

Hab. in Scotiâ, prope Edinam, *Dr. Greville*.

4. *PTEROMALUS BUEARIS* ♀, æneo-viridis, abdomine cupreo, antennis nigris, pedibus fulvis; femoribus fusco-cinctis, alis limpidis.—Long. corp. lin. $\frac{2}{3}$; alar. lin. $1\frac{1}{4}$.

Hab. in Scotiâ, prope Edinam, *Dr. Greville*.

5. *PTEROMALUS NESTOCLES* ♂ et ♀, viridis, abdominis disco æneo vel

cupreo, antennis fuscis piceisve, pedibus fulvis flavisve; femoribus viridibus, alis sublimpidis.—Long. corp. lin. $\frac{2}{3}$ — $\frac{3}{4}$; alar. lin. 1— $1\frac{1}{4}$.

Hab. in Scotiâ, prope Edinam, *Dr. Greville, Rev. G. T. Rudd.*

6. PTEROMALUS CERCIDES ♂ et ♀, viridis, abdomine cupreo, antennis nigris, pedibus fulvis; femoribus viridibus, alis limpidis.—Long. corp. lin. 1; alar. lin. $1\frac{1}{2}$.

Hab. in Cambriâ Boreali, mense Septembri captus.

Fœminæ abdomen ovale subtùs carinatum.

7. PTEROMALUS ECTION ♂, viridis, scutello æneo-viridi, abdomine nigro-cupreo basi fulvo-maculato, pedibus fulvis; femoribus piceis, alis fuscis.—Long. corp. lin. 1; alar. lin. $1\frac{1}{2}$.

Hab. in Scotiâ, prope Edinam, *Dr. Greville.*

8. PTEROMALUS XANTHE ♂, viridis, abdominis disco æneo, antennis piceis, pedibus fulvis; femoribus piceis; tarsis flavis, alis limpidis.—Long. corp. lin. $1\frac{1}{4}$; alar. lin. $1\frac{2}{3}$.

Hab. in Scotiâ, prope Edinam, *Dr. Greville.*

9. PTEROMALUS AOLLIS ♂, viridis, scutello viridi-æneo, antennis fuscis basi viridibus, pedibus fulvis; coxis femoribusque viridibus; tibiis fusco-cinctis, alis limpidis.—Long. corp. lin. $\frac{2}{3}$ — $\frac{3}{4}$; alar. lin. 1— $1\frac{1}{4}$.

Hab. in Cambriâ Boreali, mense Septembri captus.

10. PTEROMALUS ANTHO ♂, viridis, abdomine purpureo, antennis nigris, pedibus piceis; femoribus viridibus, alis sublimpidis.—Long. corp. lin. 1; alar. lin. $1\frac{2}{3}$.

Hab. in Angliâ, *Rev. G. T. Rudd.*

11. PTEROMALUS LEARCHUS ♂, viridis, abdomine æneo-viridi, antennis fulvis basi flavis apice piceis, pedibus flavis, alis limpidis.—Long. corp. lin. $\frac{1}{2}$; alar. lin. $\frac{3}{4}$.

Hab. in Scotiâ, prope Edinam, *Dr. Greville.*

12. PTEROMALUS ANTORIDES ♂, viridis, abdomine purpureo flavo-maculato, antennis fuscis, pedibus flavis, alis limpidis.—Long. corp. lin. $1\frac{1}{4}$; alar. lin. 2.

Hab. in Angliâ, *Rev. G. T. Rudd.*

13. PTEROMALUS SARAVUS ♂, viridis, abdomine cyaneo-viridi disco cupreo, antennis piceis, pedibus flavis; femoribus viridibus, alis limpidis.—Long. corp. lin. $1\frac{1}{4}$; alar. lin. 2.

Hab. ———, ex Musæo *Rev. G. T. Rudd.*

14. PTEROMALUS ANAXENOR ♀, viridis, abdominis disco cyaneo-viridi, antennis nigris, pedibus fulvis fusco cinctis; tarsis flavis, alis limpidis.—Long. corp. lin. $1\frac{2}{3}$; alar. lin. 3.

Hab. ———, ex Musæo *Rev. G. T. Rudd.*

15. PTEROMALUS TEDANIUS ♀, viridis, abdomine basi fulvo, antennis piceis, pedibus flavis, alis subfulvis.—Long. corp. lin. 1; alar. lin. $1\frac{2}{3}$.

Hab. ———, ex Musæo *Rev. G. T. Rudd.*

16. *PTEROMALUS AMYNTOR* ♀, aureo-viridis, capite viridi, abdomine cyaneo-viridi fasciis cupreis, antennis ferrugineis, pedibus flavis; femoribus viridibus, alis limpidis.—Long. corp. lin. 1; alar. lin. $1\frac{3}{4}$.

Hab. ———, ex Musæo Rev. G. T. Rudd.

17. *PTEROMALUS NAUBOLUS* ♀, viridis, abdominis disco cupreo, antennis piceis, pedibus flavis; femoribus viridibus, alis limpidis.—Long. corp. lin. $1-1\frac{1}{4}$; alar. lin. $1\frac{3}{4}-2$.

Hab. ———, ex Musæo Rev. G. T. Rudd.

18. *PTEROMALUS AGLAUS* ♂, viridis, abdomine cupreo basi viridi, antennis piccis, pedibus fulvis; femoribus fusco cinctis, alis limpidis.—Long. corp. lin. $\frac{2}{3}$; alar. lin. 1.

Hab. prope Londinum, mense Julio.

19. *PTEROMALUS URGO* ♀, cyaneo-viridis, abdominis segmentis basi purpureis, antennis piceis, pedibus flavis; femoribus viridibus, alis limpidis.—Long. corp. lin. $1\frac{1}{4}$; alar. lin. $1\frac{3}{4}$.

Hab. ———, ex Musæo Rev. G. T. Rudd.

20. *PTEROMALUS ORINUS* ♀, viridis, abdomine cupreo basi viridi, antennis fuscis, pedibus fulvis; femoribus viridibus, alis limpidis.—Long. corp. lin. $\frac{2}{3}$; alar. lin. $1\frac{1}{4}$.

Hab. prope Londinum.

21. *SCLADERMA LALAGE* ♀, viridis, abdomine cyaneo, antennis nigris, pedibus fulvis; femoribus viridibus; tibiis tarsisque apice fuscis, alis sublimpidis.—Long. corp. lin. $1\frac{1}{4}$; alar. lin. $2\frac{1}{2}$.

Hab. in Scotiâ, prope Edinam, Dr. Greville.

Read also a continuation of Dr. J. D. Hooker's Enumeration of the Plants of the Galapagos Islands.

November 4.

The Lord Bishop of Norwich, President, in the Chair.

Read a memoir "On the *Ambrosinia ciliata* of Roxburgh." By the late William Griffith, Esq., F.L.S. &c. Communicated by R. H. Solly, Esq., F.R.S., L.S. &c.

In this paper, written at Calcutta in the year 1835, Mr. Griffith enters into a lengthened examination of the characters and development of the singular plant above named, to which he states his attention to have been first directed by Dr. Wallich, who was pre-

vously acquainted with many parts of its structure. It forms, in conjunction with *Ambrosinia spiralis*, *retrospiralis* and *unilocularis* of Roxburgh, a genus of *Aroideæ*, for which Mr. Griffith regrets his inability to adopt the highly appropriate name of *Myrioblastus* proposed by Dr. Wallich, inasmuch as M. Fischer had previously proposed the generic name of *Cryptocoryne* for the *Ambr. ciliata* and *spiralis* of Roxburgh, together with *Caladium ovatum*, Vent., in which latter, however, the structure of the fruit, as described by Rheede, appears to be somewhat different.

The following are the amended characters of the genus, proposed by Mr. Griffith:—

CRYPTOCORYNE, *Fisch. in Schott and Endl. Mel. Bot. fasc. 1. p. 6.*

Spatha tubo brevi ad apicem septo obliquo incompleto semipartitò; limbo elongato. *Spadix* basin versus ovariiis cincta, medio filiformis nuda, suprâ antherifera, apice conico nudo calloso spathæ septo pilei instar tecto. *Antheræ* biloculares, transversim dehiscentes. *Glandulæ* nullæ. *Ovaria* 5—7, coalita; *styli* nulli; *stigmata* 5—7, obliqua. *Fructus* nudus, 5—7-locularis (in unicâ specie 1-locularis); dehiscentiâ septiciidâ. *Semina* indefinita, adscendentia; testâ cellulosâ, tenuissimâ. *Albumen* nullum. *Plumula* polyphylla, hilo subopposita.

Obs. Character ex *Crypt. ciliatâ* omninò excerptus.

Crypt. ciliata, foliis oblongo-lanceolatis, spathæ limbo tubuloso-convoluto apice dilatato oblongo-lanceolato ciliato.

Crypt. ciliata, *Fisch. l. c.*

Ambrosinia ciliata, *Roxb. Corom. Pl. t. 262. Fl. Indica, iii. p. 491.*

Hab. ad ripas limosas fluminis Hooghly æstibus alternis ferè omninò submersa. Floret fructusque fert per totum ferè annum.

After a detailed description of the plant, and an indication of the errors into which Roxburgh and those who have followed him had fallen with reference to it, Mr. Griffith proceeds to trace the more remarkable anomalies from their origin through their various stages of development, with the view of reducing them to the ordinary type.

The anthers, he states, may from a very early period be compared to two cups joined together by their contiguous margins, the wide and open mouth which they present in their mature state being originally closed by an extremely fine membrane, which also lines the cavity of the cup, in the interior of which the pollen is formed. As the anther enlarges this membrane assumes the form of a gradually lengthening cone, which at length becomes subulate and perforated at the apex. But this opening appears to be insufficient for the escape of the grains of pollen, and the membrane finally separates

from the edges of cup-shaped theca, leaving the grains of pollen free and uncovered. The agency of insects appears, however, to be generally resorted to to ensure fecundation, the lower portion of the spatha being found during impregnation to contain many small flies, which have perished from inability to escape after the performance of their important duty.

The *ovula*, at the earliest period of observation, are described as oblong bodies, having, a little below their points, a slight constriction, above which they are papilliform. At a somewhat later period the base of the papilliform nucleus is surrounded by an annulus, which Mr. Griffith describes as a growth from that part of the ovulum situated below the constriction, and which is the rudiment of the integument of the ovulum: it soon increases and forms a sort of cup, beyond which the nucleus at first projects considerably. This Mr. Griffith regards as a good example of the correctness of Mr. Brown's opinion as to the comparatively late origin of the integuments in the generality of *ovula*. As the development proceeds the nucleus becomes entirely enclosed in the cup, the mouth of which is gradually narrowed. After impregnation, the period of which is marked by the withering of the spatha, the centre of the nucleus becomes more transparent, and is evidently excavated. The foramen is still visible, but soon afterwards becomes indistinct. The cavity of the nucleus gradually extends upwards to near the apex of that body and downwards towards the hilum; its lower portion is occupied by cellular tissue, assuming the form of a sac, and quite free from adhesion inferiorly; while the upper third contains an oblong cellular body with a conical apex, which constitutes the rudimentary embryo. A little later, the conical, originally rectilinear apex of the embryo has become somewhat oblique, and a depressed areola makes its appearance on one side of the head of the embryo. In the next stage the conical and rather oblique apex of the embryo protrudes through the apex of the nucleus, and its base has become enlarged and roundish. The conical apex and head of the embryo become still further protruded, and from the margin of the depressed areola are produced minute, oblong, obtuse, cellular bodies, which are the rudiments of the outer processes of the plumula. These gradually enlarge, and others are developed within them from the centre or disc of the areola; and at the same time the conical apex of the embryo becomes more and more oblique. At this period the chief bulk and enclosed part of the embryo occupies about the upper two-thirds of the excavation of the nucleus, but does not as yet extend into its lower globular portion; and the enclosed part is firmly

embraced by the neck of the nucleus, the tissue of which has become more and more callous or indurated. Still later the testa becomes more enlarged and cellular, and its foramen more indistinct; the nucleus is denser and more cellular, and the embryo extends downwards into the globular portion of its cavity, displacing the sacci-form cellular tissue with which it was previously filled. The exerted portion of the embryo now ceases to elongate, but increases greatly in a transverse direction; the area on which the processes of the plumula are developed is much enlarged, they become more numerous and elongate rapidly, and, as the testa does not increase with equal rapidity, their apices become recurved. The radicle increases much less rapidly, but becomes gradually more and more oblique, and is soon imbedded in the lax testa, which it finally perforates.

The fully-developed seed is oblong, somewhat compressed, depressed on its inner, convex on its outer surface, and constricted towards the hilum, where it is of a brownish tint and hard to the touch. The testa closely embraces the plumula; it is cellular towards its base and where it surrounds the dense internal globular body, membranous throughout the rest of its extent, and so thin that the processes of the plumula are visible through it and give it a greenish tint. The descending portion of the embryo, which constitutes the cotyledon, is clavate and nearly enclosed within the dense indurated nucleus, the enclosed part separating with the nucleus with great readiness, and about the time of the dehiscence of the fruit spontaneously. The exerted portion of the embryo consists, exclusively of the base of the cotyledon, of a fleshy plano-convex body, the plane surface of which is depressed towards the centre, where the cotyledon is attached, and gives origin on one side to the conical and acute radicle, which is always directed away from the placenta. The circumference of the convex surface is entirely occupied by the processes which constitute the plumula, and the outermost of which are about an inch in length. These processes are furnished with vessels, but their chief bulk is cellular, and they are (with the exception perhaps of the outermost) furnished with stomata. After the spontaneous separation of the enclosed portion of the cotyledon, the testa is frequently found ruptured, but Mr. Griffith does not concur with Roxburgh in regarding this as the stage of germination, which he thinks cannot be said to take place until the radicle has elongated and the innermost of the plumular processes become expanded. The axis contains the rudiments of additional radicles, which after germination become exerted.

Mr. Griffith thinks that the whole of the anomalies existing in the structure of the embryo may be referred to the density of the texture of the nucleus and to the shape of its cavity. The direction of the radicle appears at first sight to be an exception to a very general rule; but this anomaly is proved to take place subsequently to the earlier stages of development, during which the apex of the radicle corresponds exactly with the apex of the nucleus and with the foramen. He adds in a note that he would limit the expression of the law to "radicle pointing or corresponding to the apex of the nucleus," since there are exceptions to its correspondence with the foramen.

The perforation of the testa by the radicle is explained by the anomalous direction of the radicle in the later period of its development; and the separation of the chief part of the cotyledon by the constriction exercised upon it by the indurated apex of the nucleus. Mr. Griffith is inclined to believe from this and some other instances that there is no *absolute* necessity for a cotyledon, but that its presence may be supplied by a highly developed plumula; the enormous development of the plumula in the present case being evidently adapted to correct what would otherwise be a destructive anomaly.

Finally, the author adduces the examination of this plant as a striking proof of the advantages to be derived from tracing anomalous forms back to the earliest period of their development. Going back to the period immediately before the conical apex of the radicle projects through that of the nucleus, we arrive at a stage when the form of the embryo closely resembles the usual form of the *Aroidea*, since we have a superior radicle, a cotyledon, and a tendency to the formation of a lateral slit, as indicated by the depressed areola.

November 18.

The Lord Bishop of Norwich, President, in the Chair.

Dr. Lankester exhibited specimens of a *Fucus* sold in the London shops under the name of "Australian Moss," of which he also furnished a brief notice. On referring to Sir W. J. Hooker, Dr. Lankester obtained for it the name of *F. striatus*, Turn.; but a comparison with a specimen in the Linnean Herbarium marked *F. striatus*

by Mr. Turner himself, and with Mr. Turner's description in the 'Historia Fucorum,' has induced Dr. Lankester to regard the Australian moss as distinct. He believes it to agree better with *F. spinosus*, L. It is brought from Swan River, where it grows on rocks washed by the sea, and is composed principally of Lichenin, a form of starch which also constitutes the bulk of such gelatinous plants as Iceland Moss, Carrageen Moss, Ceylon Moss, and the *Gelidium* used by the *Hirundo esculenta* in the formation of its nest. Its dietetical and medicinal qualities strongly resemble those of the Carrageen Moss (*Chondrus crispus*, Lyngb.).

Read a paper "On the Natural History, Development, and Anatomy of the Oil Beetle, *Meloë*, more especially *Meloë cicatricosus*, Leach." By George Newport, Fellow of the Royal College of Surgeons, &c. Communicated by the Secretary.

Mr. Newport commences his paper with the remark, that although the genus *Meloë* includes some of the most common insects, scarcely anything has yet been ascertained respecting their œconomy, which, hitherto, has remained one of the most difficult unsolved problems in the natural history of the *Articulata*. Many naturalists, more particularly Goedart, Frisch and DeGeer, have well described the perfect insect, and have even given detailed observations on the oviposition of the female and the early stage of the larva, but they have invariably failed to carry their inquiries further, and have been quite unacquainted with the adult larva and the nymph, as well as with the early stage of the imago. This deficiency in our knowledge of the history of these common insects is attributed to two causes—first, the anomalous habits of the insect in its earliest stages; and secondly, the little credit that has been given to the statements of former observers, whose accounts Mr. Newport verifies in almost every particular.

Mr. Newport commenced his observations on the habits of *Meloë* about fifteen years ago; but although he succeeded at that time in rearing the larva from the egg, as had been done by Goedart and DeGeer, and soon afterwards obtained the full-grown larva, the nymph and the imago, before it left its cell, he has never been able to obtain the larva in a stage intermediate between its earliest and its full-grown condition; and on this account he has delayed to publish a statement of what he already knew of the natural history of these singular insects.

The species on which Mr. Newport has made his investigations are *Meloë violaceus*, *Meloë proscurabæus* and *Meloë cicatricosus*, all

which he has procured at Richborough near Sandwich in Kent. The first two of these species come forth about the middle of March, and the latter from ten days to a fortnight later in the season. They feed chiefly on the buttercup (*Ranunculus acris*), and one species, *M. cicatricosus*, also on the dandelion.

When the Meloës first appear they are feeble, and have the body very small and contracted. In the course of a few days they become more active and are increased in size. They expose themselves much to the sun, and pair in the middle and warmest part of the day. On the 8th of April 1830, the author first observed a female preparing to deposit her eggs, and he has since had numerous opportunities of observing her thus occupied. She excavates a burrow, to the depth of about two inches, beneath the roots of grass in a dry soil exposed to the sun, usually at the side of a foot-path. Into this burrow she passes her body backwards, and having deposited a large packet of yellow-coloured cylindrical eggs, she closes up the burrow with earth and begins again to feed. Each female deposits eggs from three to four times during the season, at intervals of from one to two or three weeks. The greatest number are deposited at the first laying, and fewer at each succeeding laying. In order to ascertain the number deposited at the first laying by *Meloë proscarabæus*, Mr. Newport removed the ovaries from a specimen that had recently been impregnated, and having divided one ovary into pieces counted the number of eggs in each under the microscope, and found that one ovary contained 2109 eggs ready for deposition; so that the two ovaries contained the astonishing number of 4218 mature eggs, besides an almost equal number in the course of formation.

The structure of the egg, the membranes of the shell and embryo, the manner in which the embryo is liberated from the egg, the length of time it has remained in the egg state, and the circumstances which affect its development are then minutely detailed; as well as the changes produced in the instinct of the unimpregnated female.

The larva of *Meloë*, as it comes from the egg, is a yellow, slender, active little hexapod, scarcely one-twelfth of an inch in length. It attaches itself with great readiness to bees and flies, and clings so securely to them, that the insects are not able to remove it from their bodies, as was noticed in several experiments. These facts confirm the observations of Goedart and DeGeer, who first bred the larva from eggs deposited by *Meloë*.

The structure of the larva is next described, and compared with that of the *Pediculus apis* of Linnæus, as found on Hymenopterous insects, and the two are shown to be identical in every particular.

The *Meloë* larva is also compared with the *Pediculus Melittæ* of Mr. Kirby, with which also it agrees exactly in form and general structure, but differs in colour, that of the latter insect being always black, while the larva of *Meloë* is yellow. From this circumstance the author concludes that Mr. Kirby's insect is the larva of some species of another genus of the same family.

The habits of the larva of *Meloë* are then investigated, and the effects produced on it by exposure to light are minutely detailed. When light was totally excluded the larvæ remained perfectly quiet for several days, but the instant light was admitted they were in motion, travelling rapidly in a direction towards it. The experiments were made by enclosing larvæ in a phial, which was inverted and turned in opposite directions. When the phial was placed perpendicularly they invariably ascended to the top, and when placed in a horizontal direction they always ran to that end which was nearest the light, even when the stopper around which they had been lying was removed to allow of their escape. This influence of light Mr. Newport conceives may be that which induces them to ascend the yellow flowers of the dandelion and buttercup preparatory to their attaching themselves to bees that alight on the flowers to collect pollen, and which then carry them into their nests. This seems to be the object of their attacking the bees, to be carried to the nest where they are to reside as parasites, and subsist on the food stored up for the bee-larva, and not to prey on the bee itself.

The full-grown larva of *Meloë cicatricosus* is then described, and also the nymph and the imago. The author has found the insect in those stages in the nests of *Anthophora retusa*; but he has not hitherto succeeded in his attempts to rear the young larva of *M. violaceus* and *M. proscarabæus* in the nests of that insect. He concludes, therefore, that these species inhabit the nests of some other bees. In the stage between the very young and the full-grown period the larva is believed to be active and retain its six scaly feet, and to feed on the food prepared for the young bee. In its full-grown state the legs of the larva are reduced to six short tubercles. The insect is then very fat, inanimate, and of an orange-yellow colour, has ten pairs of spiracles, and greatly resembles the full-grown Hymenopterous larva. It remains but a short time in this condition before it changes to a nymph, and soon afterwards to an imago, in which form it passes the winter in a state of hibernation and comes forth in the spring.

In the course of this paper, while detailing the influence of light on the larva of *Meloë*, Mr. Newport stated that he had been led by

these and other facts, which showed the great influence of light on the instincts of the young animal, "to regard light as the primary source of all vital and instinctive power, the degrees and variations of which may, perhaps, be referred to modifications of this influence on the special organization of each animal body." This view has suggested itself to him in connexion with the discovery recently made by Mr. Faraday of the analogy of light with magnetism and electricity, and the close relation, previously shown by Matteucci to exist between electricity and nervous power, on which not only all the vital actions, but also the instinctive faculties seem to depend.

December 2.

E. Forster, Esq., V.P., in the Chair.

Edwin Charles Charlton, Esq., was elected a Fellow.

Read a paper "On the Anatomy of *Eriocauloneæ*." By the late William Griffith, Esq., F.L.S. &c. Communicated by R. H. Solly, Esq., F.R.S., L.S. &c.

The observations on which this memoir (written at Calcutta in 1835) was founded, were made at Mergui between the months of July and October 1834. The species examined were natives of that place, and six in number. They appear to be destitute of true spiral vessels, the place of which is supplied by ducts occasionally, but not freely, unrollable, aggregated in distinct fascicles and surrounded by more or less elongated cells.

Mr. Griffith describes the leaves of *Eriocaulon setaceum*, L., as the type of these organs in the genus, since they are in it reduced to the simplest state. They are submerged in this species, and the peduncles and their sheaths only rise above the surface of the water. The leaves are subulate, somewhat flattened and colourless below, green on their upper surface, and divided throughout their entire length into two distinct collateral tubes, by means of the central and only nerve which is attached both to the superior and inferior cutis by cellular tissue. Numerous transverse septa of cellular tissue divide each tube into chambers, which, however, have free communication with each other through fissures dependent on a partial

separation of the cells. The green parenchyma is almost entirely confined to the upper half of each tube, and ceases abruptly without any apparent cause. It consists of a single layer of colourless oval or roundish sacs, arranged with the most beautiful regularity in longitudinal lines extending from the base to the apex of the leaf, and corresponding with the bodies of the cells forming the cutis and not with the intervals between them. The stomata are confined to the under halves of the leaves, or to that portion of the tubes which is destitute of parenchymatous tissue.

In the terrestrial species the structure of the leaves is essentially the same, but the number of longitudinal tubes is increased, and varies from six to twenty, the central ones only reaching the apex of the leaf. The longitudinal divisions between these tubes are marked externally by corresponding depressions, and each is furnished with a vascular fascicle similar in structure and position to that of *E. setaceum*. The parenchymatous cells are arranged with less symmetry than in that species, and are not so completely confined to the upper surface; and the lower surface abounds with stomata.

The sheaths which envelope the base of the peduncle have in all the same organization, which is exactly that of the leaves of the terrestrial species. The peduncles are also composed of tubes, circularly arranged; they are marked externally with elevated whitish lines, which (in the living plant) have a slightly spiral direction from left to right, and correspond to the longitudinal septa. The tubes meet in a cellular axis, around which the vascular fascicles are arranged in corresponding number; and the septa form so many spokes consisting of more or less elongated cellular tissue, which in one species (*E. Wallichianum*) approaches in density to woody fibre. The parenchyma within the tubes is disposed with less regularity than in the leaves and sheaths, and their outer green parietes abound with stomata. With one exception, the number of tubes in the sheaths bears an exact relation to that in the peduncles of two to one.

The author describes the cavities existing in some *Alismaceæ*, *Pontederiæ*, *Cyperaceæ* and *Nelumbineæ*, as originating in the same manner as the chambers in the tubes of *Eriocaulon*, from the interposition of cellular septa perforated by fissures caused by the separation of the cells and not by any interruption of the membrane. In *Pontederia dilatata* raphides are found in great abundance in cells attached to the septa in such a manner as to project at right angles beyond either surface, and to occupy the spaces left by the separation of the ordinary cells. The same disposition occurs in some *Aroideæ*.

The existence of stomata in the submerged leaves of *E. setaceum* is mentioned as rather corroborating than weakening the general rule laid down by M. Adolphe Brongniart, that submerged leaves are destitute of cuticle. The stomata of *Eriocauloneæ* are described at length, and regarded as offering excellent examples of the correctness of M. Brongniart's statements with regard to the nature of these bodies. Their aperture communicates directly with the interior of the leaves, and is invariably occupied by air; the communication in *E. setaceum*, and in two other species in which the parenchyma is confined to the upper surface, being uninterrupted; while in the leaves of those species in which the parenchyma is deposited on the lower as well as the upper cuticle, there is invariably an open space left in it, corresponding with each stoma, and this opening appears always to be occupied by a bubble of air. The author states, however, that he is far from considering it proved, that such a free communication through the stomata, although the same structure is obvious in other plants belonging to different families, is universally present.

As *Xyrideæ* present none of the peculiarities of organization above mentioned, Mr. Griffith considers these peculiarities as corroborative of the correctness of Richard's opinion, since adopted by Professor Von Martius, that *Eriocaulon* is the type of a distinct family.

December 16.

E. Forster, Esq., V.P., in the Chair.

George Bowdler Buckton, Esq., was elected a Fellow.

Read a memoir "On the causes of disjunctions of Vegetable Substance, especially those which are horizontal." By the Rev. William Hincks, F.L.S. &c. &c.

After some preliminary observations on the subject of disruptions in general, the author briefly notices certain cases of vertical disruption, and then proceeds to the more immediate object of his paper, the horizontal separation of vegetable substance by natural means. This, he observes, may take place in the axis itself, or in any of the organs connected with it at their points of attachment, as in the fall

of the leaf, of sepals and petals, of entire flowers and fruits, and in the separation of such buds as form caulinary bulbs; or it may occur at some other part of the organ, a portion separating from the rest, or the whole breaking up into pieces. Every such separation, he argues, must depend on one of the three following causes: 1. on a stoppage of the circulation from ligature; 2. on unequal rapidity of growth of the two parts; or 3. on the confinement within coherent envelopes (which do not admit of extension) of a portion of the axis or of some growing part, so that the force of growth bursts the envelope, carrying off its upper portion. These general rules he then proceeds to apply to the explanation of particular cases.

Of stems usually termed Articulate, some, such as those of *Kleinia articulata*, have no tendency to disruption at the supposed joint, which is merely the commencement of a new branch. In the misletoe, on the other hand, the author believes that the tendency to divide at the bases of the branchlets may be consequent on the dichotomous structure, which causes a pressure equivalent to a ligature at the point of division.

With respect to the fall of the leaf, he refers to the observations of DeCandolle and Du Petit Thouars, which he does not think sufficient to account for that phænomenon in a multitude of cases, but regrets that he can throw no additional light on the subject. He attributes the separation of the sepals and petals when they are caducous, to the outward pressure occasioned by the more rapid development of the interior circles stopping the circulation of the fluids, and conceives this to be strikingly exemplified in *Papaveraceæ*, where the growth of the petals within the bud is great and rapid. He notices a specimen of *Eschscholtzia* in which the sepals cohering less firmly than usual, the calyx, instead of being thrown off in the form of a calyptra, remains after the opening of the flower partially adhering; and observes that the ordinary disruption in this genus takes effect, not at the base of the sepals, but at a point above this, where the pressure occasioned by the enlargement of the petals is greatest. He instances also the genus *Eucalyptus*, in which there is a strong coherence of the sepals, and the lower portion of the calyx being strengthened by the adherent torus, the growth of the interior organs supplies the force which separates the part of the coherent sepals above the torus in a solid piece like the cover of a vessel. On the cause of the horizontal separation of a portion of the anthers in the form of valves, which occurs in a few instances, he is not prepared to offer any opinion.

In the fruit, as in the calyx, the author believes that horizontal

disruption arises from the force of cohesion of the parts of the circle, the absence of any of the causes favourable to dehiscence along the midrib of the carpellary leaf, and the operation of some force pressing either from without or from within on one particular line encircling the fruit; and he proceeds to offer explanations of those cases with which he is most familiar. He takes first the circumscissile capsule of *Anagallis*, in which he states that the central free receptacle with the seeds upon it continuing to enlarge in both diameters after the envelope has ceased to grow, and having occupied from the first the entire cavity, it is naturally to be expected, since the chief extension of the interior parts is upwards (the natural direction of growth), while the enlargement of the seeds in the lower half tends to press back the parts of the lower hemisphere, that uniform and regular pressure will resolve a nearly spherical capsule into two equal hemispheres. This remark he applies to *Centunculus* also, but confesses himself at a loss to give any reason why the opening of *Trientalis*, which depends on the same general causes, should be irregular. For the separation of the lid of the capsule in *Hyoscyamus* he accounts by the contraction and rigidity of the throat of the calyx exercising a gradually increasing pressure around the upper part of the capsule, and thus causing its separation by the first of the general principles laid down.

The author then proceeds to the case of *Lecythis*, which he thinks is to be explained by the third of his general principles. In illustration of this principle he refers to a monstrosity of the common Tulip, described and exhibited by himself some years ago at a meeting of the British Association. In this monstrosity, the upper leaf, being unusually developed, has cohered by its edges so firmly as to imprison the flower, and this constraint occurring at a period when the stalk was increasing in length, and previous to any considerable enlargement of the flower-bud, the force applied was chiefly vertical, and has carried off the upper part of the leaf in the form of a calyptra, leaving the lower part in the shape of a cup, from the centre of which the stem appears to rise. The separation of the lid of the capsule of *Lecythis* he believes to be effected in an analogous manner; the septa which form the two or four cells into which the fruit is divided meet in a thickened axis, and the outer part of the fruit becoming (partly from its natural texture and partly from the adherence of the torus and calyx) hard, solid and fully grown, while the axis continues slowly to extend, and thus to press upwards that portion of the capsule which rests upon it, causes that portion first

to become slightly prominent, and finally by a strain upon the vessels of that particular part to fall off in the shape of a lid. In *Couroupita* the pressure is sufficient to mark the surface of the fruit with a prominence, but from the partitions giving way early, and from the abundant juices produced in the interior, there has not been, he conceives, sufficient pressure to occasion disruption. In all the species of *Lecythis*, he observes, the extent of the loose cover corresponds with the extent of the axis, and what remains of the latter continues attached to it.

As regards lomentaceous fruits in general, the author believes that the intervals between the seeds being sufficient to admit of the sides of the fruit cohering (which is promoted in particular instances by special causes), the swelling of the seeds afterwards stretches the parts over them in a degree which this coherence prevents from being equally distributed, drags the tissue forcibly from the junctures which are fixed points, and thus there being a strain in each direction from the middle line of the juncture, the contraction of drying during the ripening of the fruit effects the separation.

Finally the author refers to the horizontal separations in the capsules of *Mosses*, and observes that the separation of the calyptra affords a plain example of the operation of his third principle; but with regard to the nature of the operculum, although he has an hypothesis under consideration, his mind is not yet satisfied. He states his object in the present paper to have been the investigation of the immediate physical causes of certain known effects, but he has not thought this the place even to touch upon their ultimate causes or the ends to accomplish which they are apparently designed, and which adapt them to the position and general structure of the particular plant.

Read also the conclusion of Dr. J. D. Hooker's "Enumeration of the Plants of the Galapagos Islands, with descriptions of the new species."

In a brief introduction Dr. Hooker offers his acknowledgements to Mr. Darwin, by whom the collection on which this enumeration is chiefly founded was made, and to Prof. Henslow, in whose charge the collection had been placed, and who kindly relinquished his intention of publishing the novelties contained in it in favour of the author. He also notices the striking peculiarities which mark the flora of the Galapagos group, the plants composing which not only differ in a great degree from those of any other country, but are in many

cases peculiar to the separate islands, although in those instances frequently representatives of others which are found on different islands.

The number of species enumerated is two hundred and twenty-eight. Of these upwards of a hundred are described as new, and six new genera are established, the characters of which are given as follows:—

Ord. BORAGINEÆ.

Gen. GALAPAGOA, Hook. fil.

Calyx 4-5-partitus; laciniis linearibus. *Corolla* infundibuliformis; tubo lato; limbo 5-fido patente; fauce nudâ. *Stamina* 5, inclusa, imo corollæ tubo inserta. *Ovarium* 4-loculare. *Stylus* terminalis, ad basin usque bipartitus; stigmata 2, obtusa. *Semina* pendula; albumine parco, carnoso; cotyledonibus planis; radiculâ majusculâ, superâ.—*Herbæ Insularum Galapagos, hispido-pilosæ. Caules prostrati, ramosissimi. Folia alterna, coriacea, versus apices ramulorum densissimè conferta. Flores parvi, in axillis foliorum omninò sessiles, valdè inconspicui.*

Obs. Genus *Ehretiarum* inter *Coldeniam* et *Rhabdiam* (secund. Clariss. Benthani) medium, ob stylum bipartitum staminaque fundo corollæ inserta singulare.

Ord. SOLANEÆ.

Gen. DICTYOCALYX, Hook. fil.

Calyx cylindraceus, 5-fidus; lobis acutis; tubo post anthesin subinflato, membranaceo, reticulatim venoso. *Corolla* membranacea, subinfundibuliformis; tubo gracili gradatim supernè ampliato; limbo plicato, brevi, vix explanato. *Staminum filamenta* elongata; antheræ inclusæ. *Ovarium* disco carnoso insertum; stigmatè capitato. *Capsula* evalvis, indehiscens, bisulcata, incompletè 4-locularis, calyce ventricosò inclusa. *Semina* plurima, majuscula, tuberculata, dissepimenti medio prope angulum parietalem affixa; testâ nitidâ, obscurè granulatâ. *Endryo* arcuatus.—*Herbæ Americanæ, repentes, glanduloso?-pubescentes, cum tribu Daturearum, suadente Clariss. Miers, conferendæ. Folia membranacea, angulata v. sinuata, subopposita v. bina. Flores axillares.*

Ord. COMPOSITÆ.

Gen. DESMOCEPHALUM, Hook. fil.

Capitula in axillis foliorum densissimè congesta, monoica, 6-flora; floribus 3 fœmineis ligulatis, cæteris masculis tubulosis. *Involucrum* compressum; foliolis 3-5 inæqualibus. *Receptaculum* minimum, epaleaceum. *Corolla fœminea* tubo brevi, lato, piloso; ligulâ latâ, involutâ, bifidâ: *mascula* 4-fida, dentibus extûs hispido-barbatis. *Antheræ* ecaudatæ. *Stylus* floris masculi indivisus, acutus; floris fœminei in ramos 2 elongatos desinens. *Achenium* latè obcuneatum, compressum, subtrigonum, supernè pilosum, foliis involucralibus immutatis tectum.—*Genus Elviræ affine. Radix annua. Caulis pedalis, herbaceus, teres, erectus, a basi*

trichotomè divisus; ramis ascendentibus pubescentibus. Folia opposita, petiolata, ovata, obtusa, duplicato-serrata, coriacea, suprâ scabriuscula, nitida, subtùs pubescentia, nigricantia. Capitula axillaria, densissimè congesta, massam depresso-sphæricam semunciam latam efformantia. Involucri foliola latè ovata, acuminata, hispida. Corolla valdè inconspicua.

Gen. MICROCECIA, Hook. fl.

Capitula axillaria, pauca, valdè compressa, monoica, subtriflora; floribus fœmineis ligulatis, masculis tubulosis. Involucrum compressum, 3-4-foliolatum; foliolo unico latè obovato, unilaterali, cæteris parvis collateralibus. Receptaculum minimum, epaleaceum. Corolla floris fœminei tubo gracili; laminâ rotundatâ, obscurè crenatâ: floris masculi 4-fida; tubo supernè ampliato; segmentis extùs barbatis. Antheræ semi-exsertæ, ecaudatæ. Stylus floris fœminei in ramos 2 elongatos desinens; floris masculi indivisus. Achenium cuneatum, compressum, obscurè trigonum, parcè pilosum.—Herba pusilla, repens, scaberula; ramis gracilibus, ascendentibus. Folia opposita, petiolata, rigidula, ovata, acuta, serrata, suprâ hispidula, subtùs cuna, venis prominulis. Capitula minima, breviter pedicellata. Involucri foliolum exterius planum, acuminatum, nervosum, marginibus basi involutis. Flores exserti, flavi.

Gen. MACRÆA, Hook. fl.

Capitulum multiflorum, heterogamum, radiatum; floribus radii squamis involucri tectis, paucis, 1-serialis, fœmineis; disci tubulosis. Involucri hemisphærici squamis sub-2-serialis, disco brevioribus. Receptaculum convexum, paleaceum; paleis deciduis flores involucrantibus. Corolla radii tubo brevi gracili, ligulâ latâ bifidâ; disci tubo 4-fido, dentium marginibus incrassatis. Antheræ breviter appendiculatæ. Stylus floris radii in ramos duos obtusos desinens; disci ramis cono latiusculo terminatis. Achænium obovato-cuneatum, compressum, trigonum, hispidum, pappo brevi e squamis paucis ciliatis coronatum.—Genus Heliopsidis relatum. Frutex; ramis erectis virgatis, nodosis. Folia in ramis abbreviatis fasciculata, rigida, linearia, integerrima, pilosa, suprâ nitida, marginibus revolutis. Pedunculi folia superantes, graciles, sericei. Capitula sphærica. Flores flavi, radii pauci. Receptaculi paleæ lineares, apicibus incurvis acuminatis, dorso hispidis.

Ord. Incert.

Gen. PLEUROPETALUM, Hook. fl.

Calyx persistens, bipartitus; sepalis latè ovatis. Petala 5, subæqualia, libera, concava, coriacea, siccitate multicostata. Stamina 8, toro inserta; filamentis in tubum membranaceum coalitis; antheris elongatis, ovarium vix superantibus. Styli 4, lineares. Ovarium 1-loculare, pluriovulatum; ovulis placentæ basilari funiculis elongatis adnexis.—Suffrutex? perennis, glaberrima, siccitate nigricans; ramis teretibus, strictis, apicem versus foliosis. Folia petiolata, patentia, elliptica, utrinque attenuata, longè acuminata, integerrima. Flores in paniculus breves,

paucifloras, terminales dispositi, breviter pedicellati, inconspicui. Calyx parvus, carnosus. Petala majuscula.

Obs. Genus nulli ordini arcè affine, habitu *Phytolacæ*.

January 20, 1846.

R. Brown, Esq., V.P., in the Chair.

Robert James Nicholl Streeton, Esq., M.D., and Robert Marnock, Esq., were elected Fellows.

Read a memoir "On the Structure of the Ascidia and Stomata of *Dischidia Rafflesiana*, Wall." By the late William Griffith, Esq., F.L.S. &c. Communicated by R. H. Solly, Esq., F.R.S., F.L.S. &c.

This paper bears date at Mergui, November 7th, 1834. In it the author gives a detailed description of the arrangement, form and structure of the ascidia of the species of *Dischidia* above-named, and comes to the conclusion that they are modified *laminæ* of leaves, in proof of which he adduces: 1st, their similarity in texture, internal structure, and structure of stomata with the limbs of the ordinary leaves; 2ndly, the slight but constant tendency in the limb of the leaves to assume an involute form; 3rdly, the occurrence of an imperfectly transformed pitcher, in which the body of the pitcher is clearly referable to the limb of the leaf; and 4thly, the general construction of the petioles in *Asclepiadeæ*, which renders it more natural to refer the ascidia to the limb of the leaf in that family. He regards the inner surface of the pitcher as corresponding with the upper surface of the leaves; and is confirmed in this view by the greater abundance and development of the stomata on those surfaces. On the lower and outer surfaces the stomata are more or less imperfect; but on the upper and inner they show a considerable degree of complexity. They are particularly remarkable for the existence of an external cellular *bourrelet* or thickening, much elevated above the surface and of a whitish colour, giving rise to an appearance of minute white dots, which are especially conspicuous on the purple inner surface of the ascidia. They appear to have a very slight connexion with the cuticle, from which they are easily detached, and are not met with on old ascidia. Each *bourrelet* is composed of from

three to five cells, assuming the appearance of a cup-shaped gland. The stomata themselves are also somewhat elevated above the cutis; the surrounding cells are parallelogrammic and disposed in circles, into the composition of each of which enter three or four cells, and each circle diminishes successively in size from without inwards. The stoma occupies the space of the innermost circle, and in itself presents nothing unusual.

Read also a paper by the same author, dated Calcutta Botanic Garden, July 1st, 1835, "On the Seeds of *Careya*, Roxb."

The author gives a detailed description of the seeds of *Careya herbacea* (those of *C. arborea* he states to be exactly similar), from which it results that the fleshy body which constitutes the entire mass of the seed, after the removal of the testa, consists of a peripheral fleshy mass and a central subulate body firmly adherent with it, of similar texture, and having its apex directed towards one side of the hilum. At the opposite extremity the outer mass is surmounted by a number of colourless scales, surrounding and concealing other more minute scales which occupy the distal extremity of the central subulate body. There are no traces of cotyledonary division, and the subulate body, excepting at its divided upper extremity, is continuous with the rest of the fleshy mass. The commencement of the germination takes place while the seeds are still enclosed in the fruit. The integument is ruptured longitudinally, and generally with some degree of regularity along the apex; from this opening are exerted pale greenish scaly leaf-like bodies, consisting first of those which surmount the outer mass, and subsequently of the divided termination of the central subulate body. As this latter increases in length, it is seen to terminate in a green convolute leaf, in the axilla of which is placed another very rudimentary one. At this period the extremity of the subulate body next the hilum has also become exerted, and forms a subulate fleshy and undivided projection. Into this the cellular tissue of the fleshy body passes, although there is a faint line of demarcation between the two.

The absolute nature of the outer fleshy part, Mr. Griffith observes, can only be determined by pursuing the development of the ovula. The nature of the subulate body is evident: it is the root, the true plumula being the minute scaly body at its distal end. The root points, as it should do, towards one side of the hilum, the situation in fact of the foramen. At the collet it is continuous with the plumula, and laterally with the outer fleshy mass, which ought therefore to be cotyledonary, and taking it to be so, might be explained

by supposing the cotyledons to be affixed in a peltate manner, and united into a solid mass.

Mr. Griffith was precluded from the further pursuit of the subject, with reference to the development of the ovula and the more advanced germination, by the departure of the Deputation for the investigation of the Tea-districts of Upper Assam, of which he formed part.

February 3.

The Lord Bishop of Norwich, President, in the Chair.

James Ogden, Esq., M.D., and Charles Du Cane, Esq., Capt. R.N., were elected Fellows.

Read papers on various subjects, bearing date in 1834 and 1835, by the late William Griffith, Esq., F.L.S. &c., communicated by R. H. Solly, Esq., F.R.S., F.L.S. &c.

The first of these contains the description of a plant found by Mr. Griffith in a small island near Mergui, called Madamacan, and which he has characterized under the generic name of *Corysadenia*, but which is evidently the same with Dr. Blume's genus *Illigera*, published in Europe in 1834, and consequently then unknown to the author. In common with that botanist, and acting on a suggestion of Dr. Wight, he indicates its near affinity to *Gyrocarpus*, with which he suspects that it should form an order, to be called "*Gyrocarpeæ*." He notices these genera as forming exceptions to a general rule pointed out by Mr. Brown, that the ovarium of dicotyledonous plants, when single, never adheres to the calyx.

In the next paper, Mr. Griffith makes some additions to our knowledge of the genus *Henslowia*, which he characterizes as follows:—

HENSLOWIA, Wall.

Dioica. *Mas*: calyx suburceolatus, 5-partitus; laciniis æstivatione apertis.

Corolla nulla. *Stamina* 5, calycis sinubus inserta; filamentis per æstivationem introflexis, demùm erectis longèque exsertis; antheris terminalibus, 2-locularibus, loculis angustis distantibus longitudinaliter dehiscentibus. *Ovarii* rudimentum centrale, biloculare. *Fœm.*: calyx

ferè ut in mare. *Stamina* abortiva 5. *Ovarium* liberum, biloculare, polyspermum. *Stylus* filiformis. *Stigma* oblongum, peltato-capitatum. *Ovula* indefinitè numerosa, placentæ axili affixa. *Capsula* supera, bilocularis, bivalvis; valvis medio septiferis, mediante stigmate persistenti connexis. *Semina* plurima, minuta, reticulata, apiculata, placentæ transversim affixa, dorso secus racheos directionem cristata; *albumen* nullum; *cotyledones* parvæ; *radicula* ratione cotyledonum longa, clavata, hilum spectans; *plumula* inconspicua.—Arbores; ramis *oppositis determinatè ramosis*; foliis *oppositis, exstipulatis, integris*; racemis *paniculatis*; floribus *minutis, inconspicuis*.

A part of the additional information on this curious genus has already appeared (on Mr. Griffith's authority) in Prof. Lindley's 'Natural System of Botany.' After noticing the Combretaceous habit of the male tree when in full flower, Mr. Griffith adds, that it can scarcely be doubted that it is the type of a distinct order, and hazards an opinion that its true situation in the natural system will be found between *Lythraceæ* and *Melastomaceæ*. He observes also that the ovula present the peculiarity of the raphe running along their upper or under faces, independent apparently of any twisting of the short funicle.

Mr. Griffith next characterizes a new genus of the order *Ternstræmiaceæ*, as follows :—

Gen. ERYTHROCHITON, Griff.*

Flores dioici, bibractcolati. *Calyx* inferus, profundè 5-partitus. *Petala* 5, hypogyna, libera, sepalis opposita. *Stamina* indefinita, hypogyna, multiplici serie. *Antheræ* aduatæ, truncatæ. *Ovarium* 2-loculare, 4-ovulatum. *Styli* 2. *Stigmata* 2, reniformia, foliacea. *Bacca* supera, 2-locularis, 2-4-sperma. *Semina* pendula, albuminosa. *Embryo* curvatus.—Arbor *mediocris*; foliis *stipulatis, pereunantibus, integris*; pedunculis *extra-axillaribus*; floribus *solitariis*; facie *quodammodò Camelliæ*.

ERYTHROCHITON WALLICHIANUM.

Hab. in sylvis secus littora Insulæ Madamacan, Mergui proximæ; lect. mense Decembris 1834.

Mr. Griffith adds in a note, that to this genus *Hopea eglandulosa*, Roxb., which Mr. Colebrooke in a MS. note in Roxburgh's MS. Synopsis stated long ago not to belong to *Hopea* (*Sarcostigma Roxburghii*, Wall. MSS., formerly called by Mr. Brown *Wahlenbergia*), appears to have a considerable similarity in habit and in the structure of the stigmata and ovarium. And a similar correspondence exists, as far as can be judged from a drawing in the Botanic Garden at

* Nec Nees et Mart. —SECR.

Calcutta, with another unpublished plant from Sylhet, probably forming a second species of Dr. Wallich's *Sarcostigma* *.

Lastly Mr. Griffith characterizes a new genus of *Anacardiaceæ*, under the name of

GEN. SWINTONIA, Griff.

Sepala 5, basibus coalita, persistentia. *Petala* 5, hypogyna, sub fructu demum ampliata. *Stamina* totidem, toro cylindrico parum elevato insidentia. *Ovarium* subæquilaterale, in apice tori staminiferi sessile. *Stylus* filiformis; *stigma* peltato-capitatum. *Fructus* siccus, exstipitatus, petalis ampliatis foliaceis suffultus.—Arbor magna, resinosa, facie quodammodo Mangiferæ. Folia lanceolata, coriacea. Paniculæ axillares terminalesque; flores inconspicui.

SWINTONIA FLORIBUNDA.

Hab. in colle alto Insulæ Madamacan Mergui proximæ, Pator dicto, copiosè; florens Novembri et Decembri, fructifera Februario.

This genus is dedicated to George Swinton, Esq., late Secretary to the Bengal Government, who has always been ready to promote the interests of science and the welfare of the Tenasserim Provinces, and to whom Dr. Wallich had intended to dedicate his genus *Melanorrhæa*. In the structure of its fruit it is very nearly allied to *Melanorrhæa*; and in that of the flowers, particularly as regards the mode of adhesion of the petals and stamina to the torus, it approaches to *Syndesmis* of the same author.

February 17.

E. Forster, Esq., V.P., in the Chair.

Major Proby T. Cautley and Edward Kelaart, Esq., M.D., were elected Fellows.

Mr. Ward exhibited specimens of the extreme states of *Chondrus crispus*, Lyngb., gathered by him at Linmouth, N. Devon, growing within a few feet of each other, but under different conditions; the broad variety being found in pools among the rocks, where it is always submersed; the narrow on the outer ledge of rocks, where it

* Not *Sarcostigma* of Drs. Wight and Arnott in Edinburgh New Phil. Journ. vol. xiv. p. 299.—SECR.

is fully exposed to the action of the waves, which produce the same effect upon it as is frequently observed in freshwater aquatics, the submersed leaves of which become more or less finely divided, in proportion to the greater or less rapidity of the stream. It is worthy of remark, that the broad state, which is found in comparatively still water, is wholly free from zoophytes, while the narrow is entirely coated with them.

Read some observations "On the Axial and Ab-axial arrangement of Carpels." By T. S. Ralph, Esq., A.L.S. &c.

Mr. Ralph begins by referring to the differing position of the odd sepal pointed out by Mr. Brown as constituting a character of ordinal value between *Leguminosæ* and *Rosaceæ*, and to the uniform position of the solitary carpellum in the former, and endeavours to determine, either hypothetically or from actual observation, the relation of carpella to axis in various families and genera of plants. He notices a specimen of *Heracleum giganteum*, in which three mericarps were developed, and states that in each case the additional mericarp was placed side by side with the ab-axial (or anterior) mericarp, from which circumstance he concludes the axial (or posterior) to be in this case the odd carpellum. In a specimen of an *Oenothera* with five instead of four carpella, he found the fifth carpellum apparently ab-axial. He conjectures from the position of the abortive stamen in *Scrophularinææ*, that the odd carpellum is in that family ab-axial; and in other cases, such as *Lychnis* for example, he endeavours to determine its position by means of the odd style. He refers the arrangement of carpella in relation to axis to four heads; viz. definite, 1. axial or centripetal, 2. ab-axial or centrifugal; indefinite, 3. anterior and posterior, 4. right and left. In the two latter cases the position must be determined theoretically. He concludes by giving a list of genera examined by himself, and arranged under the heads of carpels "axial," and "ab-axial."

Read also a continuation of Dr. Boott's "Caricis Species Novæ v. minùs cognitæ." In this, the third part of his paper, Dr. Boott describes seventeen species, the characters of which are as follows:—

1. C. RARA, spicâ simplici oblongâ fuscâ androgynâ apice masculâ, stigmatibus 3, perigyniis ovatis acuminatis rostratis ore emarginatis crebrè et validè nervosis divergentibus squamâ ovatâ obtusâ v. acutiusculâ ferrugineâ longioribus.

Hab. in Mont. Khasiya Indiæ Orientalis, *Griffith in Herb. Lemann.*

Obs. C. *polytrichoides*, Muhl. affinis.

2. *C. ESENBECKII*, spicâ cylindricâ dioicâ? v. androgynâ apice masculâ multiflorâ basi laxiflorâ fœmineis paucioribus alternis instructâ, stigmatibus 2, perigyniis (floriferis) linearibus ore membranaceo truncato obliquè fisso ciliato-serratis squamâ lanceolatâ hispido-mucronatâ angustioribus longioribusque.

C. trinervis, Nees in *Wight, Contr. Ind. Bot.* (non Decand.)

Hab. in Indiâ Orientali, Moura, *Royle*. In Monte Chûr, ad alt. ped. 12,000, *Edgeworth*.

3. *C. GEYERI*, spicâ simplici androgynâ apice masculâ basi flosculis fœmineis 1 v. 2 alternis instructâ, stigmatibus 3, perigyniis triquetro-ovatis stipitatis rostratis ore integro glabris pallidis squamâ latâ basi amplectente brevi-cuspidatâ dorso trinervi pallidâ ad latera ferrugineâ brevioribus angustioribusque.

Hab. in declivitatibus aridis Montium Saxosorum, Americæ Septentrionalis, *C. A. Geyer*, no. 332 (*Herb. Hook.*).

Obs. Affinis *C. phyllostachys*, Meyer, quæ flosculis fœmineis sæpè 3, squamis masculis brevioribus apice hyalinis, fœmineis foliaceis longissimis, rachi flexuosâ, differt.

4. *C. COACTA*, spicâ castaneâ basi setaceo-bracteata e spiculis pluribus androgynis apice masculis parvis ovatis sessilibus ebracteatis in capitulum longiusculum arcuè congestis compositâ, stigmatibus 2, perigyniis ovatis acuminato-brevi-rostratis bifidis stipitatis utrinque sub-9-nerviis supernè ad margines bialatas serrato-scabris stramineis squamâ ovatâ hispido-mucronatâ brevioribus.

Hab. in Affghanistan, *Griff.*, no. 79 (*Herb. Hooker*).

Obs. Affinis *C. vulpinæ*, L.; differt culmo obtusangulo, supernè gracili, nec in axim angustiore abruptè coarctato. A *C. vulpinari*, Nees, spicâ longâ cylindricâ basi minùs compositâ (nec ovatâ), perigyniis scabris, distincta. A *C. glomeratâ*, Thunb. culmo graciliori obtusangulo, perigyniis sub-9-nerviis, spicâ congestâ (nec basi sublobatâ), bractea solùm ad basin spicæ setaceâ, foliis angustioribus (nec glaucescentibus) differt.

5. *C. SANGUINEA*, spicâ decompositâ duplicato-racemosâ; racemis terminalibus axillaribusque remotis solitariis geminatisque longè exsertè pedunculatis vaginatis; spiculis 3—8 ovatis sessilibus atro-purpureis androgynis apice masculis ad apicem pedunculorum spicatum v. duplicato-spicatum dispositis, stigmatibus 3, perigyniis trigono-ovatis rostratis bifidis nervosis stipitatis scabris subrecurvis squamâ latâ ovatâ acutâ v. mucronulatâ purpureâ longioribus.

β. magis composita (junior).

Hab. in Affghanistan, *Griffith*, no. 96. *β.*, No. 91 (*Herb. Hook.*).

Obs. Ad gregem *C. polystachyæ*, Willd. &c. pertinet.

6. *C. RAFFLESIANA*, spicâ ferrugineâ concolori subsesquipedali paniculatâ e spiculis permultis congestis sessilibus oblongis androgynis apice masculis supra-decompositâ; paniculis terminalibus axillaribusque multi-

floris : superioribus sessilibus approximatis simplicibus solitariis : inferioribus remotis longè pedunculatis decompositis geminatis vaginato-bracteatis, stigmatibus 3, perigyniis trigono-ellipticis acuminatis longè rostratis obliquè recurvis bidentatis nervosis supernè plùs minùs scabriusculis ad margines serrato-scaberrimis lineolis purpureis notatis squamâ ovatâ uninervi ferrugineâ mucronatâ longioribus.

Hab. in Ins. Java, *Horsfield*.

Obs. Affinis *C. raphidocarpæ*, Nees, quæ perigynio glabro subciliato, squamâ subulato-acuminatâ, foliis subtùs margineque hirtis, differt. A *C. ramosâ*, Schk., *C. flicinâ*, Nees, *C. meiyoginâ*, Nees, inflorescentiâ densiore aliisque notis differt.

7. *C. PRESCOTTIANA*, spicis 6 elongatis cylindricis approximatis stramineis concoloribus : terminali 1 v. 2 masculâ : reliquis fœmineis sessilibus nutantibus evaginatibus inferioribus longè foliaceo-bracteatis basi laxifloris, stigmatibus 2, perigyniis lato-ellipticis brevi-rostratis bidentatis compressis nervosis divergentibus stramineis squamâ hispidomucronatâ dorso trinervi pallidâ ad latera ferrugineâ latioribus longioribusque.

Hab. in Napaliâ? *Herb. Wallich.*, no. 3386.

Obs. Affinis *C. crinitæ*, Lam.

8. *C. JUNCEA*, spicis 2—4 gracilibus erectis ferrugineo-purpureis : terminali masculâ filiformi : reliquis fœmineis laxifloris subremotis infimâ pedunculatâ evaginatâ, stigmatibus 3, perigyniis triquetro-fusiformibus ore integro apice scabris squamâ ovatâ obtusâ longioribus vel lanceolatam mucronatam subæquantibus.

C. juncea, *Willd. Enum. Suppl.* p. 63 ; *Kunth, Cyper.* p. 468.

C. miser, *Buckley in Sillim. Journ.* 45. p. 173.

C. Rugeliana, *Kunze in Herb. Hooker* (ex parte).

Hab. in Montibus Carolinæ Septentrionalis, *Buckley, Rugel*.

Obs. Affinis *C. brachystachys*, Schk. quæ perigyniis foliis infimis vaginisque glabris, &c. differt.

9. *C. OLIVACEA*, spicis 6—8 elongatis cylindricis alternis remotis : masculis ferrugineis 2 : fœmineis 4 v. 5 rariùs 6 apice masculis fusco-olivaceis longissimè bracteatis infimâ remotâ rariùs inclusè pedunculatâ, stigmatibus 3, perigyniis ellipticis acuminato-rostratis bidentatis ventricosis nervosis rugosis divaricatis squamâ lanceolatâ hispido-aristatâ brevioribus latioribusque.

Hab. in Assam Indiæ Orientalis, *Major Jenkins (Herb. Hooker)*.

Obs. Habitus *C. pendulæ*, Huds.

10. *C. GRIFFITHII*, spicis 4 v. 5 purpureis : terminali masculâ obovatâ : reliquis fœmineis oblongo-cylindraceis inferioribus exsertè pedunculatis basi attenuatis erectis, stigmatibus 3, perigyniis ovalibus tenuissimis abruptè brevi-cylindrico-rostratis ore integro v. emarginato membranaceo enerviis margine supernè scabriusculis purpureis basi albidis com-

pressis squamâ lanceolatâ acuminatâ longè cuspidatâ purpureâ nervo albo angustioribus brevioribusque.

Hab. in Affghanistan, *Griffith*, no. 78 (*Herb. Hooker*).

Obs. Affinis *C. lucida*, Boott.

11. *C. SULLIVANTII*, spicis 4—6 cylindricis gracilibus: masculâ 1: fœmineis 4 rariùs 3—5 laxifloris erectis pedunculatis superioribus approximatis infimâ remotâ exsertè pedunculatâ basi attenuatâ sæpè compositâ, stigmatibus 3, perigyniis ellipticis brevi-rostratis ore integro v. emarginato viridibus pellucidè punctatis pilosis enerviis squamâ ovatâ ciliatâ hispido-mucronatâ albidâ nervo viridi paululùm longioribus.

C. Sullivantii, B. Bot. Exc. to the Mount. of N. Carol. Gray in Sillim. Journ. 42. p. 29.

Hab. in sylvaticis prope Columbiam Ohionis, Americæ Septentrionalis, *W. S. Sullivant* (1840).

Obs. Affinis *C. arctatæ*, Boott, satis herbâ pilosâ, spicis erectis, perigyniis enerviis distincta.

12. *C. ACUTATA*, spicis 5 v. 6 erectis cylindraccis fuscis: masculâ 1 v. 2 sessilibus: reliquis 4 fœmineis sæpè apice subulato-acutatis masculis densifloris sessilibus vel pedunculatis longè foliaceo-bracteatis alternatim contiguis, stigmatibus 3, perigyniis elliptico-lanceolatis rostratis bifurcatis subinflatis nervosis glabris nitidis squamâ purpureo-ferrugineâ concolori v. apice hyalinâ ciliatâ hispido-aristatâ longioribus.

C. physocarpa, *Nees* (*non Presl*).

Hab. in Americâ Meridionali; in Ins. Chiloe, *Cuming*, no. 43; in Monte Pilylum Columbiae, ad alt. ped. 12,000, *Jameson* (*Herb. Hooker*).

Obs. Affinis *C. paludosæ*, Gooden.

13. *C. THECATA*, spicis 4—6 erectis pallidis v. castaneis: terminali masculâ cylindraccâ: reliquis fœmineis oblongis remotis inferioribus exsertè pedunculatis longè bracteatis vaginatis, stigmatibus 3, perigyniis (floriferis) ovatis bidentatis utrinque nervosis ad margines denticulatis squamâ ovatâ acuminatâ v. cuspidatâ dorso nervosâ brevioribus.

Hab. in arenosis Insulæ Rottneſt prope Prest, *Preiss*, 1839 (*Herb. Ward.*); ad fl. Cygnorum, *Drummond*, no. 921 (*Herb. Hooker*).

Obs. Affinis *C. alveatæ*, Boott; differt perigyniis bidentatis margine denticulatis.

14. *C. TUCKERMANI*, spicis 5 v. 4 rariùs 6: masculis 2 rariùs 3 v. 1: fœmineis 3 v. 2 oblongis cylindraccisque crassis subapproximatis pedunculatis longissimè bracteatis infimâ sæpè demùm nutante, stigmatibus 3, perigyniis tenuibus pellucidis oblongo-ovatis acuminatis longè cylindrico-rostratis bifurcatis glabris turgidè inflatis pallidis obliquè adscendentibus 10—14-nerviis squamâ ovatâ acutâ v. hispido-mucronatâ multùm latioribus longioribusque.

C. bullata, *Tuckerman*, *Enum. Method. Car.* p. 20 (*non Schkuhr*).

Hab. in Americâ Septentrionali, "nondum in Novâ Angliâ visa," *Tuckerman*.

Obs. Affinis *C. bullatæ*, Schk. Differt perigyniis tenuioribus pellucidis majoribus obliquè adscendentibus, rostro glabro, squamis sæpè mucronatis, spicis fœmineis pluribus longioribus longiùs pedunculatis nutantibus, foliis latioribus, culmo scabriore, pedunculis scabris.

15. *C. SPICULATA*, spicis 4 v. 5 cylindraceis pallidis erectis androgynis apice masculis superioribus approximatis sessilibus infimâ subremotâ exsertè pedunculatâ, stigmatibus 3, perigyniis triquetro-ellipticis cylindrico-rostratis bifidis stipitatis supernè ad margines scabris nervosis squamâ lanceolatâ acuminatâ v. hispido-cuspidatâ longioribus.

Hab. in Montibus Khasiya Indiæ Orientalis, *Griffith (Herb. Lemann)*.

Obs. Affinis *C. setigera*, Don (*C. hymenolepis*, Nees), quæ perigyniis scabris, squamis testaceis, spicis supremis masculis differt.

16. *C. MOORCROFTII*, spicis 3 v. 4 ovalibus congestis : terminali masculâ : reliquis fœmineis v. apice masculis infimâ pedunculatâ lanceolato-bracteata, stigmatibus 3, perigyniis ovali-globosis rostratis bifidis enerviis nitidis glabris v. supernè ad margines hispidulis pellucidè punctulatis stramineis rostro purpurascente longè stipitatis squamâ lanceolatâ acutâ fusco-purpureâ apice marginibusque albo-membranceâ brevioribus.

Hab. in Indiâ Orientali, ad ripas fl. Indi in planitie elatâ Tibetanâ, "Tibet-Grass of Moorcroft," *Falconer in litt. ad Prof. Royle*.

Obs. Affines *C. verna*, Schk., *C. conglobata*, Kit. Differt spicis congestis nunc apice masculis evaginatibus, bractea abbreviatâ, perigyniis enerviis bifidis pellucidè punctatis, foliis glauco-viridibus demùm flavis.

17. *C. TENUISSIMA*, spicis 2 v. 3 erectis pedunculatis : terminali masculâ cylindricâ : reliquis fœmineis oblongis laxè paucifloris exsertè pedunculatis vaginatis remotis, stigmatibus 3, perigyniis trigono-ovovatis brevissimè conico-rostratis rostro recto ore emarginato leviter nervosis squamam æquilatam mucronatam ferrugineam æquantibus.

C. panicea? *Bunge in Herb. Fielding*.

Hab. in Chinâ Boreali, *Bunge*.

Obs. Affinis *C. paniceæ*, L., satis foliis filiformibus, squamis fœmineis mucronatis, perigynii rostro recto, distincta.

March 3.

Edward Forster, Esq., V.P., in the Chair.

Read a paper "On the Aqueous Vapour, and on the dark colour of the Wax, in Bee-hives." By George Newport, Esq., F.R.S. &c. Communicated by the Secretary.

The author directs attention in this paper to the transpiration of

vapour from the interior of bee-hives at certain seasons of the year, an occurrence which, he remarks, has almost escaped the observation of naturalists. He also recalls to the notice of the bee-keeper that at the latter end of summer there is often a deposit of dark-coloured matter on the foot-stool, or on the alighting-board at the entrance-hole of the hive, extending a few inches from it. This deposit the author at first believed to be occasioned by shattered pollen or by rejected excrementa, but he was afterwards convinced that it does not arise from either of these causes. He believes it is occasioned by small quantities of wax, which, adhering to the feet of the bees when they leave the combs, become deposited on the floor at the entrance as the bees leave the hive; and the darkened colour which this deposit acquires he thinks is due to the same cause as that which changes the appearance of the combs in the interior. This, he suggests, may depend on some chemical effect produced in the wax by the respired air of the hive. Part of the carbonic acid which necessarily results from the respiration of the bees on the combs may become chemically combined with the wax, composed, as it actually is, of nearly eight-tenths of its whole weight of carbon, and it may thus acquire the darkened colour from the surcharge of its chief constituent, the affinity being promoted by the elevated temperature of the hive.

In the autumn, when a hive is examined early in the morning, after the bees have been in a state of activity during the preceding day, and more especially when the temperature of the preceding night has been low, there is often a quantity of fluid draining from the entrance-hole. The amount of this is dependent on the greater or less degree of activity of the bees, and consequently of their respiration and of the transpiration from their bodies.

Huber stated that the interior of the hive is ventilated by the *fanning* of the bees with their wings. This observation the author has confirmed; and he suggests the probability, that it is to the meeting of the two currents of introduced and expelled air, occasioned by this act of the bees, that the deposition of the vapour as fluid is due.

In order to ascertain the quantity of vapour condensed and expelled from a hive, he made experiments, which, as he remarks, although not free from objection, yet afford some indication of the amount. He cut off the bottom of a glass phial, and then accurately fitted the phial to the entrance-hole of a box-hive, in such a manner that both the expelled and the introduced air passed through it. During one night of nearly twelve hours, at the commencement of September, there was condensed within the phial nearly one drachm

and a half of fluid. The temperature of the external atmosphere, when the hive was examined at seven o'clock in the morning, was 59° F., and that of the hive, at some distance within the entrance, 69° F.

On another occasion, a few days afterwards, at about the same time in the morning, when the temperature of the atmosphere was 61° F., that of the vapour within the phial as it issued from the hive, but at nearly four inches' distance from it, was $71^{\circ}5$ F., while the interior of the upper part of the hive, as ascertained by a thermometer inserted through the top and undisturbed for several days, was only 69° F. The bees were then quiet at the top of the hive, but were in activity at the lower part. The temperature of the hive and the quantity of fluid thus seemed to depend on the amount of respiration consequent on the greater or less activity of the bees, as the author has shown respecting temperature in the 'Philosophical Transactions' for 1837.

On another occasion, when the bees were quiet and the temperature of the external atmosphere was only 41° F., that of the top of the hive was 54° F., but that of the vapour from the entrance-hole was 59° F. The quantity of fluid then condensed in the phial, during a night of twelve hours, was scarcely three minims.

These experiments seemed to show that the vapour is in the greatest quantity when the bees are most active, and in the least quantity when they are inactive; and the author believes that it is the carbonic acid, the result of respiration, and held in solution in this vapour, which occasions the darkened colour of the combs.

March 17.

The Lord Bishop of Norwich, President, in the Chair.

Mr. Samuel Osborn was elected a Fellow.

Read a paper "On the Siliceous Armour of *Equisetum hyemale*, L., with an account of its hitherto undescribed Stomatic Apparatus." By Golding Bird, Esq., A.M., M.D., F.R.S., F.L.S. &c.

Dr. Bird commences his paper by referring to the observations of Mr. Sivright on the large amount of silica contained in *Equisetum hyemale*, and those of Dr. Brewster on the general arrangement of

the siliceous masses on its surface and their action on polarized light. He then proceeds to describe minutely the structure of this siliceous armour. The fourteen longitudinal ridges on each joint of the stem are each furnished with two parallel rows of siliceous tubercles, having the lustre and general appearance of glass beads; and along the margins of each ridge are numerous longitudinal wavy lines, which fill up the intervals between the lateral aspects of the ridges and the centres of the contiguous furrows. In the depressions of these furrows is seen a double vertical series of oval projections, arranged in pairs, each furnished with an oval fissure, having its longer axis placed transversely; these fissures lead to the complex stomatic apparatus.

Dr. Bird details the manipulations, consisting of maceration in water, boiling in strong nitric acid, careful scraping away of the disorganized cellulo-vascular structure, washing, boiling again in nitric acid, and again washing in water, which he considers necessary for the perfect exhibition of the minute structure of the stomata. After a portion of the stem has undergone these processes, the siliceous structures previously observed become much more obvious and distinctly marked. On reversing the preparation so as to obtain a view of its inner surface, the portions corresponding to the rows of tubercles are found to be nearly opaque, owing to a compact series of linear masses of siliceous matter combined with some still remaining organic structure. Equidistant from these linear masses are seen the posterior aspects of the stomatic apparatus, each presenting an ovate nipple-like prominence having its longer axis corresponding with that of the stem, and consequently opposed to that of the external fissure, into the base of the conical eminence surrounding which these ovate bodies are fitted.

Further manipulation is necessary to carry this investigation into the more minute details; and Dr. Bird has recourse to heat, applied by holding the piece of *Equisetum* prepared as already described in the flame of a spirit-lamp, in order to get rid of the minute portion of organic matter still remaining in the preparation. After acquiring a red heat, the preparation finally assumes a snowy whiteness; it is then placed between two slips of glass, which reduce it by breaking into fragments of a size sufficiently small to allow of careful examination by high powers of the microscope. The transverse fissure leading externally to the stomatic apparatus is found to have been widened and rendered irregular by the heat. On bringing this fissure within the focus, it is seen to be replaced by one having its longer axis in the opposite direction, which is derived from the oval

figure of the apparatus at its base. Among the fragments may be seen numerous separated specimens of the stomatic apparatus. This is described by Dr. Bird as oval in outline, nearly flat, and measuring in its long diameter $\frac{1}{250}$ th of an inch. It consists of a frame of silex formed of two pieces, thick at their convexities, thin at their concavities, nearly touching above and below, and grasping between them two long and flat structures, fissured (apparently) in a pectinate manner, and tapering from their middle towards either end. In most specimens an opening exists between these structures; in others they are quite in contact. In some the thinner and laminated portions of the frame are perforated by three well-defined apertures, but this is by no means constant. The apparatus thus consists essentially of four pieces, viz. two curved frames with their laminæ and two linear pectinated structures; and these are placed at the base of a conical eminence opening by a transverse fissure. By what means it is retained in its position Dr. Bird has not been able satisfactorily to ascertain.

April 7.

Edward Forster, Esq., V.P., in the Chair.

Thomas Henry Brain, Esq., LL.D., and Charles Cæsar Corsellis, Esq., M.D., were elected Fellows.

Read a "Note on the Generation of *Aphides*." By George Newport, Esq., F.R.S., Fellow of the Royal College of Surgeons, &c.

In this note the author states his object to have been the verification by his own observations of those made by Leeuwenhoek, Bonnet, Reaumur and others, preparatory to attempting hereafter to show the accordance of those observations with some universal law of reproduction. The points to which his attention was more particularly directed were, *first*, whether the *Aphis* is really viviparous at one season and oviparous at another; and *secondly*, whether the supposed ova are true eggs, or, as some have imagined, merely capsules designed for the protection of the already-formed embryos during the winter season.

On the 30th of November Mr. Newport observed the deposition of the egg by the female *Aphis*, and found it to be a true egg, similar

to that of other insects, composed of an orange-coloured yolk, formed of yellow nucleated cells, surrounded by a very small quantity of transparent vitelline fluid, and containing a very large germinal vesicle with a distinct macula or nucleus. On the 2nd of December the females were again seen to produce living young, and Mr. Newport describes the process of parturition which he then observed. These observations confirm the statements of former naturalists on both the points inquired into, and negative the presumption raised with reference to the capsular character of the egg by proving it to possess all the characters of a true ovum.

Read also a portion of Dr. Buchanan Hamilton's "Commentary on the 8th book of the *Hortus Malabaricus* of Rheede."

April 21.

Edward Forster, Esq., V.P., in the Chair.

Mr. Ward, F.L.S., exhibited specimens of the dried plant and fruit of *Uncaria procumbens*, Burchell, from South Africa; and also a portion of the stipes of a fern from New Plymouth, New Zealand, probably belonging to *Pteris esculenta*, Sol., measuring several feet in length. Mr. Carrington, from whom the latter specimen was obtained, stated that the species of fern from which it was obtained grows, in the neighbourhood of the coast, to the height of five feet, in masses of from six to seven feet diameter, so strong and dense as to be capable, if a cover were thrown over it, of sustaining the weight of a man. On the margin of the bushland it attains a height of twenty-one feet, and Mr. Carrington has observed it on the banks of a river, when interlaced and matted together, to measure thirty feet.

Read a paper "On the Development of Starch and Chlorophylle." By Edwin John Quekett, Esq., F.L.S. &c.

Mr. Quekett commences by referring to the observations and opinions of Müller, Münter and Nägeli on the subject of the formation of starch and chlorophylle in the cells of plants, and to his own observations, recorded in the 'Pharmaceutical Journal,' vol.iii. 1843-44,

on the growth of starch in the leaves of *Vallisneria spiralis*. Müller, he states, has observed that in the cells of *Chara crinita*, the cyto-blast becomes hollow, enlarges, and fills the cell-membrane in which it is contained, and ultimately becomes the reservoir for granules of starch; while Nägeli has observed that in *Caulerpa prolifera*, at the period of the formation of starch, the cells contain several smaller cells, in each of which are developed generally from three to four grains of starch. In order to observe the growth of starch and chlorophylle, Mr. Quekett examined in several plants the organs in which those substances are generally situated, and found that their formation took place, in the majority of instances, in the following manner.

In the very young stem of *Circæa Lutetiana*, or the young branch of the Grape-Vine, the different appearances presented by the grains of starch from their perfect state down to their first commencement may be readily observed by making numerous sections from the lowermost internode up to the terminal joint. The cells most recently formed are so filled with mucilage and granules as to be opaque; lower down the granules begin to disappear and the cyto-blast is apparent; still lower the cyto-blast appears to have lost its granular character without having much increased in size, and has become a minute cell with a distinct nucleus, instead of a congeries of granules with a larger central one. On the *outside* of this nucleated cell, granules (varying in number from ten to twenty) make their appearance, at first very minute and of a green hue, and afterwards enlarging and becoming colourless; and as they increase in size the nucleated cell is absorbed and the granules become free. At a later period a multiplication of the granules takes place by fission and pullulation, certain grains exhibiting marks of subdivision, and others having minute granules attached to them; and generally more grains of starch are found in a cell than the number of minute granules seen developing on the nucleus.

Several of these stages are more readily seen in the tuber of the Potato. If a slice be removed from its exterior so thin as only to pass beneath the cuticle, and a very thin and perfectly transparent slice be then taken and examined under the microscope, the cells in the central portion are seen to contain only a few grains of starch, while in approaching the sides of the section the grains become smaller and pass gradually into the nature of chlorophylle. On directing attention to those parts of the section, in which the cell-contents pass gradually from the state of starch to that of chlorophylle, many cells are seen to contain a distinct nucleated cell, apparently of a flattened or lenticular form, on the edge of which are

arranged a number of minute granules ; in others the appearances are more advanced, the granules gradually becoming larger and the nucleated cell becoming obliterated. From the disturbance that takes place in the position of the granules after detachment from the nucleated cell, it is difficult to determine by what part they were adherent to it ; but Mr. Quekett believes that this adherence takes place at the end at which the point or hilum is observed. Subsequent to this period the grains of starch enlarge, become laminated, and are multiplied in the manner already pointed out by various observers.

Such are the results of Mr. Quekett's observations on Exogenous plants ; in Endogenous plants he states that the same process does not appear to be in all cases pursued, inasmuch as while the rhizoma of *Iris germanica* affords a favourable example for the exhibition of the process as above described, the young stem of *Lilium bulbiferum* offers the following differences. Sections taken from the base of a young stem within the bulb have their cells full of starch-grains ; at the height of an inch from the base of the stem, the cells are filled with fluid only, and each cell contains a cytoblast with its contents presenting a milky hue. Carrying on the sections from above downwards within these limits, the cells are first found to become more transparent and to contain granules with well-defined outlines ; lower down they exhibit minute granules mixed with the fluid of the cell, leaving the cytoblast transparent, empty and angular ; while at the base the granules have arrived at their perfect condition and the cytoblast is no longer visible. Thus it appears, Mr. Quekett states, that there are two modes of formation of starch connected with the cytoblast ; in the one case the cytoblast becomes a nucleated cell and the grains originate on its exterior ; in the other it does not become a nucleated cell, but gives origin to the grains in its interior.

As regards the origin of chlorophylle, Mr. Quekett states that in the plants which he has examined the same mode of development appears to obtain as described in the formation of starch, viz. the granules originating from a nucleated cell, and instances the cuticle of the very young frond of *Scolopendrium vulgare*, L., as an example ; but he adds that the first origin of chlorophylle is so mixed up with the formation of the cell, that it is impossible to arrive by dissection at the commencement of the process.

May 5.

The Lord Bishop of Norwich, President, in the Chair.

Read a letter "On the Migration of the Swallows," addressed to the Secretary. By Thomas Forster, Esq., M.D., F.L.S. &c., dated Bruges, May 2nd, 1846.

The object of this note is to show, not only that the four British species of Swallows migrate, but also that their migration is progressive through Europe to Asia and Africa. The first table is stated to have been compiled from the recorded observations of naturalists and others, copied on the spot during an extensive tour through Europe in the years 1833, 1834, 1835 and 1836. Dr. Forster states that he is satisfied that numerous flights of the several species annually arrive at the end of February and beginning of March in Sicily, Italy and the Islands of the Mediterranean, from Africa. Of these a portion proceed after a few days' rest towards the north, leaving colonies in different places as they advance, until they reach their most northern destination in Europe. In autumn they retire in the same manner, and their numbers appear prodigiously increased in particular places where they halt and rest for days before the phalanx again takes wing. This, Dr. Forster states, is also the case with Quails, with the Mountain-Finch, and with many of the Warblers. Particular places seem to be favourite resorts as resting-places to particular species, as Pisa for example to the Swift, the Campagna and Southern Italy to the Martin. When an early spring has occurred in the S. of Europe, these birds have made their appearance earlier, as if they had been capable of inferring an earlier season northwards.

TABLE I.

Mean time of Arrival.

| Species. | Naples. | Rome. | Pisa. | Vienna. | Bruges. | London. |
|-------------------------|----------|----------|----------|----------|----------|----------|
| <i>Hirundo rustica</i> | Feb. 27 | March 3 | March 5 | March 25 | April 5 | April 15 |
| <i>H. urbana</i> | April 10 | April 15 | April 16 | April 20 | May 1 | May 1 |
| <i>H. riparia</i> | April 3 | April 5 | April 8 | April 12 | April 25 | April 25 |
| <i>H. Apus</i> | April 15 | April 18 | April 20 | April 25 | April 30 | May 3 |

In their recession in autumn they observe nearly the same relative times, with the exception that the Swifts migrate much earlier in Flanders than they do in Kent and Sussex. They are often gone on the 1st of August, and always about the 5th, whereas they remain in England until about the 15th.

The second Table is copied from the Journal kept in succession by Dr. Forster's late father, T. F. Forster, Esq., F.L.S., and himself; and records the period of arrival of the Swallow (*Hirundo rustica*, L.) for nearly half a century. Dr. Forster hopes on a future occasion to supply similar tables of the Martin, Swift, and other birds of passage.

TABLE II.

Showing the day of Arrival of the Swallow for forty-seven years.

| | | | |
|----------------|----------------|----------------|---------------|
| 1800, April 15 | 1812, April 15 | 1824, April 14 | 1836, April 6 |
| 1801, — 5 | 1813, — 15 | 1825, — 19 | 1837, — 6 |
| 1802, — 15 | 1814, — 19 | 1826, — 14 | 1838, — 13 |
| 1803, — 15 | 1815, — 14 | 1827, — 22 | 1839, — 15 |
| 1804, — 17 | 1816, — 21 | 1828, — 23 | 1840, — 15 |
| 1805, — 5 | 1817, — 10 | 1829, — 21 | 1841, — 5 |
| 1806, — 2 | 1818, — 17 | 1830, — 16 | 1842, — 5 |
| 1807, — 15 | 1819, — 15 | 1831, — 12 | 1843, — 21 |
| 1808, — 16 | 1820, — 16 | 1832, — 19 | 1844, — 16 |
| 1809, — 18 | 1821, — 18 | 1833, — 17 | 1845, — 8 |
| 1810, — 20 | 1822, — 17 | 1834, — 1 | 1846, — 1 |
| 1811, — 18 | 1823, — 22 | 1835, — 7 | |

Read also a note "On the Structure of *Viola*, in connection with its Impregnation." By T. S. Ralph, Esq., A.L.S. &c.

Mr. Ralph regards the following circumstances as more or less essential to the impregnation of the ovules of *Viola*: 1st, the pendent position of the flower, which brings the stigma into a position below the anthers; 2ndly, the spurred petal, which by the secretion of honey attracts insects, whose efforts to obtain a supply of nutriment disturbs the whole band of coherent anthers through the movements impressed on the two spurs of anthers which descend into the nectary, and thus cause a free discharge of pollen; 3rdly, the rostrate termination of the stigma in some species, in which the pollen is shed very freely and appears to have a ready access to the interior of the stigma; 4thly, the remarkable bend in the style in those species which have a globose stigma, in which species Mr. Ralph has also found a set of singular hairs seated on the claw of the fifth or spurred petal, on which the pollen collects very abundantly, and thence probably finds its way into the interior of the stigma; the stigmatic head being readily capable of being pushed into the groove of the claw of the petal amid these hairs, a process which Mr. Ralph thinks is performed by the assistance of insects. In some species there are also a set of hairs placed at the throat of the corolla on the two middle petals, the use of which Mr. Ralph thinks to be to shut out the ingress of the proboscis of the insect in that direction.

May 24.

The Lord Bishop of Norwich, President, in the Chair.

This day, the Anniversary of the birth of Linnæus, and that appointed by the Charter for the election of Council and Officers, the President opened the business of the Meeting and stated the number of Members whom the Society had lost during the past year, of some of whom the Secretary read the following notices:—

James Hussey Abraham, Esq., for nearly half a century the conductor of the most flourishing seminary in the town of Sheffield, was well-skilled in various branches of Natural Philosophy, especially Electricity and Magnetism, and possessed a large and valuable collection of apparatus with which he illustrated his lectures on these and allied branches of science. In the course of his magnetic experiments, the idea suggested itself to him that the minute particles of steel evolved in the dry grinding of forks, needles, &c., the inhalation of which is so deleterious to the workmen engaged in those trades, might be intercepted by means of a wire-gauze mask, or caught by a chaplet of magnets worn about the mouth of the operator. For the ingenious contrivance by which he proposed to effect this object, he received in 1821 the large gold medal of the Society of Arts. Other ingenious modifications of the practical application of the magnet were also devised by Mr. Abraham; and he delivered a lecture on this, his favourite topic, at an evening meeting of the British Association, at their first meeting in the city of York in 1831. In conjunction with his friend James Montgomery the poet, who then edited one of the local newspapers, he was mainly instrumental in originating the Literary and Philosophical Society of Sheffield, of which in 1834 he was elected President. He was also celebrated in his neighbourhood for his skill in horticulture, and seldom failed to carry off one or more prizes at the exhibitions of the Sheffield Horticultural Society, founded in 1830 by himself and some friends; the prize medals of which Society bear on their obverse an exquisitely engraved head of Linnæus. Mr. Abraham died on the 5th of February in the present year, in the 69th year of his age. He became a Fellow of the Linnean Society in 1825.

Henry Singer Chinnock, Esq.

Barron Field, Esq., was born on the 23rd of October 1786. He was the second son of Mr. Henry Field, who was in extensive medical practice in London, and for many years apothecary to Christ's

Hospital. Mr. Barron Field was lineally descended in the sixth degree from Oliver Cromwell; his grandfather, Mr. John Field, having married Anne, the daughter of Thomas Cromwell, who was grandson of Henry Cromwell, Lord Deputy of Ireland, the younger son of the Protector. Mr. Barron Field was educated for the profession of the law, and called to the bar by the Honourable Society of the Inner Temple. In 1811 he published an 'Analysis of Blackstone's Commentaries,' which has become a standard work for the use and instruction of students. In 1816 he was appointed Judge of the Supreme Court of New South Wales, and continued to exercise the duties of that office till 1824; when, on a change in the Charter of Justice for that colony, he relinquished his appointment and returned to England. Early in 1829 he received from Government the appointment of Chief Justice of Gibraltar, which he held until ill-health obliged him to retire and return to his native country. In both these distant appointments Mr. Barron Field applied himself to what was always with him a favourite relaxation, the study of botany. In New South Wales he availed himself of the talents of Mr. Lewin, the distinguished painter of natural history, and formed a pleasing collection of drawings of Botany Bay plants; and his garden at Gibraltar, situate at nearly the most southern point of Europe, exhibited fine specimens of geraniums, cacti and other beautiful plants, flourishing in an almost natural state. Mr. Barron Field also dedicated much of his leisure to the critical perusal of the early English dramatists and poets; and latterly attached himself to the Shakspeare Society, of which he was chosen one of the Council, and for which he edited several old dramas. He died on the 11th of April 1846, in his 60th year, at Torquay in South Devon, where he had resided for the last two years.

During his residence in New South Wales he published a small volume of poems, the first that had ever been printed in that colony, which he subsequently included in a collection of 'Memoirs on New South Wales,' containing, among several geographical papers of interest, some notes by Allan Cunningham on the Botany of New Holland. He became a Fellow of the Linnean Society in 1825.

The Rev. Thomas Gisborne, Prebendary of Durham, a name distinguished in the literature of our country, was attached from early life to the pursuit of natural history, to which his 'Rural Walks,' first published in 1795, bear in many passages ample testimony. It is not necessary to speak here, and indeed it would be out of place to do so, of the value of his ethical and religious writings; but he well deserves mention as one of the most zealous collectors of rare Bri-

tish birds, and for his great liberality to the Durham Museum, of which he was one of the founders and principal patrons. The fine collection of British birds, which forms the foundation of that Museum, was munificently purchased and presented to the Institution by him, and he never missed an opportunity of adding to its value and completeness by supplying its deficiencies in the rarer species. He became a Fellow of the Linnean Society in the year 1799, and died in the spring of the present year.

Robert Graham, M.D., Regius Professor of Botany in the University of Edinburgh, was the third son of Dr. Robert Graham, and was born at Stirling on the 7th of December 1786. In the first part of his career he practised medicine in Glasgow, and in 1818 he was appointed to the Professorship of Botany then first established by the Crown as a distinct chair in the University of that city. In 1820 he was transferred to the Botanical chair of the University of Edinburgh, which he filled up to the time of his death. In the same year he became a Fellow of the Royal Society of Edinburgh, and in 1821 of the Linnean Society.

Dr. Graham devoted himself assiduously and successfully to the duties of his office. By his energy and enthusiasm, as well as by his affable and pleasing manners, he succeeded in implanting a taste for his favourite science among the pupils of his class, many of whom have since become able teachers, as well as zealous students and collectors. In the promotion of this taste he derived much assistance from the botanical excursions which he made in company with his pupils, not merely in the neighbourhood of Edinburgh, but in distant parts of Scotland, and even in England and in Ireland, in the course of which several additions were made to the Scottish flora. During these excursions he also laid in a large store of materials for a Flora of Britain, in the preparation of which he had been long engaged, but which he did not live to complete. His published works consist chiefly of descriptions of new or rare plants from the Edinburgh Botanic Garden, which owes much of its present excellence to his exertions. These descriptions, together with notices of his botanical excursions, appeared in the 'Edinburgh New Philosophical Journal' and in the 'Botanical Magazine.' In the 'Companion' to the latter work, published by Sir Wm. J. Hooker, he also gave "an account of the Camboge-tree of Ceylon." His favourite tribe was the *Leguminosæ*, and he had undertaken to describe the plants of that extensive family contained in Dr. Wallich's Indian herbarium, but subsequently relinquished the intention and transferred the plants to Mr. Bentham, who has made considerable progress in their illustration.

The genus *Grahamia* jointly commemorates the botanical merits of Mrs. Graham, afterwards Lady Callcott, and those of Dr. Graham; and several species have also been named in honour of the latter. He died on the 7th of August last at the house of his brother at Coldoch in Perthshire, after a long and painful illness, leaving behind him the character of an able and enthusiastic teacher, a warm and zealous friend, and a candid and honourable man.

In *Joseph Janson, Esq.*, the Society has lost a very active and zealous member. He was born at Tottenham in Middlesex on the 12th of July 1789, and became a Fellow of the Linnean Society in November 1831. Before his election into the Society, he contributed towards the purchase of the Linnean collections, and it was owing in a great degree to his exertions that the subscription was set on foot which has enabled us to pay off so large a portion of our debt. The Society has since been indebted to Mr. Janson for a valuable set of cabinets for its herbarium, and for the cabinet which contains the principal part of the collection of fruits which have been so carefully arranged by Mr. Kippist. To the library also he has presented upwards of forty volumes of local European floras; and he was always ready to add to our collections, or to aid in giving interest to our meetings by the exhibition of rare and curious specimens from his garden at Stoke Newington, where, in addition to the more usual garden plants, he was particularly successful in the cultivation of the rarer and less determinately settled British species.

Mr. Janson was, as many now present can well bear testimony a man of cultivated understanding, of a clear head and a warm heart. He was ever ready to perceive and to acknowledge merit, and it was one of his benevolent pleasures to bring forward young men of talent and to put them in a way of making their abilities available. He was a zealous friend of various establishments for the education of the poor, to the promotion of the objects of which he devoted much time and labour as well as rendering pecuniary assistance. He was never married. He died on the 30th of April in the present year after a long illness, which did not assume a dangerous appearance until about a fortnight before his death. By his will he has bequeathed to the Society a legacy of 100*l.*

Henry Gally Knight, Esq., M.P., distinguished for his extensive acquaintance with the architecture of the middle ages, on which he published several highly beautiful and important works. He was educated at Eton and afterwards at Trinity College, Cambridge, where he formed an acquaintance with Byron, which he renewed during a tour in the East in 1810-11, and which probably led to

his attempting poetry in a series of new 'Persian Tales.' These, however, met with little success, and he devoted himself during the latter years of his life to the more congenial study of mediæval architecture. He was returned to parliament in 1834 for North Nottinghamshire, for which he continued to sit till the time of his death, which occurred on the 9th of February in the present year, and in the 59th year of his age. He became a Fellow of the Linnean Society in 1818.

Richard Latham, Esq., received the rudiments of his education at Christ's Hospital, and in grateful recollection of the benefit, devoted the first four hundred pounds which he saved by industry and frugality to the uses of that noble institution. He became connected with the extensive brewery of Sir Henry Meux and Co., of which for more than a quarter of a century he was acting partner. In this position he acquired considerable wealth; while he amused his leisure hours with the pursuits of chemistry, geology, botany and ornithology. He also contributed largely to the funds of many of the most important charitable institutions of the metropolis. He became a Fellow of the Linnean Society in 1821, and died at his residence at Bayswater on the 24th of January in the present year, and in the 79th year of his age.

Thomas Knowlton, Esq., the son of a father of the same names, who was in the early part of his life gardener to Sherard, and afterwards to the Earl of Burlington, and who is mentioned with honour in Pulteney's 'Sketches of the Progress of Botany in England' as an antiquary as well as a naturalist. Our deceased member inherited his father's taste for natural history, and formed a valuable botanical and zoological library, which was disposed of by auction on the death of its proprietor in the spring of the present year. The elder Knowlton died in 1784 at the advanced age of 90, and his son, who became a Fellow of the Linnean Society in 1795, must also have reached a good old age.

Charles Lush, Esq., M.D., was educated as a surgeon, and the first bent of his mind towards natural history was given in a small society of juniors to which several of our Fellows who have since distinguished themselves also belonged. He became the Botanical Lecturer at St. Thomas's Hospital in 1825, and in 1827 sailed for India as an Assistant-Surgeon in the East India Company's service on the Bombay establishment. Soon after his arrival he was appointed to take charge of the Botanic Garden at Dapooree near Poona, which appointment he retained until his return to England in 1837. In 1829 he was employed by the Bombay Government in travelling in

the Southern Mahratta country, along the coast of Canara, and visiting the Portuguese settlement of Goa, &c. in order to select a suitable spot for the establishment of an experimental cotton-farm. His report of the results of this journey was published with the approbation of the authorities, and circulated among all the magistrates and other functionaries. From 1830 to 1833 he had the direction of some experiments in the cultivation of silk and cotton carried on in the Southern Provinces, and in 1833 made a report to the Government respecting mulberries for the feeding of the silk-worms. In 1836 he visited the cotton districts in Guzerat, for the purpose of inspecting the different farms, on the subject of which he furnished a report; and in the same year he communicated to the Medical and Physical Society of Bombay, a paper published in December in the 'Journal of the Asiatic Society of Bengal,' entitled "Geological Notes on the Northern Conkan, and a small portion of Guzerat and Kattywàr." In this paper he mentions the discovery by himself in the Island of Perim, in the Gulf of Cambay, of a large deposit of fossil bones, which has since been more fully investigated by Capt. Fulljames and Dr. Falconer, and has been found to comprise some of the most remarkable among the very extraordinary fossils for the knowledge of which we have recently been indebted to the naturalists of India.

In 1837 he returned to England overland, and in 1840 again proceeded to India, where he was appointed surgeon to the 14th Bombay Native Infantry, and accompanied that regiment in 1844 to Kurachee in Scinde, and in 1845 to Hydrabad, where he fell a victim to spasmodic cholera on the 4th of July, in the 49th or 50th year of his age.

In character Dr. Lush was well-known to many of our members as warm-hearted, sincere, and of so sweet a disposition, that I am assured by one of our Fellows who knew him best, that during a close intimacy of many years he never saw him out of temper. He was a constant peacemaker, and his simplicity was extraordinary. His talents were excellent, and had his application been equal, there is no doubt that he would have attained a high position in science.

Peter Nouaille, Esq.

Of our *Associates* we have lost two during the past year.

Mr. James Main began life as a working gardener in the neighbourhood of Edinburgh, and was afterwards employed by Mr. George Hibbert, to whom we are indebted for the introduction of many valuable plants through the means of collectors whom he sent abroad.

One of these was Mr. Main, whom he despatched to China, and who continued in Mr. Hibbert's employ for some years after his return to England, but afterwards took a farm in Scotland. Here he was unsuccessful; but having made himself well-acquainted with the received theories and practice both of horticulture and of agriculture, he turned his attention to the literature of those subjects, and from this time forwards became a frequent and welcome contributor to some of the principal periodicals devoted to their illustration. In the year 1830 he published 'The Villa and Cottage Florist's Directory,' which reached a second edition in 1835; in 1833 'Illustrations of Vegetable Physiology, practically applied;' in 1835 'Popular Botany;' and in 1839 'The Young Farmer's Manual,' and 'The Forest Planter's and Pruner's Assistant;' and he also edited new editions of Mawe's 'Every Man his own Gardener,' and of several other works of a similar character.

Mr. Main was elected an Associate of the Linnean Society in 1829, and communicated to us in 1844 a paper entitled "Remarks on Vegetable Physiology," in which he reproduced the leading ideas on the growth of plants contained in his 'Illustrations of Vegetable Physiology.' Of this paper an abstract is published in the 'Proceedings' of the Society. He died at Chelsea in the spring of the present year at an advanced age.

Mr. George Samouelle was brought up to the business of a bookseller, and was for several years an assistant in the establishment of Messrs. Longman and Co. He early imbibed a taste for natural history, and more especially for entomology, and became an assiduous collector of British insects. In 1819 he published a work entitled 'The Entomologist's Useful Compendium, or an Introduction to the Knowledge of British Insects, comprising the best means of obtaining and preserving them, and a description of the Apparatus generally used; together with the genera of Linné, and the modern method of arranging the Classes *Crustacea*, *Myriapoda*, *Spiders*, *Mites* and *Insects*, from their affinities and structure, according to the views of Dr. Leach. Also, an explanation of the terms used in Entomology; a Calendar of the times of appearance and usual situations of near 3000 species of British Insects; with instructions for collecting and fitting up objects for the Microscope. Illustrated with twelve plates,' Svo, Lond. In this work, the multifarious nature of which may be inferred from the title-page, Mr. Samouelle furnished the British entomologist with a careful and valuable compilation, and added moreover numerous original observations calculated to be useful to the collector; but the greater part of the work, as well as

the most important in a scientific point of view, was derived from the MSS. of Dr. Leach, which were freely communicated to the author. This work was followed by 'General Directions for collecting and preserving Exotic Insects and Crustacea,' 18mo, Lond., 1826. Soon after the publication of his 'Compendium' Mr. Samouelle became an assistant in the Natural History Department of the British Museum, and was chiefly employed for many years in the care and arrangement of the entomological collections of that establishment. In 1832 he commenced the publication of an illustrated periodical, entitled 'The Entomological Cabinet; being a Natural History of British Insects,' of which he completed two annual volumes. He afterwards issued two numbers of a second series of the same work, but not meeting with sufficient encouragement he proceeded no farther. In 1836 he also published two numbers of a second edition of his 'Entomologist's Useful Compendium,' but this undertaking fell to the ground from the same cause. He was elected an Associate of the Linnean Society in 1818, and died at Lambeth in the spring of the present year.

His principal work was highly useful at the time of its appearance, following as it did on the two introductory volumes of Messrs. Kirby and Spence, and affording to the numerous students who were incited by those volumes to take up entomological pursuits, a manual of information for their guidance in collecting, preserving and arranging insects, which was then greatly wanted by British entomologists.

The Secretary also announced that twelve Fellows had been elected since the last Anniversary.

At the election, which subsequently took place, the Lord Bishop of Norwich was re-elected President; Edward Forster, Esq., Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out: viz. Sir Henry Thomas De la Beche; Hugh Falconer, M.D.; Joseph Dalton Hooker, M.D.; William Wilson Saunders, Esq., and William Yarrell, Esq.

June 2.

E. Forster, Esq., V.P., in the Chair.

Read some "Notes towards a Statistical Account of the Fauna of New Zealand and the Auckland Islands, so far as regards Annulose Animals." By Adam White, Esq., M.E.S., Assistant in the Zoological Department of the British Museum. Communicated by the Secretary.

In these notes, Mr. White remarks on the advantages offered by an insular position, of comparatively limited extent and far removed from any great continent, in the drawing up a local fauna or flora; and anticipates that in the course of time, when we shall have been furnished with nearly perfect lists of the animals and vegetables inhabiting New Zealand, we may arrive at tangible results regarding them, free from the disturbing influences which result from the great extent and varied nature of such a continent as New Holland, and from the ready access afforded to wanderers of both kingdoms by the proximity of such islands as our own to great and almost adjoining continents. He limits his present observations to the Coleopterous order of insects, and states the sources from which the various collections examined by him have been derived. From the information which he has been enabled to acquire from all these sources he arrives at the following conclusions:—1st, that *Coleoptera* do not abound in species in New Zealand; 2ndly, that the numbers of *Cicindelidæ*, *Carabidæ*, *Curculionidæ* and *Longicornes* are strikingly characteristic of its Coleopterous fauna as compared with any part of New Holland; and 3rdly, that *Cetoniadæ*, *Buprestidæ* and *Chrysomelidæ*, so abundant in nearly every part of the Australian continent, are either wanting or very poorly represented in New Zealand. He does not, however, venture in the present state of our knowledge to propound these as axioms; and instances the paucity of species of various orders of insects, especially *Hymenoptera* and *Neuroptera*, enumerated in the 'Fauna Boreali-Americana,' as compared with the large number of species of those orders collected by Mr. Barnston in a single locality within the limits of that territory, as a striking example of the fallacy of the conclusions which might be drawn from insufficient and uncertain data.

The author then proceeds to give an enumeration of the species of each Coleopterous family hitherto detected in New Zealand; and ob-

serves in a note that the *Æshna liassina* of Strickland, a Neuropterous insect, of which a lower wing has been found in the lias of Stonesfield, belongs (as Mr. Dale has conjectured) to a genus closely allied to *Petalura*, which latter has hitherto only been detected living in New Zealand and New Holland.

June 16.

The Lord Bishop of Norwich, President, in the Chair.

John Birkett, jun., Esq., and Thomas Lightfoot, Esq., M.D., were elected Fellows.

Read a paper "On the calcifying functions of the Cowry and the Olive, two genera of Pectinibranchiate Mollusks." By Lovell Reeve, Esq., A.L.S. &c. &c.

After referring to the numerous instances of very considerable modifications in the form of shell and mode of calcification which occur among *Mollusca*, even in genera very nearly related to each other, Mr. Reeve proceeds to describe more particularly the manner in which the calcifying process is performed in the two genera which form the subject of his paper. Each of these genera produces a porcellanous shell of very analogous structure, consisting of a cylinder of several enlarging whorls, convoluted on a plane nearly vertical to the spire, and composed of layers of vitrified enamel of different colours and design; but there is a striking difference in the calcifying organ as regards its structure and its function of secretion. In the Cowry the office of calcification is performed by a lobate expansion of the mantle from either side of the aperture, sufficiently large to cover the entire shell, and retracted only under the influence of alarm. In the Olive, on the other hand, the mantle is limited to the interior and the aperture of the shell; and appears to be furled over the edge of the lip, and retained in a state of tension by a cord or filament passing from its posterior extremity into a narrow channel which is excavated round the spire of the shell in place of the suture. The result of this difference in the condition of the calcifying organ is, that in the Cowry the testaceous secretion is deposited over the whole shell from the outside in successive layers at different intervals of time, while in the Olive the layers must be secreted simultaneously at the lip alone, and the porcellanous surface of the shell

is preserved (both in its course of retrovolution and after maturity) by a reflection of the ventral disc somewhat analogous to the reflected mantle of the Cowry, but bearing no part in the formation of the shell.

In support of this view and with the view of proving that this distinction is borne out by the physical condition of the shells at different periods of growth, the author takes for examples *Cypræa Tigris* and *Oliva Utriculus*. The Tiger Cowry in its first stage is of a uniform light chestnut-bay; the colour then breaks up, as it were, into bands of close-set blotches of a richer hue; a coating of white is next superposed, and upon that is deposited a series of rather distant zigzag flames; these are partially concealed by a second layer of white enamel thinner and more delicate than the preceding one, on which a number of dark spots are subsequently deposited; and a third coating of white enamel, with a new layer of black and brown spots intermingled, characterizes the maturity of the shell. Each period in the life of the Cowry appears therefore to be distinguished by a different design of colouring; but this is not the case with the Olive, the shell of which exhibits the same appearance at all stages of its growth, and the different layers of its colouring matter must be deposited simultaneously because the organ of calcification extends only to the lip, from which the shell gradually recedes in the progress of its growth. The external coating of *Oliva Utriculus* is of an obscure milky-blue, and the removal of this layer by means of an acid reveals a dull ashy ground sprinkled with numerous triangular opal-like dashes; in *Oliva Brasiliensis* the removal of the outer layer exhibits a longitudinally striped pattern, and other varieties of design may be found in different species; but there is no periodical change of colour in the entire shell to mark its advancement in growth.

November 3.

R. Brown, Esq., V.P., in the Chair.

Arthur Grote, Esq., was elected a Fellow.

Read a "Description of the Asafœtida plant of Central Asia."
By Hugh Falconer, Esq., M.D., F.L.S. &c. &c.

Dr. Falconer describes the plant which yields the Asafœtida under the following characters:—

Ord. UMBELLIFERÆ.

Trib. PEUCEDANEÆ.

Gen. NARTEX, *Falc.*

Calycis margo obsoletus. *Petala* ? *Stylopodium* plicato-urceolatum. *Styli* filiformes demùm reflexi. *Fructus* a dorso plano-compressus, margine dilatato cinctus. *Mericalypia* jugis primariis 5, 3 intermediis filiformibus, 2 lateralibus obsoletioribus margini contiguis immersis. *Vittæ* in valleculis dorsalibus plerumque solitariæ (valleculis lateralibus nunc sesqui- vel bi-vittatis); commissurales 4—6 variæ inæquales, exterioribus sæpè reticulatim interruptis. *Semen* complanatum. *Carpophorum* bipartitum. *Umbellæ* pedunculatæ, compositæ. *Involucrum* utrumque nullum.—*Genus* inter Peucedaneas *calycis* margine edentato; *fructûs* vittis magnis, commissuralibus inæqualibus; involucroque utroque nullo distinctum. *Narthen* nuncupatum a vocabulo $\nu\alpha\rho\theta\eta\xi$, apud *Dioscoridem* *Ferulæ* attributo.

N. ASAFÆTIDA, caule tereti simplici petiolis dilatatis aphyllis instructo, foliis radicalibus fasciculatis; petiolis trisectis; segmentis bipinnatisectis: laciniis lineari-lanceolatis obtusis inæquilateralibus integris vel variè sinuatis decurrentibus.

Asafætida Disgunensis, *Kæmpf. Amœn. Exot.* p. 535.

Ferula Asafætida, *Linn. Mat. Med.* p. 79; *Dec. Prodr.* iv. 173; *Lindl. Fl. Med.* p. 45.

Hab. in apricis inter saxa in valle "Astore" vel "Hussorah" dictâ prope Indum ultra Cashmeer; indigenis Daradris "Sip" vel "Süp" dictum. Legi fructigerum prope Boosthôn die 21^{mo} Septembris 1838.

Dr. Falconer states that he has compared his materials with Kæmpfer's description and figures and with the original specimens of that author in the collection of the British Museum, and found them to agree, so far as a comparison could be instituted, in every essential particular. Jubbar Khan, the Dardoh Rajah of the country in which Dr. Falconer gathered his specimens, at once recognised the plant as that which furnishes the *Heeng* or Asafætida of commerce, and referred to the medicinal accounts given of it by the Persian and Arabic authors; but the Dardohs are a wild race and do not collect the gum-resin for exportation. Some young roots were carefully removed and introduced in the first instance into the Botanic Garden at Saharunpoor, but afterwards transferred to the subsidiary hill garden at Mussooree. Of these some had succeeded well, but had not flowered up to the time of Dr. Falconer's leaving India; and one of these furnished the leaves which were represented in a figure accompanying the paper, together with a small quantity of Asafætida, differing in no respect from the ordinary condition of that substance as it occurs in commerce. The species is found, as

it would appear, in the greatest abundance in the Persian provinces of Khorassan and Laar; and thence extends on the one hand into the plains of Turkestan upon the Oxus, where it seems to have been met with by Sir Alexander Burnes, and on the other stretches across from Beloochistan, through Candahar and other provinces of Affghanistan, to the eastern side of the valley of the Indus in Astore. Dr. Falconer has not met with it in Cashmeer.

Besides the gum-resin, the fruits of the *Narhex Asafætida* are also imported into India for medicinal use, and along with them the fruits of another umbelliferous plant which Dr. Falconer found to belong to a true *Ferula*, and which are sold under the name of *Doogoo*; a word evidently connected with the Greek *δαῦκος*. Of these fruits he gives a description; and he also mentions another umbelliferous fruit in the collection of Dr. Royle, labelled as "the seed of the Wild Asafætida plant, collected and brought to England by Sir John MacNeill from Persia," which differs widely from the fruit both of *Narhex* and *Ferula*, and belongs to another tribe of the Order.

November 17.

E. Forster, Esq., V.P., in the Chair.

Francis James Graham, Esq., B.A., and William White Williams, Esq., M.D., were elected Fellows; and Mr. William Hanson was elected an Associate.

Read a portion of Dr. William Buchanan Hamilton's "Commentary on the Hortus Malabaricus of Van Rheede."

December 1.

E. Forster, Esq., V.P., in the Chair.

George Busk, Esq., David Barclay Chapman, Esq., William Robert Fisher, Esq., and Adam White, Esq., were elected Fellows.

Read a paper "On the Structure and Movements of *Bacillaria*

paradoxa, Gmelin." By G. H. K. Thwaites, Esq. Communicated by William Spence, Esq., F.R.S., F.L.S. &c.

Mr. Thwaites commences his memoir by a description of the species. The filaments are ribbon-shaped, curved, pale brown with a paler mesial line, and consist each of from 4 or 5 to upwards of 100 linear frustules, lying contiguous and parallel to each other. The front view of each frustule exhibits a slight tapering towards the apices, and a minute dentation on the inner edge of the smooth raised lateral margins, the intermediate space being smooth. In a side view, the surface of mutual contact is seen to be linear-lanceolate with the apices rounded; and the space between the smooth raised lateral margins is marked with transverse raised striæ. The length of the frustule, and consequently the width of the filament, varies from $\frac{1}{400}$ to $\frac{1}{140}$ of an inch; and the width of the frustule from $\frac{1}{10000}$ to $\frac{1}{5000}$ of an inch. The frustules are filled (with the exception of a lighter transverse central fascia) with a pale brown endochrome; and the filaments increase in length from multiplication of the frustules by fissiparous division.

Mr. Thwaites has found this (the original) species of *Bacillaria* abundantly in ditches at the mouth of the Avon near Bristol, in water probably slightly blackish, and also in small quantity in the river Frome at Stapleton, encrusting various aquatic plants with a dark brown coating, which under the microscope is resolved into a number of pale brown filaments that seem to adhere tolerably firmly to the plant on which they are situated. When they have been for a few moments detached, a remarkable motion is seen to commence in them. The first indication of this consists in a slight movement of a terminal frustule, which begins to slide lengthwise over its contiguous frustule, the second acts simultaneously in a similar manner with regard to the third, and so on throughout the whole filament; the same action having been going on at the same time at both ends of the filament, but in opposite directions. The central frustule thus appears to remain stationary or nearly so; while each of the others has moved with a rapidity increasing with its distance from the centre, its own rate of movement having been increased by the addition of that of the independent movement of each frustule between it and the central one. This lateral elongation of the filament continues until the point of contact between the contiguous frustules is reduced to a very small portion of their length, when the filament is again contracted by the frustules sliding back again as it were over each other; and this changed direction of movement proceeding, the filament is again drawn out until the frustules are again only slightly

in contact. The direction of the movement is then again reversed, and continues to alternate in opposite directions, the time occupied in passing from the elongation in one direction to the opposite being generally about 45 seconds. In the course of this movement the filaments seldom resume their original *Fragilaria*-like appearance; and there are occasional interruptions to its regularity, both the terminal frustules in some cases moving in one and the same direction instead of in a direction opposite to each other. This Mr. Thwaites regards as resulting from a breach in the vital or dynamical connexion of the filament, and as not improbably indicating the place where spontaneous division of the filament is about to occur. If a filament, while in motion, be forcibly divided, the uninjured frustules of each portion continue to move as before, proving (as the author believes) that the filament is a compound structure, notwithstanding that its frustules move in unison. When the filament is elongated to its utmost extent, it is still extremely rigid and requires some comparatively considerable force to bend it, the whole filament moving out of the way of any obstacle rather than bending or separating at the joints. A higher temperature increases the rapidity of the movement.

The author hazards a conjecture that the action of cilia is the proximate cause of the phænomenon; for, although he has been unable to discover cilia, he has little doubt of their presence from the mode in which minute particles of indigo suspended in the water were acted upon, when coming into contact with the frustules. He regards the movement of each individual frustule, considered alone, as closely resembling that which is seen in the detached frustules of other species of *Diatomaceæ*; namely, a so to speak alternate backward and forward movement at regular intervals. On the animal or vegetable nature of the production he has no remarks to offer.

The paper was accompanied by magnified drawings of *Bacillaria paradoxa* in various stages of elongation and retraction; and by very highly magnified representations of its mode of fissiparous increase, and of the markings on both its surfaces.

Read also the commencement of a memoir "On the Vegetation of the Galapagos Archipelago, as compared with that of some other Tropical Islands and of the Continent of America." By Joseph Dalton Hooker, Esq., M.D., F.L.S. &c.

December 15.

E. Forster, Esq., V.P., in the Chair.

Lovell Reeve, Esq., was elected a Fellow.

Specimens of *Juncus diffusus*, Hoppe, collected by John Ansell, Esq., at Darman's Green near Hoddesdon, Herts, were exhibited and presented.

Read the conclusion of Dr. Hooker's memoir "On the Vegetation of the Galapagos Archipelago, as compared with that of some other Tropical Islands and of the Continent of America."

The present paper offers the deductions which Dr. Hooker has drawn with reference to Botanical Geography from his "Enumeration of the Plants of the Galapagos Islands," read during the previous session. He regards the relationship of the Flora to that of the adjacent continent as double; the peculiar or new species being for the most part allied to plants of the cooler parts of America or of the uplands of the tropical latitudes, while the non-peculiar are the same as abound chiefly in the hotter and more humid regions, such as the Islands of the West Indies and the shores of the Gulf of Mexico; and while on the other hand many of the species, and those the most remarkable (as is likewise the case with regard to the Fauna), are confined to a single islet of the group, and often represented in other islets by similar, but specifically very distinct, congeners.

The author commences his memoir with an account of the geographical position, and of some of the most important features of the climate and soil of the Archipelago, chiefly derived from the journals of Mr. Darwin and of some other voyagers, including the unpublished journal of the late Mr. T. Edmonstone. This is followed by an Enumeration of the Naturalists who have explored it in the order of the dates of their respective visits, including Mr. Cuming, Mr. David Douglas, Dr. Scouler, Mr. Macrae, Mr. Darwin, Admiral Du-Petit-Thouars and Mr. Edmonstone. The total number of species brought together from these various sources amounts to 244, of which 202 are flowering plants and 28 ferns. All of these, excepting perhaps 17, natives of Charles Island (the only inhabited one), are truly indigenous, but it is probable that this is only an approximation to the true

number. Under any circumstances, however, the Flora is extremely poor when compared with that of other tropical islands of equal, or even of smaller, extent; the Cape de Verd Islands, scarcely so well explored, yielding upwards of 300 species on a soil quite as sterile; and the Sandwich and Society groups being very much richer, although further detached from any great continent.

Dr. Hooker next proceeds to review the Flora under three distinct heads; first with reference to the proportion borne by each of the principal Natural Orders to the whole Flora, and its relations to the Flora of the neighbouring continent and of other islands somewhat similarly circumstanced. Secondly, he treats of the Flora of the Galapagos as divisible into two types; the West Indian (including Panama), to which the plants common to other countries and some dubious species almost universally belong; and the Mexican and temperate American, or that under which the great majority of the peculiar species rank. Thirdly, he notices the most singular feature in the vegetation of the group, namely that the several islets are tenanted for the most part by different species, many of which are, however, represented by allied species in one or more of the other islets. Under each of these heads Dr. Hooker enters into minute statistical details, accompanied by extensive research and careful comparisons.

Read also a "Description of a new species of *Cowry*." By G. B. Sowerby, Esq., F.L.S. &c. &c.

CYPRÆA VENUSTA, testâ ovato-ventricosâ utrâque extremitate anticâ præcipuè subrostratâ, dorso gibboso carnicolore maculis pallidè castaneis notato, lateribus basalibus incrassatis carnicoloribus, extremitatibus pallidè castaneis roseo-tinctis, basi subplanulatâ albicante extremitatibus carnicoloribus, spirâ validâ obtusâ anfractibus duobus, aperturâ elongatâ angustâ rectiusculâ intùs roscâ posticè in canalem brevem sinistralem exeunte anticè subflexuosâ, canali anticâ brevi rectiusculâ paululùm deflexâ, dentibus labii externi circa 25 magnis interstitiis æqualibus rotundatis; labii interni paucis (circa 16) majoribus distantibus anticis maximis medianis ferè obsoletis, cavitate columellari parvâ albâ.

A very handsome Cowry, of which a single specimen has lately been received from Port Adelaide, South Australia.

January 8, 1847.

The Lord Bishop of Norwich, President, in the Chair.

At a Special General Meeting convened by the Council in the terms of the following circular :—

“ Linnean Society, 32 Soho Square,
December 28th, 1846.

“ SIR,

“ You are requested to attend a Special General Meeting of the Society, on Friday the 8th of January next, at two o'clock in the afternoon *precisely*, to consider the subject of the following Statement and Resolution of Council.

“ The late Edward Rudge, Esq., F.L.S., who died on the 3rd of September last, has in his will made the following bequest :—

‘ I give and bequeath to the President and Council for the time being of the Linnean Society of London, the sum of Two Hundred Pounds, in trust, to invest the same in the names of Trustees, in the purchase of 3 per cent. Consolidated Bank Annuities, and from time to time, as occasion may require, out of the Dividends thereof, to purchase a Gold Medal, to be called ‘ The Linnean Medal,’ to be awarded by the President and Council of the said Society, at their discretion, to the Fellow of the said Society who shall write the best communication in each volume which after my decease shall be published by the said Society, in either of the four departments of Natural History, every such Gold Medal to contain the Profile Bust of Linnæus in his full dress, encircled by his name and the dates of his birth and death on the one side, and the engraved name of the Fellow of the said Society to whom such Medal shall be awarded, encircled by a wreath of the *Linnæa borealis*, on the obverse.’

“ The Council has repeatedly had the subject and terms of this bequest under its serious consideration, and has, after much patient and anxious deliberation, unanimously come to the following resolution :—

‘ Resolved,—That in the opinion of this Council, on a full consideration of the terms of the bequest of the late Edward Rudge, Esq., of the interest of a sum of £200, for the purpose of establishing a Medal ‘ to be awarded by the President and Council of the (Linnean) Society, at their discretion, to the

Fellow of the said Society who shall write the best communication in each volume which after his (the testator's) decease shall be published by the said Society, in either of the four departments of Natural History,' it is inexpedient to accede to the liberal intentions of the testator under the conditions expressed in his will.'

'That this Resolution be submitted to a Special Meeting of the Society.'

"This Resolution, which has received the entire concurrence of the President and of every Member of the Council, was chiefly founded on the following considerations:—

"The great object of the Linnean Society, as of all other bodies similarly constituted, is the production and publication of such essays as tend to the advancement of that branch of science which it cultivates. The principal question therefore in reference to Mr. Rudge's bequest, is the manner in which its acceptance would operate on the Society's publications, and the Council has arrived at the conclusion that its tendency would be prejudicial rather than favourable; inasmuch as while the Medal would offer no inducement to some of those Members who have hitherto been in the habit of communicating papers which have had a place in the 'Transactions,' they might, on the contrary, be unwilling to submit their future communications to this new ordeal; and it does not appear probable that the Medal would prove a stimulus to the production of more valuable Essays from any other class of the Society. On the other hand, it is probable that dissatisfaction would arise in the minds of some of those Members, who after contributing papers to more than one volume of the 'Transactions,' should fail in obtaining the award of a Medal.

"A second objection to the acceptance of the bequest arises from the absence of any discretionary power of withholding the Medal, which is necessarily to be awarded to the best paper in every volume, and consequently to papers of very unequal value, thereby lowering the character of the Medal, and consequently affecting the scientific reputation of the Society itself.

"Differences of opinion, and consequent dissatisfaction, would also be not unlikely occasionally to arise in deciding upon the comparative merits of papers in botany and zoology, the two branches of natural history, of which, for many years past, the Transactions of the Society have exclusively consisted.

"Another point may still be noticed as decidedly unfavourable to the acceptance of the bequest, namely, the not improbable award of the Medal by the Council, in some cases to one of its own body, in

strict conformity with the conditions of the will; conditions which neither the Council itself, nor (as it appears from the tenor and provisions of the will) any other party has the power to modify.

“These objections have appeared to the Council so important as not to admit of any other course but that of respectfully declining to accept a bequest, the operation of which would in all probability be injurious to the best interests of the Society, by lowering the character of its publications, and endangering the continuance of that harmony which has hitherto prevailed in all essential points. The Council is at the same time deeply sensible of the kind and liberal intentions of Mr. Rudge, and entertains a sincere regret that the express terms of his will should have rendered the acceptance of his bequest liable to such grave objections.

“I have the honour to be, Sir,

“Your most obedient humble servant,

“JOHN J. BENNETT, *Secretary.*”

It was moved, seconded and carried unanimously, that the Society concur in the Resolution of Council, and that the thanks of the Society be given to the Council for the mode in which they have submitted the question to the consideration of the Society.

January 19.

E. Forster, Esq., V.P., in the Chair.

Mr. William Mitton was elected an Associate.

Mr. Ward, F.L.S., exhibited a fine series of specimens of *Adiantum Capillus Veneris*, L., together with a specimen of *Asplenium Trichomanes*, L., collected in Italy by Mr. E. W. Cooke, the latter bearing on several of its pinnæ sori taking their origin from the upper as well as from the lower surface of the frond; and also a portion of a large branch of a Scotch Fir hollowed out by hornets to form a nest, and beautifully exhibiting in the dissected parts the origins of the smaller branches.

Read a paper “On the Natural History, Anatomy, and Development of *Meloë* (second memoir).” By George Newport, Esq., F.R.S. &c. Communicated by the Secretary.

Mr. Newport states at the commencement of his paper, that his

present object is to compare the habits and anatomy of *Meloë* in its larva state with those of the larvæ of allied genera, and with the parasitic groups of insects the *Strepsiptera* and *Anoplura*, with a view to show that habit and instinct in animals are always closely associated with the functions of particular organs, and seem to be the immediate result of structural peculiarities of organization.

Having in his former memoir described the habits of *Meloë*, and traced the young from the egg to the imago state, he now entered on an examination of the habits of the entire group of insects allied to *Meloë*, and showed that the whole of them in their larva state bear a general resemblance to the larva *Meloë*, not only in their organization but also in their habits; and that the more closely the larvæ of different genera approach in structure, the more nearly also are they allied in instinct and œconomy. This accordance between structure and instinct he regards as universal throughout nature, and as particularly marked in the *Articulata*. The author believes that, by carefully comparing our observations on the natural history of animals with their peculiarities of structure, and these on the other hand with their instincts, what might otherwise remain useless and isolated facts may be rendered truly important to science, "as data on which a correct knowledge of the laws of creation and life may be established." In this way, he states, "natural history may be made to occupy its proper position as an important branch of useful knowledge, and mainly help to demonstrate the connexion which subsists between structure and function, and function and the habits of animals."

In pursuing this view, he shows that the organization and instinct of the larva *Meloë* closely agree. At the moment of birth, when the larva is destined to attach itself parasitically to the *Hymenoptera* which alight on flowers to collect pollen, and which are to convey it to their nests, its organs of vision are largely developed, and those of locomotion are elongated, powerful, and constructed like those of the parasitic *Anoplura*; and it is extremely active and sensitive of light. But when, at the period of full growth, it is found in the cell of *Anthophora*, it is a fattened, yellow-coloured, almost motionless larva, with its legs atrophied and reduced to mere pedal tubercles previous to a further change in their structure when the larva passes to the state of nymph.

In the course of these observations Mr. Newport proved, by actual comparison, the identity of many yellow-coloured larvæ which had been taken by Mr. Smith on some of the *Nomadæ* (themselves parasitic insects) with the larvæ of *Meloë*, which he had himself

reared from the eggs, thus establishing the fact of the parasitic attachment of *Meloë* to perfect *Hymenoptera*. The genera allied to *Meloë* (*Mylabris*, *Lytta*, *Tetraonyx*, *Sitaris* and *Apalus*), and those of allied families, *Horia*, *Cipiter*, *Rhipiphorus*, *Symbius* and others, were all shown to bear a more or less close relation to *Meloë* in the habits or the structure of their larvæ. *Sitaris* was especially referred to, on the observations of Audouin and Pecchioli, as affording close similarity to *Meloë* both in structure and habit, this species having already been found by the former naturalist in the nests of *Anthophora*.

Mr. Newport then traced the history of the *Strepsiptera* as now ascertained by the labours of Siebold, most of whose observations he has confirmed, and he showed some remarkable coincidences between the structure and habits of the extremely minute larvæ of these insects and those of *Meloë*. The chief of these are their parasitism on the *Hymenoptera*, and the atrophy of their limbs after they are located in the nests of their victims. So extremely minute are the young *Stylops* shortly after their birth, that on measuring several, while living, on a micrometer plate, Mr. Newport found that each individual does not exceed twenty-two thousandths of an inch in length: yet internally this minute object is as fully organized as other insects. He then showed that what had been regarded by Dr. Siebold as a cæcal termination to the alimentary canal is in fact a reduplication of part of that organ, which after folding twice on itself is continued to the anal segment as in other insects. He also described the imago of this species of *Stylops*, which, as well as its larvæ, had been obtained from the bee, *Andrena Trimmerana*, and pointing out in what it seems to differ from *Stylops melittæ*, he proposed to describe it as *Stylops aterrimus*.

Comparing the male *Stylops* with the female, Mr. Newport remarked especially on the peculiar organization of the former, as fitted for special instincts, perfection of vision and celerity of flight, conjecturing that the object of this in *Stylops* may be the detection on the wing of those *Hymenoptera* which carry about with them through the air the apodal female that awaits impregnation; and showed that all we yet know of the habits of *Stylops* is conformable to this view.

Returning then to the consideration of *Meloë*, the author showed that notwithstanding the structures with which it left the egg are fully developed, they are so on an inferior type of organization, like *Stylops* and like the *Anoplura*. The eye, although large and highly sensitive to light, is still but a single ocellus, fitted only for near vi-

sion. The limbs although strong are unguiculated, like those of the *Anoplura*, and fitted for clinging rather than for regular progression; and its mandibles, retaining the jointed, pediform structure of the corresponding organs in the carnivorous *Chilopoda*, are fitted for piercing soft structures, rather than for triturating or for incising their food. This fact, overlooked by the author in his former memoir, now induced him to believe that the young *Meloë* pierces and preys on the bee larva rather than that it subsists on its food. This he believes also may hereafter prove to be the true habit of the larva of most of the allied genera.

Specimens of the larva and imago *Stylops*, and of the larva, nymph and imago *Meloë*, were on the table for inspection.

February 2.

E. Forster, Esq., V.P., in the Chair.

George Stacy Gibson, Esq., was elected a Fellow.

Read an "Account of *Gamoplexis*, an undescribed genus of Orchideous Plants." By Hugh Falconer, M.D., F.R.S., F.L.S. &c. &c.

Trib. GASTRODIEÆ, R. Br.

Gen. GAMOPLEXIS, Falc.

Perianthium monophyllum, tubulosum, basi ventricosum; limbi breviter 6-lobi segmenta rotundata, antrorsum (torsione) subsecunda, exteriora æqualia, interiorum posticum (labellum) pedicelli torsione anticum lateralibus paulò majus, cæteris consimile. *Columna* elongata, erecta, semiteres, marginato-dilatata, apice tridentata cava, basi anticè incrassata stigmatifera. *Anthera* terminalis, mobilis, decidua, carnosa, bilocularis; loculis parallelis contiguis. *Massæ pollinis* in quovis loculo solitariæ, e lobulis majusculis granulatis laxè cohærentibus conflatæ. *Glandula* aut *caudicula* nulla.—Herba *parasitica* (?) *aphylla*, *vaginata*, *rufescens*, *habitu* Orobanchen *quamdam omninò referens*. *Rhizoma* hypogæum, tuberosum, annulatum, spongiosum. *Racemus* elongatus, multiflorus, primò nutans, demùm erectus. *Flores* mediocres, erecti, pallidè stramineo-virides vel ochroleuci.

GAMOPLEXIS OROBANCHOIDES, Falc. MSS. cit. in Royle, *Illustr.* p. 364, et in Lindl. *Gen. & Spec. Orchid. Pl.* p. 384, *absque caractere aut definitione*.

Hab. in umbrosis humidis inter Montes Emოდenses ad alt. circiter ped. 7000; Dhunouitee, Tyne-Teeba, Simla, &c. Floret Julio et Augusto.

After a detailed description of the plant, Dr. Falconer proceeds to

point out its affinity both in habit and structure to *Gastrodia*, R. Br., and to *Epiphanes Javanica*, Bl., from both which, however, it is sufficiently distinct in the cohesion of the labellar segment with the tube of the perianthium. It is the only example, so far as Dr. Falconer is aware, hitherto ascertained in the order, of the union of all the divisions of both whorls of the floral envelope into a monophyllous perianthium. Its parasitism is of a peculiar kind; the tuberous rhizoma emits no root-fibres by which to attach itself to other plants, but is itself matted over by their slender rootlets which ramify upon it in every direction slightly imbedded in its surface, to which they adhere with great tenacity, and especially to the scarious margins of the abortive sheath annuli. This peculiarity was observed in numerous instances, but other cases occurred in which the surface of the tubers presented no such appearance.

February 16.

The Lord Bishop of Norwich, President, in the Chair.

William Baird, Esq., M.D., and George Newport, Esq., were elected Fellows.

Read an extract from a letter addressed by Captain Sir E. Home, Bart., R.N., to R. Brown, Esq., V.P.L.S., giving an account of the measurement of some of the largest of the New Zealand and Norfolk Island Pines. With reference to the former Sir E. Home quotes from the Journal of Mr. Saddler, Master R.N., who was sent to New Zealand in 1833-4 in command of the Buffalo Store-ship to procure spars for the Navy. The tree which he describes was in a forest near Wangaroa, some miles north of the Bay of Islands. Mr. Saddler says, "On 16th (May 1834) I went to examine a Kauri tree [*Dammara australis*, Lamb.] which Mr. Betts the purveyor in his search through the forest had discovered a few days previous; it is situated about two miles from the river on the steep bank of a ravine. It appeared perfectly sound and healthy, and measured forty-three feet nine inches in circumference, and sixty feet high without a branch. Its head then spread out into forty-one principal branches, some of which were four feet through. It is more than double the size of any tree I have before seen in this country." Sir E. Home adds,

No. XXXII.—PROCEEDINGS OF THE LINNEAN SOCIETY.

that the largest tree of this species that he saw was only eighteen feet eight inches in circumference ; but that in Norfolk Island he had measured the largest tree [of *Araucaria excelsa*, Sol.] known to be upon the island and had found it to be 187 feet high, the girth at four feet from the ground fifty-four feet, and at twenty feet from the ground fifty-one feet. This tree is hollow for sixteen feet above the ground, but is in good health.

Read also a memoir "On the Structure and Comparative Physiology of *Chiton* and *Chitonellus*." By Lovell Reeve, Esq., F.L.S. &c. &c.

Mr. Reeve commences his paper by remarking on the paucity of species of *Chitonidæ* known to Lamarck so lately as 1819, and the very large number (amounting to between two and three hundred) now known to inhabit the western coast of South America, the shores of New Holland and New Zealand, and other localities explored by recent voyagers ; and states that he is enabled by the kindness of Mr. Cuming and Capt. Sir Edward Belcher to offer a few observations on the structure of *Chiton* and such remarks on *Chitonellus* as, in his opinion, will leave no doubt of their claim to generic distinction. He notices the successive additions made to these genera by Mr. Fremby, by Mr. Cuming, by M. Quoy, by Capt. Belcher in the voyages of the Blossom, the Sulphur and the Samarang (and especially in the latter in company with Mr. Arthur Adams), by the Rev. Mr. Hennah, by Dr. Dieffenbach, by Mr. Earl, by Mr. Ronald Gunn, by Mr. Ince, by Dr. Gould, by Mr. Courthony, and by Prof. Edward Forbes and Mr. M'Andrew ; and then enters into an examination of the views of authors with reference to their affinity, adopting that first promulgated by Adanson and now generally adopted, that they are immediately related to *Patella*. A description of the animal is then given, and the differences between it and the animal of *Patella* pointed out, as well as the modifications to which it is subject in different species. The distinctions between the shells and animals of *Chiton* and *Chitonellus* are more particularly insisted on ; and the author proceeds to point out a marked difference in the habits of the two genera. He states, on the authority of Mr. Cuming, that while the *Chitons* live attached to stones and fragments of shells in deep water, or more frequently under masses of stone and on exposed rocks about low-water mark, the *Chitonelli* dwell in holes and cavities, either of natural formation or bored by other *Mollusca*, into which they thrust themselves by attenuating their bodies in a surprising manner, sometimes turning completely at right angles and at

angles again. Those which were only partially imbedded were found to have entered holes too small to contain them, and the posterior part of their bodies remained suspended externally, fat and swollen, and constantly separating from the anterior half when any attempt was made to draw them forcibly from their retreats. These remarks apply to *Chitonellus fasciatus*, collected by Mr. Cuming in the Philippine Islands in great abundance and of extraordinary dimensions, extending frequently to a foot or more in length. Capt. Sir E. Belcher and Mr. Adams collected the same species in the Korean Archipelago, where they were found in company with Chitons and noticed to be of locomotive habits; the *Chitonellus* seeking retirement in a hole or cavity, but crawling away from its attachment on being disturbed, at about the pace of the common garden snail.

For these reasons, although Mr. Reeve does not regard the other subdivisions proposed in the genus *Chiton* as of greater value than sectional, he considers *Chitonellus* as entitled to rank equally with *Chiton* in its most extended form, being in his opinion clearly distinguished both in structure (as regards the condition of the mantle and its system of calcification) and in habit.

March 2.

The Lord Bishop of Norwich, President, in the Chair.

William Thomas Collings, Esq., and Thomas Vernon Wollaston, Esq., were elected Fellows.

Read "Notes on the seals of Linnæus." By the Baron d'Hombres Firmas. Communicated by the Secretary.

In these notes, intended to form part of the preliminary matter prefixed to the correspondence of Linnæus with his uncle, Boissier de Sauvages, which the Baron is about to print for private distribution, an account is given of the seals employed by Linnæus in that correspondence, and of some others with which M. d'Hombres Firmas has become acquainted from other sources. Of all of these he gives figures, adding the armorial bearings of Linnæus as designed by himself, and as altered to suit the rules of heraldry by the Chancellor De Fitas, the seal of the Linnean Society, and the reverse of a medal

struck in 1758, in honour of Linnæus, by order of Count Tessin, Marshal of the Diet.

Read also a paper "On the Impregnation of *Dischidia*." By the late William Griffith, Esq., F.L.S. &c. &c. Communicated by Robert Brown, Esq., V.P.L.S.

In this paper, dated "Mergui, March 7, 1835," Mr. Griffith details a series of observations made in January of that year on *Dischidia Rafflesiana*, Wall., and confirmed (with the exception of those relating to the development of the ovule) by the examination of another species, apparently allied to *D. Bengalensis*, Colebr.

Mr. Griffith commences by a description of the progress of the ovula from their first appearance as mere rounded elevations on the placenta. The first change consists in a narrowing towards the base, which afterwards puts on the appearance of a funiculus, and at the same time a rounded rather shallow cavity appears on the upper edge of the ovulum close to the funiculus. The further changes take place rapidly; the rounded cavity assumes the appearance of a deep fissure with raised margins extending from the base of the ovulum, close to the funiculus, along the upper margin of the ovulum for about one-fourth of its length. This fissure gradually lengthens; its lips become more expanded, and a small indistinct grumous-looking mass becomes visible in the central line and towards the apex of the ovulum, which is the first rudiment of the nucleus, or of the cavity within which the future embryo is to be developed, and which becomes subsequently more distinct, and frequently assumes a rounded form. In the perfect ovule the fissure is very large, extending longitudinally from the base of the funiculus for about one-third of the length of the convex upper margin of the ovule; its lips are gaping, and it is of considerable depth, gradually narrowing towards its fundus. The grumous mass is now very distinct and the first indications of an excavation around it are appreciable. When no impregnation has taken place, in flowers that have passed their meridian, the excavation is enlarged, the grumous mass is more irregular, and it frequently appears to be broken up, the component parts being irregularly grouped together.

The partial closing of the corolla of *Dischidia* by the connivence of its divisions, and the short hairs with which those divisions are furnished internally in *D. Rafflesiana*, induced Mr. Griffith to regard foreign agency as inapplicable in determining the escape of the pollen from their anthers, and to believe that impregnation in any given flower is in this genus the result of the action of its own pol-

linia. The pollinia are erect, have no diaphanous margin, and dehisce along that margin which is internal with regard to the cell of the anther, and which presents no appreciable difference of structure, but corresponds with the margin of dehiscence of the pendulous pollinia first noticed by Mr. Brown. The base of the stigma is slightly papillose in *D. Rafflesiana*, and more evidently so in the other species; and the fissures of communication are open in the former, but closely approximated in the latter. In neither has Mr. Griffith seen the pollinia engaged in these fissures, but they are either caught by the processes of the corona or fall to the fundus of the corolla; and in whatever situation they emit their boyaux, the cord formed by the aggregation of the latter always engages itself in the nearest fissure where it becomes more opaque and grumous. The cord then passes upwards to the base of the stigma, along which it is reflected until it reaches the union of the stigma with the styles, at which place it dips into one of them, or rarely both, and proceeds downwards to the placenta, causing a slight discoloration of the adjoining tissue. The boyaux then separate and proceed in every direction among the ovula, to which they become firmly attached. They contain much granular matter which has a strong tendency to accumulate towards their termination. Mr. Griffith states that he has observed an oscillatory motion, but no motion of ascent or descent, of the contained granules. The tubes are simple and one appears to be allotted to each ovulum, to which it remains applied for some time, invariably passing in at the centre of the fissure and adhering so firmly that they break across rather than separate. Mr. Griffith was unable to demonstrate their termination internally by actual dissection, but in one instance he observed the boyau to terminate about the fundus of the fissure in a cul-de-sac, which was crowded with granules. Whatever the function of these granules may be, similar bodies exist in the cellular tissue of the ovula both before and after the application of the tubes, and the majority certainly disappear before the tubes reach the ovula.

No immediate change appears to be produced in the ovula by the application of the tubes; but some time afterwards the excavation appears to enlarge and extend towards the point of insertion of the tube; and this action is continued until the whole of the granular mass disappears and the chief part of the ovulum is occupied by the now empty excavation. No further appreciable change, except in size, takes place for some time, and the rudiments of the coma are even visible before any part of the embryo appears to be formed.

March 16.

The Lord Bishop of Norwich, President, in the Chair.

Benjamin Waterhouse Hawkins, Esq., was elected a Fellow.

Mr. Ward, F.L.S., exhibited specimens of several Ferns collected in Ireland, including *Trichomanes speciosum* (referred to *Tr. radicans*, Hedw. fil.) found in a new station on the Toomies mountain, Killarney; *Hymenophyllum Tunbridgense*, of more than double the size of any specimens to be found at Tunbridge Wells; and a monstrous and singularly divided variety of *Asplenium Filix Fœmina*, found about twenty years ago in Connemara, and sent to the Botanic Garden at Dublin, where it maintains its character when grown from the sporules, which are freely produced.

Read a "Note on *Samara læta*, L." By G. A. Walker Arnott, Esq., LL.D., F.L.S., Regius Professor of Botany in the University of Glasgow.

In this note Dr. Arnott gives a minute account of the history of the genus *Samara*, and of the errors of various authors in regard to it, originating partly in Linnaeus's own misquotation as a synonym of *Burm. Thes. Zeyl. t. 31*, which represents a species of *Memecylon*; partly in Jussieu's reference of the genus to *Rhamnea*, afterwards corrected by himself, but which correction seems to have escaped observation; and partly in the assumption that the *Samara læta* of Swartz, referred to in his 'Flora Indiæ Occidentalis,' must therefore be a plant of the West Indies. With regard to the affinities of the genus, he notices Mr. Brown's reference to *Myrsine* of the three species added by Swartz, Solander and Willdenow, and also Jussieu's suggestion that *Samara* is related to *Myrsine*, both published in 1810. A detailed examination of the three specimens of *Samara læta* preserved in the Linnean Herbarium, and of three specimens from China referred to that species in the Banksian Herbarium, follows; and he concludes from this examination that *Samara*, L., is identical with *Choripetalum*, A. DeC., which is scarcely distinguishable from *Embelia*, L., except in the quaternary instead of quinary division of the flower, although perhaps the æstivation may also slightly differ. The following are the characters which Dr. Arnott gives of the species hitherto known to him :—

1. *S. læta*, floribus corymbosis, bracteis pedicello duplò brevioribus, petalis intùs glabris, foliis membranaceis planis.

Saimara læta, *L., Sw. &c.*

Hab. in Chinâ.

2. *S. undulata*, floribus racemosis, bracteis pedicello multò brevioribus, petalis intùs glabris, foliis membranaceis undulatis.

Myrsine? undulata, *Wall. in Roxb. Fl. Ind. i. p. 299.*

Choripetalum undulatum, *Alph. DeC. in Linn. Trans. xvii. p. 131.*

Hab. in Nepaliâ.

3. *S. viridiflora*, floribus racemosis, bracteis pedicello duplò brevioribus, petalis subacutis intùs subvelutinis, foliis subcoriaceis.

Choripetalum viridiflorum, *Alph. DeC. Prodr. viii. p. 88.*

Hab. in Javâ.

4. *S. aurantiaca*, floribus spicato-racemosis, bracteis pedicellum ferè superantibus, petalis intùs velutinis, foliis coriaceis.

Myrsine? aurantiaca, *Wall. in Roxb. Fl. Ind. i. p. 300.*

Choripetalum aurantiacum, *Alph. DeC. in Linn. Trans. xvii. p. 131.*

Hab. in Peninsulâ Indiæ Orientalis, ad Quilon.

5. *S. atropunctata*, floribus racemosis, bracteolis pedicello florigero duplò longioribus, petalis obtusis intùs glabris, foliis coriaceis.

Hab. in Peninsulâ Indiæ Orientalis, ad Quilon.

Of the stability of this latter species, however, although apparently distinct from *S. aurantiaca* in the characters given, Dr. Arnott entertains some doubts.

April 6.

R. Brown, Esq., V.P., in the Chair.

Robert M'Andrew, Esq., and James Forbes Young, Esq., M.D., were elected Fellows.

Read a "Note on *Cryptophagus cellaris*, Payk." By George Newport, Esq., F.R.S., F.L.S. &c.

The author states that in his first memoir on *Meloë* he described a larva, of which he had found three specimens in the cell of *Anthophora retusa*, and which, although they were of small size, he then thought might ultimately prove to be the young of *Meloë*, at a period of growth between that in which it is now known to come from

the egg, and that in which he has found it, immediately before it changes to a nymph. He did not however describe them as actually the young of *Meloidæ*, and he now finds that they belong to another family, the *Engiida*.

The author then describes these larvæ more minutely, and states that having kept them in a glass vessel partly filled with dry clay and a cell of *Anabaptista crassa* which contained a nymph, he found that the larvæ constantly sheltered themselves beneath it, although they did not attempt to prey on it, but fed on the rejectamenta trodden before it underwent its change. The larvæ continued in this state till the beginning of January, when each specimen quitted the cell of the bee, and excavated for itself a burrow in the clay in which it assumed the nymph state. The nymph closely resembled that of *Diaperis Bokeni* in its general appearance.

At the end of February each specimen assumed the imago state, but continued feeble, and remained in its burrow until the eighth of March when it came forth and proved to be *Cryptophagus cellaris*.
Peyk

April 20.

E. Forster, Esq., V.P., in the Chair.

David Thomas Ansted, Esq., M.A., was elected a Fellow.

Read a paper "On a new genus of Plants of the family *Burmanniaceæ*." By John Miers, Esq., F.R.S., F.L.S. &c. &c.

ORCHIDACEÆ.

Pterostichium superum, tuberosum, gibbosum, caducum: fere laterali
 alaribus sessilibus: limbo 6-partito, laciniis 3 exterioribus brevibus
 ovatis, 3 interioribus longissimis subulatis. *Stamina* 6, libera, infra
 perianthii lobum inserta et ejus laciniis opposita, inclinata, raris tubum
 recedente. Filamentis pedicellatis, margine appendiculatis: antheris ad-
 natis in sine filamentorum terminations, 3-jovularibus. loculis longita-
 dinaliter dehiscentibus. *Ovarium* inferum, 1-jovulare: placentis 3 pa-
 reticellatis, medio ovuliferis: ovulis indefinitis, anatrophis. *Stylus* brevis.
Stigma 3. *Fructus* tuberosus, truncatus, apice operculatum dehiscens,
 1-jovularis. *Semina* plurima, scrobiculata. *Embryo* ignotus.—Planta
 Esculenta. *hyalina, sapor liquoris carminum parvitiæ*; rhizomate
 tuberoso, fibrillis nervosis; carne simplici, creta, subferroso, angu-

lato, ferè apophyllo; limbo solitario, terminali, 2—4-bracteato; bracteam brevibus vel sub flore vel in caule medio, erectis; perianthii tubo subhyalino, laciniis interioribus rotatis, exterioribus spatia, coronam luteam margine aurantiaco; fructu hyalino.

1. *O. MACABENSIS*, caule nudo, bracteis 2 r. 3 florem solitarium terminalem suffulcentibus.

Hab. ad Macabè, in Prov. Rio de Janeiro.

Planta 2—3-pollicaris.

2. *O. IGUASSUENSIS*, caule subnudo medio bracteis 3 r. 4 in verticillum dispositis instructo.

Hab. ad Iguaçu, in Prov. Rio de Janeiro.

Planta vix pollicaris.

Mr. Miers compares this Brazilian genus with *Thiemia*, Griff. (characterized at p. 221), of which he has seen specimens in the herbarium of Sir William Hooker, as well as a specimen probably of the same species collected by Capt. Champion in the island of Ceylon. He regards *Thiemia* and *Ophiomeris* as constituting a distinct section of the family *Burmanniaceae*, which he proposes to subdivide as follows:—

BURMANNIACEÆ.

- I. BURMANSIÆ. *Perianthium* tripartitum. *Stamina* 3. *Ovarium* 3-loculare. *Placenta* centralis.

Capsula longitudinaliter dehiscens 1. *Burmannia* L.
 ——— transverse fessura 2. *Geoponanthus* Burm.

- II. APTELLÆ. *Perianthium* simplex. *Stamina* 3. *Ovarium* 1-loculare. *Placenta* 3, parietales.

Capsula irregulariter 3-valvis 3. *Dactyloctenium* Miers.
 ——— lateraliter bifida 4. *Cymbulocarpus* Miers.
 ——— apice 3-valvis. *Stamina* apertè }
 circulate } 5. *Agave*, Nutt.
 ——— irregulariter dehiscens. *Petalis* }
 nullis } 6. *Gymnanthemum* Burm.

- III. THISEIÆ. *Perianthium* simplex. *Stamina* 3. *Ovarium* 1-loculare. *Placenta* 3, parietales. *Pericarpium* circumscissum.

Ocellis tubis æqualis. *Stamina* insertè }
 delphæ } 7. *Thiemia*, Griff.
 ——— gibbosa. *Stamina* libera 8. *Ophiomeris*, Miers.

The paper concludes with some observations on the affinities of these plants, and of *Triuris*, Miers, and *Peltanophyllum*, Gardn.; and was illustrated with detailed drawings of *Ophiomeris Macabensis*, and of the flower of *Thiemia Burmannia*, Griff., for comparison.

May 4.

E. Forster, Esq., V.P., in the Chair.

Henry Cadogan Rothery, Esq., M.A., was elected a Fellow.

Read a paper "On *Jansonia*, a new genus of *Leguminosæ*, from Western Australia." By Richard Kippist, Libr. L.S.

JANSONIA.

CHAR. GEN. *Calyx* ebracteatus, bilabiatus; labio superiore ferè ad basin bifido; inferiore 4-plò longiore, 3-partito; segmentis omnibus acutis. *Corollæ papilionaceæ petala* longè stipitata; *vexillum* ovato-lanceolatum, reflexum, *alis* oblongo-ellipticis multò brevius; *carinæ* compressæ (alis tertiâ parte longioris) petala oblonga, basi auriculata, dorso connata. *Stamina* 10, libera, vel imâ basi cohærentia, inæquilingua, persistentia. *Ovarium* villosissimum, substipitatum, stipitulo basi vaginulâ cincto, pauci- (4—6) ovulatum, suturis non inflexis. *Stylus* filiformis, elongatus, apice incurvus, glaber. *Stigma* parvum. *Legumen*—Suffrutex Novæ Hollandiæ Austro-Occidentalis, Brachysemati, R. Br. *proximus*; ramis *erectis vel adscendentibus*; foliis *oppositis, oblongo-ovatis, emarginatis, mucronatis, utrinque reticulatis, margine revolutis, subundulatis, minutè denticulatis*; stipulis *lanceolato-subulatis, demùm deciduis*; floribus *sessilibus, congestis in capitula cernua, 4-flora, bracteis 4 ovatis decussatis, coriaceis, fuscis, extùs sericeis suffulta, ramulos breves axillares terminantia.*

JANSONIA FORMOSA.

Hab. in Novæ Hollandiæ Orâ Austro-Occidentali, ad "Scott's River" (1842), *Gilbert (v. s.)*.

Obs. Specimen habitu debiliore, et foliis ramulisque pubescentibus paulò diversum a *D. Jac. Drummond* ad "Swan River" lectum (*v. s. in Herb. D. Lemann*).

The nearest affinity of *Jansonia* is with *Brachysema*, R. Br., with which genus Mr. Kippist states that it agrees in its unguiculate petals, in the form and unusual length of the keel, in the extreme shortness of the standard, in its elongated filiform style, and in its shortly stalked villous germen, surrounded at the base by a minute fleshy ring; but it is abundantly distinguished by its capitate inflorescence, by the remarkable inequality of its calycine segments, by the much greater length of the claws of its petals, and by the paucity of its ovules, which do not appear to exceed six in number. Mr. Kippist also compares it with *Leptosema*, Benth., which is clearly distinguished by its bibracteolate calyx, composed of two nearly equal

lips, the uppermost of which is very slightly bifid ; its scarcely unguiculate vexillum ; its wings about equal in length to the keel ; the distinct inflexion of its *carinal* suture ; as well as by its inflorescence, that of *Leptosema* being a densely crowded raceme, while in *Jansonia* the flowers are perfectly sessile and arranged in a verticillate manner round a common axis, which is slightly prolonged beyond the point from whence the flowers spring in the form of a short mucro.

The genus is dedicated to the memory of the late Joseph Janson, Esq., F.L.S. ; and the paper was accompanied with a drawing of the plant, comprising details of its parts of fructification.

Anniversary Meeting.

May 24.

The Lord Bishop of Norwich, President, in the Chair.

This day, the Anniversary of the birth of Linnæus, and that appointed by the Charter for the election of Council and Officers, the President opened the business of the Meeting, and stated the number of Members whom the Society had lost during the past year, of some of whom the Secretary read the following notices :—

Mr. William Anderson was the son of an humble but respectable man, who was, just previous to the rising of 1745, forester and gardener to a Jacobite Laird in the Western Highlands, and who had some share in favouring the escape of Prince Charles Edward from his pursuers. He afterwards rented a garden at Easter Warriston near Edinburgh, and subsequently removed to Cannon Mills, where his son William, then a sturdy lad, distinguished himself as a leader against the incursions of the more aristocratic youths of the New Town, which were frequently directed upon the village. About 1790 he entered the garden of Messrs. Anderson and Leslie of the Broughton Nurseries ; and after being employed for some time in the neighbourhood of Edinburgh he made his way to London, where he worked for some time in a nursery. About 1798 he became gardener to Mr. James Vere of Kensington Gore, a wealthy silk-merchant, who possessed a large collection of rare and valuable plants. Here Mr. Anderson remained until 1815, and had ample

opportunities of enlarging his knowledge of plants, as well as of studying the best and most improved methods of cultivation. In 1815, on the recommendation of Sir Joseph Banks and Sir James Edward Smith, he was appointed by the Society of Apothecaries to the Curatorship of their Botanic Garden at Chelsea, then vacant by the death of Mr. Fairbairn; and their choice was amply justified by the result. He speedily retrieved the garden from the state of neglect and dilapidation into which it had fallen, and placed it in a thriving and respectable condition, in which he continued to maintain it (as far as the small amount of funds allotted for its support would admit) until his decease. He was elected an Associate of the Linnean Society in 1798, and became a Fellow in 1815, always taking a warm interest in its prosperity, and attending its meetings with the utmost regularity. He died on the 6th of October 1846, at an age approaching 80, having been for nearly thirty-two years Curator of the Botanic Garden at Chelsea, and having borne through life the character of a strictly honourable, upright and independent man, which qualities, he combined with a warm heart and a charitable disposition.

The following are the titles of his communications to the 'Gardener's Magazine' and other horticultural publications:—

"On packing and preserving Seeds (of *Corypha Taliera*)."—Gard. Mag. vol. i. p. 210.

"On Budding the Peach and Nectarine on Almond Stocks."—*Ibid.* vol. i. p. 384.

"On a durable Earthenware Number Tally."—*Ibid.* vol. v. p. 263.

"On Breaking Stones in Gravel Walks."—*Ibid.* vol. v. p. 459.

"On the advantage of building the Furnaces of Greenhouses, &c. within the house."—*Ibid.* vol. xi. p. 247.

"On protecting the Crocus, when in blossom, from Sparrows."—*Ibid.* vol. xiii. p. 172.

"A mode of destroying the White Bug in Hot-houses."—*Ibid.* vol. xvi. p. 110.

"On the Hautboy Strawberry."—*Ibid.* vol. xvii. p. 266.

"On the introduction and cultivation of a variety of *Azalea indica*."—Hort. Trans. vol. ii. p. 259.

Extract of a letter from Mr. Anderson to M. Otto, Director of the Berlin Botanic Garden, containing observations on some weeping varieties of the Hawthorn, Elm, Ash, &c., and on their reproduction by seed.—Verhandlungen des Vereins zur Beförderung des Gartenbaues, &c., Berlin, vol. v. p. 280.

Thomas Bevan, Esq., M.D.

John Bostock, M.D., was the son of a physician in Liverpool, in which town he was born in the year 1774. He lost his father in early infancy, and received his rudimentary education at the New College at Hackney, where the Lectures of Dr. Priestley contributed to imbue his mind with an ardent love of science, which determined him to embrace his father's profession. With this view he completed his studies at the University of Edinburgh, where he took his degree in 1798; and he soon afterwards entered into practice as a physician in Liverpool and continued to reside there for nearly twenty years. During this period, notwithstanding that he was actively engaged in his professional pursuits, he distinguished himself by numerous contributions to various Medical and Scientific Journals and to Brewster's 'Encyclopædia,' as well as by the prominent part which he took in the establishment and support of the scientific and charitable institutions of the town. Among these the Fever Hospital and the Botanic Garden were greatly indebted to his exertions; and he delivered, as Professor of Physiology, the first course of Lectures given in the Philosophical and Literary Institution.

In 1817, Dr. Bostock quitted the practice of his profession, and fixed himself in London, where he soon became an active member of most of the leading Scientific and Medical Societies. His election into the Royal Society took place in 1818, and in 1832 he was one of its Vice-Presidents. In 1819 he became a Fellow of the Linnean Society; and he was for some time one of the Secretaries, and afterwards President of the Geological Society. He became an active member of the Zoological Society soon after its institution, and the Medical and Chirurgical Society elected him their Treasurer; and he gave Lectures on Chemistry for several years at the Medical School of Guy's Hospital.

His contributions to Medical and Scientific Journals, to Cyclopædias and to the Transactions of Societies, are stated to amount to sixty-nine; of which twenty were published in Nicholson's 'Journal,' or in the 'Annals of Philosophy,' eighteen in the 'Medico-Chirurgical Transactions,' and twelve in the 'Cyclopædia of Practical Medicine' and the 'Cyclopædia of Anatomy and Physiology.' Some of the more important of these papers were afterwards republished by him in a separate form. Such are his 'Account of the History and Present State of Galvanism,' and his 'History of Medicine.' But his most important work is his 'Elementary System of Physiology,' in three vols. 8vo, Lond. 1824—1827, of which a second and a third edition have since appeared, the last comprised in one very thick 8vo volume. This is justly regarded as the best text-book of Physiology,

being a most elaborate compilation of all that had been previously published, both as regards facts and theories, in this highly important and extensive field of inquiry, together with exact and scrupulous references to the original authorities for every statement and to the sources from which more detailed information may be derived. He subsequently projected a new translation of Pliny's 'Natural History,' of which he printed the first and thirty-third books as a specimen for private distribution, in 1828, and in which he had made considerable progress at the time of his decease. For two or three years before his death his health had been gradually declining, and he finally sank under an attack of cholera on the 6th of August 1846.

William Bridgman, Esq., F.R.S. &c., became F.L.S. in 1799, and died on the 6th of January 1847.

Mr. Lionel Dietrichsen.

Sir Thomas Grey, Kt., M.D., F.R.S., was a native of the county of Selkirk, and became a surgeon in the Royal Navy in 1794. He was knighted for his professional services, first by the Lord Lieutenant of Ireland, and afterwards by the Prince Regent in 1819. He became a Fellow of the Linnean Society in 1814, was for many years a magistrate of the county of Kent, and died at St. Lawrence in the Isle of Thanet on the 17th of July 1846.

Charles Hatchett, Esq., was eminently distinguished for his knowledge of chemistry, as well as for his amiable disposition and liberal spirit. A detailed account of his life and writings will probably be given elsewhere, but it is right that he should be mentioned here as the founder (in conjunction with the late Sir Everard Home) of the Animal Chemistry Society, consisting of a very few members of the Royal Society, who met at distant intervals under a regulation that the papers read at their meetings should be afterwards communicated to the parent body. Many valuable papers (and among them several by Mr. Hatchett himself) communicated by this Society are printed in the 'Philosophical Transactions.'

Mr. Hatchett became a Fellow of the Linnean Society in 1795, and of the Royal Society in 1797. He contributed to the eighth volume of our 'Transactions' a paper entitled "Some Account of the Pitch Lake in the Island of Trinidad, in two Letters: the first from Samuel Span, Esq., to James Tobin, Esq., F.L.S.; and the other from Mr. Tobin to Charles Hatchett, Esq., F.R.S. and L.S.; with observations by Mr. Hatchett." His death took place in February of the present year, at an advanced age.

George Loddiges, Esq., was born on the 12th of March 1784, at

Hackney, where his father Conrad Loddiges, a German by birth, had established a Nursery and Botanical Garden, which under his able superintendence, and since his death under that of his two sons, has attained the highest reputation both at home and abroad. Among its most remarkable features are the collection of *Orchideæ*, of which a catalogue, extending to upwards of 1900 species and varieties, was published in 1845; and the noble series of 280 Palms, which can scarcely be rivalled in variety and beauty of growth. The house in which the latter are contained was designed without the intervention of an architect, and entirely erected with the assistance only of the workmen employed in the garden.

At an early period Mr. George Loddiges became a Fellow of the Horticultural Society, of which he was for some years one of the Vice-Presidents; and in 1821 he was elected into the Linnean Society, and has several times been placed upon its Council. He commenced in 1818, in conjunction with his brother, the publication of a work of plates illustrative of the plants cultivated in the nursery at Hackney, under the title of the 'Botanical Cabinet,' and continued it until the number of figures amounted to 2000, of which a large proportion were drawn by himself. His taste for art had induced him to form an extensive collection of impressions of gems from the antique, and he had brought together about 1000 specimens of woods, cut and polished for the better exhibition of their characters. He was also much attached to microscopical investigation, anxious to possess the best and most recent improvements in the instrument, an accurate observer and a skilful manipulator. But in nothing were his attachment to natural history, and his skill and taste in the preparation and arrangement of his subjects, more strongly manifested than in his unrivalled collection of Humming-Birds, which extends to more than 200 species, in various states of age and plumage, to the collection and mounting of which he had devoted during twenty years a large portion of his time. It had long been his intention to publish a work illustrative of this beautiful tribe of birds; but although he had collected much valuable information respecting them, he appears not to have made any advance towards putting it in a state for publication. He died on the 5th of June 1846, at the age of 60, leaving behind him the character of a man of great amiability of disposition, extensive information and liberal spirit.

Hugh Percy, Duke of Northumberland, was born on the 20th of April 1785. He was educated at Eton and afterwards at St. John's College, Cambridge, and took his degree of A.M. in 1805, and that of LL.D. in 1809. In 1812 he was called to the House of Peers by

the title of Baron Percy, and in 1817 he succeeded his father in the Dukedom. He had previously sat for several years in the House of Commons, and he afterwards filled several dignified and important offices in the State, being selected to represent the King of England at the Coronation of Charles X. of France, and afterwards to fill the office of Lord Lieutenant of Ireland, under the Administration of the Duke of Wellington and Sir Robert Peel.

His leisure hours were much employed in the study of botany, astronomy and mechanics. To the University of Cambridge (which had elected him its Chancellor) he presented a large telescope with an object-glass of 12 inches diameter, and one of the latest acts of his life was to give to the University of Durham a similar telescope, with a portable observatory, so adjusted that it might be erected in the most eligible situation for taking observations.

On his garden at Syon (a garden known to botanical science for nearly three centuries, and from whence Dr. Turner, the author of the first English Herbal, dates the preface of his book) his Grace annually expended large sums. The garden was greatly improved by the erection of an elegant, extensive and lofty range of conservatories; and considerable success was attained in the effort to cultivate various tropical fruit-trees, with a view to the ripening of their fruit. In this object the Duke followed up the example of his father-in-law, the late Lord Powis, whose collection of tropical fruit-trees had been transferred to Syon at his decease. At various times collectors were also sent out by the Duke, either entirely at his own expense, or in conjunction with others, with the view of introducing horticultural novelties, and many rare and interesting plants which flowered or fruited for the first time at Syon were the result of these expeditions.

His Grace died at Alnwick Castle on the 11th of February in the present year. His Fellowship of the Linnean Society dates from the year 1833; and he had been for several years a Trustee of the British Museum on the nomination of the Queen.

John Parkinson, Esq., F.R.S. &c., was the son of a gentleman who became possessed by the chances of the Lottery of the noble museum formed by Sir Ashton Leven at an expense of upwards of 50,000*l.* This was the means of introducing our late Fellow to Dr. Shaw of the British Museum, with whom he became closely intimate, and to many other eminent naturalists, from whose conversation he imbibed a considerable taste for the pursuits in which they were engaged. From an early period of his life he was employed in the service of the Government, first as Paymaster of French Refugees, and afterwards as British Consul successively at Königsberg, Pillau, Memel,

Pernambuco, Bahia and Mexico. In these various localities, especially in the latter, his position and his taste enabled him to render considerable services to botany by the introduction of new and valuable plants, for many of which our conservatories are indebted to his active exertions.

He retired from public service a few years ago, and has since been a frequent attendant at our meetings, taking a lively interest in the proceedings of the Society, of which he had been for nearly fifty-two years a Fellow. He died at Paris on the 3rd of April in the present year.

Edward Rudge, Esq., was descended from a merchant and alderman of London of the same names, who in 1664 purchased of Mr. William Courten (whose collections in natural history formed the foundation of the Sloanean Museum) a large portion of the Abbey estate at Evesham, to which estate our late member succeeded, and to which he also made considerable additions. He was born on the 27th of June 1763, and derived his taste for botany, which he early cultivated by the collection of British plants, from an uncle, who commenced the formation of an herbarium, which was followed up and greatly added to by the nephew. The acquisition of a fine series of the plants of Guiana collected by M. Martin, a French collector of great skill and judgment, who lost by the fortune of war two successive and valuable collections of plants, induced him to turn his attention more particularly towards the flora of that country, and he published in 1807 a folio volume of selections, carefully made, under the title of 'Plantarum Guianæ Rariorum Icones et Descriptiones.' The illustrations to this volume, in the preparation of which he derived some assistance from Mr. R. A. Salisbury, were from the pencil of the first Mrs. Rudge.

Mr. Rudge became a Fellow of the Linnean Society in 1802, and communicated several papers to its 'Transactions' in the course of the ten following years. These are severally entitled—

"Descriptions of some species of *Carex* from North America," vol. vii. p. 96.

"Descriptions of seven new species of Plants from New Holland," vol. viii. p. 291.

"Description of a new species of *Dimorpha*," vol. ix. p. 197.

"A description of several species of Plants from New Holland," vol. x. p. 283.

"A description of several new species of Plants from New Holland," vol. ii. p. 296.

In the eighth volume of our 'Transactions' Mr. R. A. Salisbury

paid him the merited compliment of dedicating to him a genus of plants under the name of *Rudgea*, described and figured from specimens of two species in Martin's Guiana collection, which (as far as I am aware) have not yet been met with by any other collector.

In 1805 he became a Fellow of the Royal Society; and he subsequently connected himself with most of the leading Societies of the metropolis, taking an active interest in their pursuits and being frequently placed upon their Councils. At an early period he became a Fellow of the Society of Antiquaries, and as an antiquary he has considerable merit. At intervals between 1811 and 1834 he carefully excavated those portions of the ancient Abbey of Evesham which were under his control, and the results were communicated to the Society of Antiquaries, who not only inserted his memoirs in the 'Archæologia,' but also made the ruins and relics brought to light by these excavations the subject of a series of large plates in their 'Vetusta Monumenta.' An octagonal tower of stone erected by him in 1842 on the battle-field of Evesham, commemorative of Simon de Montfort, Earl of Leicester, further marks the bent of his mind towards antiquarian studies.

Mr. Rudge died at the Abbey Manor House, Evesham, on the 3rd of September last, at the age of 83. In his will he gave a proof of his attachment to the Linnean Society, of which he had so long been a member, by bequeathing to it the interest of a sum of 200*l.* for the purpose of establishing a medal, the particulars of which, and the reasons which actuated the Society in relinquishing the bequest, are given in detail at p. 315.

Lord Saye and Sele was from his earliest days fond of ornithology, and had studied and understood the birds of the British Islands, of which he formed a very fine collection, at present arranged at his family residence of Belvidere, and in an excellent state of preservation. Excepting a small aviary of exotic birds at his residence in Grosvenor Street, his lordship confined his collection to our native birds, but he was a very liberal supporter of publications on all branches of Natural History. He also took considerable interest in and contributed rather largely to the Ornithological Society in St. James's Park, where at one time he was a constant and almost daily visitor. He was elected a Fellow of the Linnean Society in 1822, and died in the spring of the present year.

Richard Simmons, Esq., M.D., was the only son of Dr. Samuel Foart Simmons, a medical practitioner of great skill, especially in the treatment of lunacy, and took his degree at Oxford in 1809. He was a Fellow of the Royal College of Physicians, and enjoyed a pen-

sion from the Crown in consideration of his own and his father's services during the mental illness of King George the Third. He became a Fellow of the Linnean Society in 1802, and died on the 18th of September last at St. Leonard's on the Sea, bequeathing a collection of fourteen pictures to the National Gallery, and a collection of minerals to the University of Oxford, to which he had also presented numerous very valuable specimens through the present Dean of Westminster in 1832.

Samuel Solly, Esq.

Daniel Stuart, Esq., well-known for more than half a century as a political writer, and as a proprietor of various leading newspapers, became a Fellow of the Linnean Society in 1806, and died at his house in Upper Harley Street, on the 25th of August last, at the age of 80.

William Nicholas Wickham, Esq., was one of our oldest Fellows, having entered the Society in 1794. He married a daughter of Dr. Latham the ornithologist, and died at Winchester in the course of the last year.

In our *Foreign* list we have lost since the last Anniversary two distinguished members.

The Baron Benjamin Delessert, eminent alike for his private worth and for his enlightened patronage of natural history, was born at Geneva in the year 1763, of a family whose attachment to botanical pursuits is manifested by the 'Lettres Élémentaires sur la Botanique' of Rousseau, which were addressed to Madame Delessert, the mother of our late member, for the instruction of his sister, then a child. His elder brother Etienne was also fond of natural history, and in his company Benjamin in early life travelled through Switzerland, France, England and Scotland, and made considerable collections of the plants of those countries, which were afterwards incorporated in his herbarium. At the commencement of the revolution he served as an Artillery officer; but after the 10th of August he quitted the service, and from that time forwards applied himself to commercial pursuits, in which he was eminently successful, and became one of the most wealthy bankers in Paris. He was also at one time the most considerable manufacturer of beet-root sugar in France; but this speculation, in which he appears to have embarked chiefly from motives of patriotism, was not attended with much success. For nearly thirty years he sat in the Chamber of Deputies as one of the members for the Department of the Seine, and took a lively interest and an active part in all measures for improving the condition and

the morals of the poorer classes. Thus he is regarded as the founder of Savings' Banks in France; and his efforts were always strenuously directed to the amelioration of prisons and of prison discipline, and the abolition of the punishment of death. As a politician he sat in the Chamber constantly in the left centre, of which he was one of the most influential members, although he rarely took a prominent part in the debates.

M. Benjamin Delessert was a distinguished patron of the arts, of literature and of science, the professors of which owe much to his zeal and liberality. His herbarium has long been regarded as one of the richest in the world; and a recent publication by M. Lasègue, entitled '*Musée Botanique de M. Benjamin Delessert*,' Paris, 8vo, 1845, gives an interesting account of the numerous collections of which it is composed. There are few systematic botanists who have published extensively in recent times who have not derived advantage from consulting its stores, which were always opened with the utmost liberality to the use of students and men of science. His botanical library too, consisting of upwards of 4000 volumes, formed an admirable and indispensable appendage to his collections. In 1820 M. Delessert commenced the publication of a series of figures chiefly from specimens in his own herbarium, illustrative of DeCandolle's great work, and issued at intervals five volumes, each of 100 plates, under the title of '*Icones Selectæ Plantarum quas in Systemate Universali ex Herbariis Parisiensibus præsertim ex Lessertiano descripsit Aug. Pyr. DeCandolle, ex archetypis speciminibus a P. J. F. Turpin delineatæ.*' The '*Floræ Senegambiæ Tentamen*,' edited by MM. Guillemin, Perrottet and A. Richard, was also published at his expense.

M. Benjamin Delessert had early commenced the formation of a collection of Shells, but these were until within the last few years of comparatively little importance. The purchase, however, of Dufresne's collection, of Teissier's, and more particularly of that of Lamarck, to which great additions had been made while in the possession of Prince Masséna, rendered M. Delessert's cabinet of Shells one of the finest and most valuable that exists. As in the case of his herbarium, he was careful to render it useful to science, and he has within the last few years published several parts of a magnificent work entitled '*Recueil de Coquilles décrites par Lamarck dans son Histoire Naturelle des Animaux sans Vertèbres et non encore figurées*,' Paris, 1841, &c., fol. This has since been followed up by a still more splendid contribution to science, entitled '*Illustrations*

Conchyliologiques, ou Descriptions et Figures de toutes les Coquilles connues vivantes et fossiles,' edited by M. Chénu, the Conservator of the Collection, of which upwards of sixty numbers, containing more than 300 plates, are already published.

M. Delessert died at Paris on the 1st of March in the present year. He had long been a Member of the Academy of Sciences of the Institute of France, and had received various honorary distinctions from his Government. His election as a Foreign Member of the Linnean Society dates from 1835. It should not be omitted that he has provided in his will for the maintenance of his museum and his library, and for rendering them useful to science by their continued accessibility.

Of the events of the life of *Henri Dutrochet, M.D.*, I have been able to procure but little information. He commenced his career in 1806, by the publication of an inaugural dissertation entitled 'Essai d'une Nouvelle Théorie de la Voix;' and subsequently distinguished himself as an able physiologist, chiefly by the application of the principles of physics to the explanation of various phænomena of organization. In 1837 he collected together the most important of his numerous contributions to Anatomy and Physiology in two 8vo volumes, under the title of 'Mémoires pour servir à l'Histoire Anatomique et Physiologique des Végétaux et des Animaux.' Many of the memoirs contained in these volumes are entirely rewritten, and as he declares in his preface that he considers all that he had previously written on the subjects treated of and not reproduced in them as non-existent, they must be regarded as containing the latest and most matured expression of his views. His memoirs relate to a great variety of subjects, but those which have exercised the most important influence on science, and on which his fame will principally rest, are devoted to the exposition of the phænomenon to which he has given the name of *endosmose*. By means of this simple physical law which regulates and controls the motions of fluids of different degrees of density separated from each other by permeable membranes he has himself explained, and furnished to others a most important element in the explanation of, many obscure and previously unintelligible processes in the economy both of animals and plants.

He was a Member of the Academy of Sciences of the Institute of France, and became a Foreign Member of the Linnean Society in 1839. He died on the 4th of February in the present year.

Among our *Associates* we have to record the death of

Charles Sutton, D.D., who was born at Norwich on the 6th of
No. XXXIV.—PROCEEDINGS OF THE LINNEAN SOCIETY.

March 1756, and died in the parish of St. George at Tombland, of which he had been for more than fifty years Perpetual Curate, on the 28th of May 1846, and consequently in the ninety-first year of his age. Dr. Sutton was educated at the Grammar-School at Norwich, whence he proceeded to St. John's College, Cambridge, and took honours as the tenth wrangler of his year. He became a Fellow of the College, and was successively presented to the incumbencies of St. George at Tombland, Alburgh and Thornham cum Holme juxta mare, at which latter place, situated on the north coast of the county of Norfolk, our distinguished Fellow the Rev. Mr. Kirby, whose sister he had married, occasionally passed a part of the summer with him. It was here and in his company that Mr. Kirby discovered the new and highly beautiful species of *Apion*, which he has described and figured in the 9th volume of our 'Transactions' under the name of *Apion Limonii*.

Dr. Sutton was exceedingly zealous in the discharge of his clerical duties, and warmly promoted the interests of many charitable and educational institutions with which he became intimately connected. He was one of the oldest members of the Christian Knowledge Society; for many years Secretary of the Norwich National Society, and Treasurer of the Norfolk Society for the Relief of Clergymen's Widows and Orphans; and for a long period took an active part in the management of the Norfolk and Norwich Hospital. For some years past his great age had of course precluded him from continuing this active course of life, but he retained his mental faculties and bodily strength to a very late period of his life.

He became early attached to botanical pursuits and to the study of natural history in general as well as to antiquarian researches. His first and friendly instructor in botany was Mr. Pitchford, a surgeon in Norwich, whose botanical merits are commemorated by our first President in a memoir on Norwich Botanists in the 7th volume of our 'Transactions.'

In 1791 he was elected an Associate of the Linnean Society, and in 1797 he contributed to the 4th volume of our 'Transactions' a paper entitled "A description of five British species of *Orobanche*," in which he distinguished two new species, viz. *Orob. elatior* and *Orob. minor*, and made some useful observations on the economy of the genus as well as some rectifications of the synonymy of its species.

The Secretary also announced that twenty Fellows had been elected since the last Anniversary.

At the election, which subsequently took place, the Lord Bishop of Norwich was re-elected President; Edward Forster, Esq., Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out: viz. James Scott Bowerbank, Esq.; William John Burchell, Esq., D.C.L.; Frederic Halsey Janson, Esq.; Daniel Sharpe, Esq., and Nathaniel Wallich, Esq., M.D.

June 1.

The Lord Bishop of Norwich, President, in the Chair.

Sudlow Roots, Esq., was elected a Fellow.

Read a "Description of *Athalamia*, a new genus of *Marchantieæ*."
By Hugh Falconer, M.D., F.L.S. &c.

ATHALAMIA.

CHAR. GEN. *Flores masculi? Capituli fœminei receptaculum nullum; floribus* immediatè pedunculo insertis, erectis. *Involucrum nullum. Involucella* tubulosa, vertice bivalvia, basi inter se connata. *Calyptra* persistens, sub-bifido-lacerata. *Sporangium* in lacinias 4 v. 5 demùm revolutas dehiscens; pedicello elongato sub-exserto.—*Frons simplex, v. radiatim 3-loba, crassè carnosa, subtùs margine squamis foliaceis pluri-seriatis instructa; lobis oblongis, concavis, margine attenuatis; pedunculo pedicellisque crassis, succulentis, teretibus.*

ATHALAMIA PINGUIS, *Falc.*

Hab.

The absence of a common receptacle and the erect flowers appear to be the most characteristic marks of the genus *Athalamia*, which is most nearly allied to *Lunularia*, Micheli, in the dehiscence of the sporangium and elongation of the pedicel.

Read also a further portion of Dr. Buchanan Hamilton's Commentary on the 8th part of Van Rheedé's *Hortus Malabaricus*.

June 15.

The Lord Bishop of Norwich, President, in the Chair.

Edward Phillips, Esq., M.D., and the Rev. William Smith were elected Fellows.

Read "Some Account of an undescribed Fossil Fruit." By R. Brown, Esq., D.C.L., V.P.L.S. &c. &c.

This singularly beautiful and instructive fossil, which had for many years formed part of the collection of Baron Roget in Paris, was brought to London in 1843, and purchased jointly by the British Museum, the Marquis of Northampton and Mr. Brown. Nothing is known of its origin, but from its obvious analogy in structure and mineral condition with *Lepidostrobus*, Mr. Brown conjectures it to belong to the same geological formation.

The specimen is evidently the upper half of a strobilus very gradually tapering towards the top. As brought to England it was not quite two inches in length, but a transverse slice, probably of no great thickness, had been removed from it in Paris; and the transverse diameter of the lower slices somewhat exceeded the length of the specimen. Its surface, which was evidently water-worn, is marked with closely approximated unequal-sided hexagons, which are the terminations of bractæ, and become smaller and less distinct towards the top.

From transverse and vertical sections it appears that the strobilus is formed of a central axis of small diameter, compared with the parts proceeding from it, which consist:

1. Of bractæ, densely approximated and much-imbricated, having their lower halves at right angles to the axis, while the imbricating portion, of equal length with the lower and forming an obtuse angle with it, is gradually thickened upwards. These form the spokes and external rhomboidal areae seen in the transverse section.

2. Of an equal number of oblong bodies, of a lighter colour and more transparent, each of which is adnate to and connected by cellular tissue with the upper surface of the corresponding bractea. These bodies are sections of *sporangia*, filled with innumerable microscopic *sporules*, originally connected in threes, very rarely in fours, but ultimately separating. From this triple composition or union of *sporules*, which differs from the constantly quadruple union in tribes of existing plants, namely *Ophioglosseæ* and *Lyc-*

podiaceæ, which from other points of structure may be supposed to be most nearly related to the fossil, Mr. Brown has named it *Triplosporite*.

The structure of the axis, which is well-preserved, distinctly shows, in the arrangement of its vascular bundles, a preparation for the supply of an equal number of bracteæ. These vascular fasciculi are nearly equidistant in a tissue of moderately elongated cells. The vessels are exclusively scalariform, very closely resembling those of the recent *Ferns* and *Lycopodiaceæ*, and among fossils, those of *Psarolites*, *Lepidodendron* and its supposed fruit *Lepidostrobus*, as well as several other fossil genera, namely *Sigillaria*, *Ulodendron* and *Diploxyton*.

Mr. Brown does not propose to enter fully into the question of the affinities of *Triplosporite*; but contents himself with remarking that in its scalariform vessels it agrees with all the fossil genera supposed to be *Acotyledonous*; and that in the structure of its sporangia and sporules it approaches most nearly, among recent tribes, to *Ophioglosseæ* and *Lycopodiaceæ*, and among fossils to *Lepidostrobus*, and consequently to *Lepidodendron*. The stem-structure of *Lepidodendron*, known only in *Lepidodendron Harcourtii*, offers no objection to this view, the vascular arrangement of the axis of its stem bearing a considerable resemblance to that of *Triplosporite*. To this argument, derived from the agreement between axis of stem and axis of strobilus, Mr. Brown attaches considerable importance, as an equal agreement exists both in recent and fossil *Conifera*.

Mr. Brown adds, that Dr. J. D. Hooker has very recently detected, in the sporangia of a species referred to *Lepidostrobus*, sporules united in threes; there still however remain, in the form and arrangement of the sporangia of that species, characters sufficient to distinguish it generically from the fossil here described.

The paper was illustrated by drawings, both of the natural size and microscopic.

Read also a note "On the occurrence of the Potatoe Disease independent of the Attacks of Insects." By J. O. Westwood, Esq., F.L.S., Secretary of the Entomological Society, &c. &c.

This note, in which the author maintained that the disease which has of late years been so destructive to the potatoe is wholly independent of the agency of insects, was illustrated by numerous recent specimens of the potatoe-plant, in which the disease had made considerable progress in the tuber, while the haulm appeared perfectly healthy; and on which the ravages of insects, and in particular of

the *Aphis* to which the devastation has been so confidently attributed, were nowhere to be traced.

November 2.

E. Forster, Esq., V.P., in the Chair.

James Hewitson Wilson, Esq., was elected a Fellow.

Mr. Westwood exhibited the following cases of insect monstrosities:—

1. *Chiasognathus Grantii*, with the left antenna deformed, furcate at the base of the serrated portion; one branch very short and apparently composed of four clavate joints, the other branch shorter than in the normal antenna and irregularly and shortly serrated; the lower division of the left mandible also shorter than that of the right side. From Mr. Westwood's collection.

2. A new species of *Elateridæ* from Ceylon, in Mr. Templeton's collection. The middle foot on the right side deformed; the coxa and trochanter normal, but with three femora conjoined at their bases, and emitting three perfect tibiæ, and two perfect and one imperfect tarsus.

3. An Indian *Copris* allied to *C. lunaris*, from Col. Hearsey's collection, in which the upper portion of the front of the head is wanting, exposing the parts of the mouth.

Read a paper "On the Natural History, Anatomy, and Development of *Meloë* (Third Memoir—the Anatomy)." By George Newport, Esq., F.R.S., F.L.S. &c.

Mr. Newport commenced this memoir by stating that having traced the Natural History of *Meloë* in the preceding memoirs, he now proposed to examine its Anatomy "with reference to those principles which regulate the formation of animal bodies, and which seem to be the links of connexion that associate peculiarities of instinct with the evolution and with the functions of special structures."

The portion read was the first section of the third memoir, the *tegument* of the young larva. This structure was shown to be the primary and essential foundation-tissue of the organized being, having

its origin in the *blastoderma*, and being composed entirely of cells, like the young tissue of plants. The form of the body of the embryo entirely depends on the changes which take place in this structure, and the principles which regulate these changes regulate also those of the whole life of the insect.

The growth of the tegument of the young larva Mr. Newport showed to depend on the division of the nuclei of its cells; that the subsequent consolidation of the tegument in the formation of the hardened dermo-skeleton of the insect is the result of the secretion of earthy materials by the nuclei of the tegumentary cells, in a manner similar to that in which bone is formed in the *Vertebrata*, by the calcification of the cells in layers of the surface of the periosteum, as shown by Hunter, Flourens, Goodsir, Sharpey, Tomes and others; and that this is analogous to the mode in which the woody fibre of exogenous trees is formed on the inner surface of their bark. The earthy constituents of the dermo-skeleton were stated, from the chemical analyses of Odier, Lassaigne and Mr. Children, to consist chiefly of phosphate of lime, with carbonates of potass and lime, and a little phosphate of iron, and in some species with traces of silica, magnesia and manganese; materials which, ten years ago, led Mr. Newport to describe the dermo-skeleton of insects as "an imperfectly-developed condition of bony matter," a view which has recently been much supported by the discovery by Platner of star-shaped corpuscles in the tegument of the silkworm, closely resembling those of true bone in the *Vertebrata*.

The tegument of insects is thus regarded as analogous in its mode of development, as in its function, to that of the skeleton of the Cheilonian Reptiles. This structure in the very young *Meloë* was then fully described, and the nature of its appendages and functions examined. The spines and hairs were shown to originate from the centre of tegumentary cells, and were regarded as excessive developments of the nuclei as single bodies. The growth and development of the tegument was shown to be effected by means of the enlargement and fissiparous division of the nuclei of the cells, and the subsequent expansion of these into cells, the nuclei of which undergo similar changes. This was pointed out as being strongly confirmatory of the theory of Schwann with reference to the tissues generally, and as being in full accordance with the observations of Kölliker on the yolk cells, and with original observations which Mr. Newport has himself made on other structures.

The formation of the external respiratory organs was then exa-

mined. These were shown to commence in the tegument in spaces between the cells, which open into follicles connected with sinuses in the granular tissue of the body, and that the orifices (the spiracles) at first very closely resemble the stomata of plants. The parietes of these follicles in *Meloë* are formed by aggregations of exceedingly minute, nucleated embryo-cells of rounded shape, and about one five- or one six-thousandth of an inch in diameter.

The tegument of the head, and more especially that of the eye of the young *Meloë* was then examined, and the cornea, which in this stage of the insect's existence is a single structure, fitted only for near vision, was shown to be composed of numerous transparent dermal cells, continuous with those which form the surface of the head, while the centre of the cornea, the axis of vision, is occupied by a single cell, more projecting and twice the size of those which surround it.

The changes which take place in the relative development of different parts of the tegument of the young *Meloë*, which lead to its entire alteration of form, were then pointed out, and shown to occur chiefly in the rapid growth of the dorsal region, which from being originally the smallest, as it is the last-formed part of the body, becomes the most voluminous, and occasions a complete alteration in the position and size of the limbs and in the entire form of the insect.

The stages of this process and the formation of the dermo-skeleton, the author proposed to be considered in the next section of this memoir.

November 16.

The Lord Bishop of Norwich, President, in the Chair.

Samuel Brownlow Grey, Esq., was elected a Fellow.

E. Doubleday, Esq., F.L.S., read a paper "On the Pterology of the *Diurnal Lepidoptera*, especially upon that of some genera of the *Heliconidæ*."

After expressing his regret at the little attention bestowed in this country upon the anatomy of the *Annulosa*, the writer proceeded to remark that he was not aware that any author had recorded the fact of a sexual variation in the neuration of the wings of *Lepidoptera*, a

fact extremely interesting from the light it throws on the homologies of the nervures and nervules.

The variation takes place in the genera *Ithomia*, *Mechanitis* and *Sais*, all remarkable also for the great sexual variation in the structure of the anterior legs, those of the males being the least developed, those of the females the most developed, of any butterflies with suspended pupæ.

The state of atrophy of the anterior feet of the males is not, he states, the consequence of excessive development of the other pairs of feet, or of any other organs, nor does it appear to depend on any peculiar habits of the insect; neither can the greater development of these feet in the females be accounted for by any difference of habits. For the more developed anterior feet of some male *Coleoptera*, for the powerful jaws of the leaf-cutting or timber-boring bees, there are obvious uses; but a greater development in the one sex of organs almost atrophied in the other, which still leaves them unfitted for the functions they perform in a normal state, and apparently does not render them useful for any other function, can only be explained by conceiving it in some way to depend on the position of the animal in the system of Nature.

The system of neuration of the posterior wings in the *Diurnal Lepidoptera*, which may be considered normal as regards this group, is abnormal as it respects the whole order; and it would seem as though Nature, by a partial return to a normal structure in a few genera, wished to indicate to us the real homologies of these parts.

In general the posterior wings of the *Diurnal Lepidoptera* have the discoidal nervure, which in these wings never branches, so placed as to seem to be a third subcostal nervule; but in some genera, although its basal is always wanting, its real character is very evident, and it is united to the subcostal nervure or one of its nervules, and also to the median nervure or one of its nervules, by distinct upper and lower disco-cellular nervules. In the *Heliconidæ* we find this structure, almost normal as it respects the order, in the genus *Ituna*, and also in *Ithomia*. It is found in some female *Ithomia*, of which the males have a different structure, giving indications of that change of position which in the next genus might lead us to mistake the discoidal nervure for a fourth median nervule, the disco-cellular nervules being placed more obliquely, the cell becoming thereby more elongated, and the lower disco-cellular nervule appearing almost to form a continuation of the median nervure. In *Mechanitis* both sexes have

this character further carried out, and the wing appears to have a subcostal nervure dividing into two nervules, and a median dividing into four, so completely has the discoidal nervure assumed the position of a branch of the latter nervure. The females of the genus *Sais* have also this character, but in the males we find a still further change of structure. In these the second subcostal nervule assumes the position of a fifth median nervule, and the subcostal nervure consequently appears simple.

Thus, leaving the genera *Heliconia*, *Lycorea* and their immediate allies, which have the structure which is normal as regards the *Diurnal Lepidoptera*, though abnormal as regards the order, we find in *Ituna* and some female *Ithomiæ* a structure nearly normal as regards the whole order, but the males of the latter become abnormal in an opposite manner to the prevalent character of the group; next in *Mechanitis* we find this structure common to both sexes; and then in *Sais*, the females retaining the same structure as in *Mechanitis*, but the males varying still further from the type.

This gradual change in the position of the discoidal nervure actually occurring first in the two sexes of the same species, and then becoming common to both sexes, is, in the opinion of the writer, confirmatory in the highest degree of the theory laid down by him in a former paper, as to the structure of the anterior wings of the *Diurnal Lepidoptera*, and leaves, he thinks, no room to doubt the correctness of the explanation there given of the apparent anomaly of those wings in the *Papilionidæ*.

In the sexual variations detailed above, it is the male insect which varies most from the type, but the females of some species of *Mechanitis* present a remarkable structure in the anterior portion of the wing, the costal nervure being united to the subcostal for the greater part of its course.

An additional interest attaches to these peculiarities of the wings, from their being combined with the great peculiarities above referred to in the structure of the anterior feet.

The writer then proceeded to point out some analogies in the structure of the wings of the *Ithomiæ* and some *Hymenoptera*, especially as regards the inner margin of the anterior wings and the anterior margin of the posterior wings, and also with reference to a fringe of hairs on the latter, analogous to the hooks occupying the same position in the Bees and other *Hymenoptera*.

December 7.

E. Forster, Esq., V.P., in the Chair.

Lieut.-Colonel John Bennett Hearsey was elected a Fellow.

Read a "Description of a new genus of *Lentibulariæ*, with remarks on some Indian species of *Utricularia*." By M. Pakenham Edgeworth, Esq., F.L.S. &c.

Gen. Nov. DIUOSPERMUM.

Calyx bilabiatus, labio superiore 2- (rarius 3-) dentato. *Corolla* bilabiata, tubo brevi, labio superiore brevissimo truncato, inferiore 3-dentato. *Stamina* inclusa. *Stylus* brevis, stigmatibus dilatato. *Capsula* ovata, oligosperma; placentâ centrali liberâ conicâ in apicem productâ. *Semina* pauca (prope 6), ovata, testâ laxâ striato-rugosâ, utrinque pilis paucis longis caudata. *Nucula* compressa, submarginata. *Embryo*? —Herba *pusilla*, *acaulis*, foliis *radicalibus*, radicibus *utriculiferis*.

DIUOSPERMUM ALBUM.

Hab. super rupes madidos, in Vishnugangetis valle, Himala; alt. 8000 ped.

This little plant, the author thinks, forms a link connecting *Lentibulariæ* with *Cyrtandraceæ*, to which order its tailed seeds show an approximation. Unfortunately he has not been able to separate the embryo so as to be satisfied with its nature and direction. In habit it resembles slightly some of the section *Oligocista* of *Utricularia*.

UTRICULARIA (subgenus *Oligocista*) FOVEOLATA, radicibus fibrosis brevibus, scapo simplici aphylo 2—6 floro racemoso sinistrorsum volubili, bracteis solitariis ovatis acutis basi-fixis pedicello vel longioribus vel multo brevioribus, lobis calycinis pedicello longioribus ovatis acutis corollam subæquantibus in fructu cum pedicello defracto valdè auctis, corollæ labio inferiore vix concavo margine 3-lobo superiore bifido: calcar conico labii inferioris longitudine, capsulâ cernuâ calyce aucto obtectâ, seminibus majusculis compresso-trapezoideis rugoso-foveolatis foveolis nitidis punctatis.

Hab. in Bengaliâ, uliginosis, Januario.

An *U. uliginosa*, DC., no. 66. vol. viii. p. 15? Flos purpureus, scapus rubescens.

UTRICULARIA POLYGALOIDES, radicibus fibrosis, scapo aphylo erecto plus minus ramoso 2- v. multi-floro, squamis adpressis ovatis acutis, bracteis ternis exterioribus ovatis acutis interioribus subulatis pedicello com-

presso æqualibus vel longioribus, lobis calycinis ovatis acuminatis subæqualibus, corollæ azureæ calycem æquantis labio inferiore majore margine externe revoluto : palato convexo intus barbato : calcare conico albido labium æquante in lobo calycis inferiore nidulante ; labio superiore rotundato 4-crenato, capsulâ cordatâ compressâ lobis calycinis valdè acutis arcuatis obtectâ, seminibus rugoso-striatis.

Hab. in Bengaliâ, prope Bardwân, uliginosis, Januario.

An *U. reticulatâ*, DC., no. 90. p. 19? differt tantum (secus descriptionem) pedicellis bracteis brevioribus, labii superioris margine non revolutâ. Planta 2—10 pollicaris, stricta. Semina oblonga, testâ laxiusculâ rugoso-striatâ, inter nervulos prominulos minutius striatâ. Labium inferius 2 lin. long. Calycis lobi per anthesin 2, in fructu 4 lin. longi. Stamina filamenta arcuata ; antheris approximatis medio constrictis. Stigma sessile infundibuliforme. Folia nulla?

UTRICULARIA ROSEA, radicibus fibrosis, scapo filiformi subesquamato demùm subvolubili apice racemosim 3—10 floro, bracteis ternis exterioribus medio fixâ utrinque acutâ lateralibus ovatis acutis pedicello nitido subæqualibus, lobis calycinis rotundatis suborbiculatis corollâ brevioribus, corollæ roseæ labio inferiore 3-lobo (lobo medio brevioribus) crenulato intus fornicato palato luteo intus papilloso : calcare obtuso labium æquante ; labio superiore rotundato, filamentis arcuatis apice valdè dilatatis ; antheris ovatis medio paulò constrictis, capsulâ subglobosâ calycem vix auctum subæquante uno latere valvulâ sursum basi recurvatâ dehiscente, placentâ centrali globosâ foveolatâ, seminibus (plurimis abortivis) ovatis punctis prominulis subechinatis rugoso-striatis.

Hab. in Bengaliâ, prope Bardwân, uliginosis.

An *U. nivea*, DC., no. 98, at floribus roseo-purpurascens, capsulâ calycem æquante nec minore, nec longiore ut in *U. racemosâ*, squamis quoque minimis, an potius omnes in unam speciem reducendæ? Scapi calycesque rubescentes.

UTRICULARIA PTEROSPERMA, radicibus fibrosis parcè utriculiferis, utriculis 1-setosis, scapo aphylo purpurascens 2- (an pluri-?) floro ad axillam squamâ ovatâ obtusâ basifixâ bracteato, pedicellis teretibus superiore bracteolato, lobis calycinis obovatis cucullatis obtusis corollâ dimidio brevioribus nec in fructu auctis, corollæ luteæ labio superiore suberecto concavo integro ; inferiore integro marginibus revolutis : palato magno aurantio-striato utrinque glabro faucem obtegente : calcare sursum curvato conico acutiusculo labio sublongiore, staminum filamentis crassis arcuatis supra antheram 1-locularem nec constrictam productis, polline orbiculari rugosulo, stigmatibus bilamellato, capsulâ latere compressiusculâ subglobosâ stylo apiculatâ, placentâ globosâ alveolatâ, seminibus paucis latè alatis alâ irregulariter dentatâ reticulatim venosâ ; testâ irregulariter rugosâ ; nuculâ globosâ ; radiculâ et plumulâ distinctâ ceterum pingui.

Hab. in Bengaliâ, Bardwân, uliginosis, Januario.

Ab *U. diantha* quâcum maxime affinis differt pedicellis teretibus nec marginatis, calcare ascendente labio longiore nec descendente, lobis calycinis in fructu *non auctis* antherisque non constrictis. An semina *U. dianthæ* alata?

Utricularia fasciculata, vide DC., no. 8. p. 18. no. 18, adde :—Placentâ globosâ spongiosâ, seminibus compressis marginatis rugosulis uno latere foveolato altero prominulo.

A further communication, from a letter written by Mr. Edgeworth, dated Banda, 30th August, 1847, was made to the meeting, respecting a remarkable effect produced by the leaves of *Gymnema sylvestris*, R. Br., upon the sense of taste, in reference to diminishing the perception of saccharine flavours.

Read also a paper “On the Formation and Use of the Air-Sacs and Dilated Tracheæ in Insects.” By G. Newport, Esq., F.R.S., F.L.S. &c. &c.

The paper was commenced with the remark, that the presence of air-sacs in insects is known to every comparative anatomist. These sacs are largest and most numerous in the *Hymenoptera*, *Lepidoptera* and *Diptera*. They are numerous and capacious in the *Dragon-flies* among the *Neuroptera*, but are smaller and fewer in the *Ephemera*, the *Sialidæ* and the *Scorpion-flies*. In the *Coleoptera* they exist only in the volant species; and even in the same tribe, as in the *Carabidæ*, they are found in the winged, but not in the apterous species. In all insects in which they occur they are largest and most numerous in the swiftest and most powerful individuals. They are found in the *Orthoptera* only in the migratory families; while in those which are truly saltatorial insects the tracheæ are enlarged in some parts of their course, but are not to be regarded as properly sacculated, and sacs are never found in the larva state of any species of insect. The sacs are formed by the dilatation of tracheæ during the metamorphoses of the insects, which commences at the close of the larva state, when the insect has ceased to feed. This dilatation goes on for the first few days only in those species which hibernate, and is resumed again in the spring, but it continues uninterruptedly to the development of the perfect insect in those which change to that state in the summer.

The author showed that the longitudinal tracheæ of the third and fourth segments of the larva of winged insects give off a small branch at the sides of each segment, which, divided into two portions, passes outwards and “is involved in a fold of the new tegument that is

formed beneath the old skin of the larva some days before its change. These folds of tegument supplied each with their tracheæ closely resemble in appearance the external abdominal branchiæ of the aquatic larvæ of *Neuroptera*," and afterwards become the most important organs of the insect in its perfect state—the wings. The expansion of these organs at the change is mainly effected by their tracheæ, which instead of becoming dilated, like those within the body, are elongated, and thus induce a rush of blood into these portions of the tegument which promotes their expansion into wings. This elongation, as well as the dilatation of the tracheæ within the body, is the result of powerful respiratory efforts of the insect. The author remarked, that although able to show the mode in which these changes are effected, it is less easy to give a satisfactory explanation of the real use of the vesicles. He adopts, however, a view entertained by John Hunter, that the vesicles are mainly to enable the insect to alter the specific gravity of its body at pleasure during flight, and thus diminish the muscular exertion required during these movements. To support this opinion, the author reviewed the different classes of Vertebrata, and showed that although a vesicular form of the respiratory organs exists in the whole, yet that Birds approach much more closely to Insects in this respect, as well as in the more extensive distribution of the organs themselves, than any other of the Vertebrata; and he referred to the fact that in apterous insects, as in birds that are unaccustomed to flight, the respiratory organs are less capacious or less extensively distributed. This fact, he stated, is not confined to insects of which both sexes are apterous, but that when one sex is winged and active in flight, and the other apterous, he has always found the body of the former with vesicular tracheæ, while in the other, the apterous sex, the tracheæ are simply arborescent, as he has found in the sexes of the glow-worm, and in the common winter-moth, *Geometra trumaria*. These facts, inferential with regard to the use of the vesicles, the author supported with an account of an experimental observation on the mode in which the common dung-beetle prepares itself for flight, by rapidly increasing its respiration and distending its body the instant before it unfolds its wings and attempts to raise itself upon them.

December 21.

E. Forster, Esq., V.P., in the Chair.

Joseph Rix, Esq., was elected a Fellow.

Read a further portion of Dr. Buchanan Hamilton's Commentary on the 8th part of Van Rheede's *Hortus Malabaricus*.

January 18, 1848.

N. Wallich, Esq., M.D., in the Chair.

Arthur Adams, Esq., J. V. G. Gutch, Esq., Robert Hudson, Esq., George Ransome, Esq., and John Ellerton Stocks, Esq., M.D., were elected Fellows.

Read a paper "On the genus *Atamisquea*." By John Miers, Esq., F.R.S., F.L.S. &c.

Of this Capparideous genus, named by Mr. Miers in his 'Travels in Chile,' vol. ii. p. 529, and subsequently characterized by Sir W. J. Hooker in his 'Botanical Miscellany,' Mr. Miers gives the following more complete character, derived from the living plant.

ATAMISQUEA, Miers.

CHAR. GEN. *Sepala* 2, ovoidæa, concava, æstivatione marginibus subimbricatis, in torum carnosum, cyathiformem persistentem demùm induratum dentibus erectis notatum coalita, decidua. *Petala* 6, e margine tori orta, inæqualia, lineari-spathulata, reflexa; 2 superiora erectiora, æstivatione subimbricata; 2 lateralia breviora, exteriora. *Stamina* 9, quorum 6 fertilia longiora; *filamenta* æstivatione replicata, demùm recta, reclinata, glabra, basi glandulosa, lepidota; *antheræ* oblongæ, 2-loculares, basifixæ, erectæ, demùm curvatæ. *Thecaphorum* declinatum; basi glabrum, disco staminifero cinctum, hinc geniculatum; indè gracile, elongatum, et cum ovario lepidotum. *Ovarium* ovatum; *stylus* brevissimus; *stigma* obtusè 2-lobum. *Bacca* ovoidea, subcarnosa, densè lepidota. *Semina* 2 (vel abortu 1), exalbuminosa, cochleato-reniformia, funiculo libero erecto bifurcato ex imo loculo orto laterali-ter appensa; *testa* coriacea, loculo altero incompleto hilo opposito.

Embryo campylotropus; *cotyledones* magnæ, foliaceæ, incumbentes, invicem plicato-convolutæ; *radicula* teres, infera, loculo incompleto velata, et ob embryonis curvaturam hilum supernè spectans.—*Frutex durus, ramosus*, Americæ meridionalis extratropicæ; ramis *abbreviatis, junioribus lepidotis, nonnunquam spinescentibus*; foliis *e ramulis junioribus orta, parva, alterna, brevissimè petiolata, canaliculata, æstivatione conduplicata, subtùs lepidota, costâ carinatâ*. Pedunculus *axillaris, solitarius, 1-florus*.

Atamisquea emarginata, foliis lineari-oblongis basi apiceque emarginatis suprâ viridi-nitentibus subtùs hirsutis incanis squamisque lepidotis tectis.

Hab. in campis patentibus, aridis, salinis, Travesia dictis, Provinciæ Mendozae Chilensis.

Mr. Miers states that he offers the above view of the floral envelopes (which he regards as consisting of 2 sepals and 6 petals) with much deference, especially as that which Sir W. J. Hooker has taken of them is in conformity with the usual arrangement of the family. It appears to him, however, to be warranted by the fact that the two broad external leaflets (which he considers as the calyx) form one entire whorl, being continuous at their origin with the margin of the cup of the torus, while the insertion of the six narrower segments (petals) is also upon one line, within the margin of the same cup; the cicatrix of the calyx being marked by a clean line on the margin of the cup, while the remains of the claws of the petals are distinctly seen within the same margin forming so many projecting indurated teeth. This (as regards the calyx) is analogous with what occurs in *Busbeckia*, Endl., *Steriphoma*, Spr., and *Morisonia*, Plum., in all of which only 2 sepals exist, or an entire envelope bursting into two valves. To reconcile the apparent anomaly, the author would consider the floral envelope of *Atamisquea* either as formed of three series, each consisting of two normal parts, the innermost series appearing double in consequence of the division of its lobes to their point of insertion; (and this view is supported by the cohesion of the upper and lower pairs of petals at their base when pulled away from the torus, while a distinct interval is manifest between each of these pairs and the shorter lateral petals;) or he would (still taking the same view with regard to the composition of the upper and lower pairs of petals) regard them as forming with the two lateral petals a whorl of four parts, and suppose the outer series also (the sepals) to be normally four in number, united by adhesion into two. This last view he considers to be rendered somewhat the more probable by its approximating more nearly to the usual structure, and by the

fact that each of the sepals when dried readily splits down the middle by a clean line into two distinct segments.

The paper was illustrated by detailed illustrations of the structure of the plant.

February 1.

Robert Brown, Esq., V.P., in the Chair.

The Rev. James Hamilton and Henry George Harrington, Esq., were elected Fellows.

J. O. Westwood, Esq., F.L.S. &c., exhibited specimens of the silk spun by the caterpillars of the new Indian silk moth, *Bombyx Huttoni*, Westw. (figured in the 'Cabinet of Oriental Entomology,' pl. 12. fig. 4), communicated to him by Capt. T. Hutton. After stating the importance of the discovery of a new and valuable product of this nature in our foreign territories, and that the 'Transactions of the Linnean Society' contained a valuable paper on East Indian silk insects by Gen. Hardwicke, Mr. Westwood observed that the insect discovered by Capt. Hutton was congeneric with the real silk insect, *Bombyx Mori*, a native of China, whereas those described in the Transactions of the Society belonged to another genus, *Saturnia*, and that consequently the silk spun by the new species was likely to approximate nearer to that of *B. Mori* in its qualities than that of the large Indian *Saturnia*. The new species had been discovered to be a native of the hills about Mussooree, on the southern side of the Himalaya, 6500 feet above the level of the sea, and its caterpillar (like that of *B. Mori*) feeds on the leaves of the wild mulberry, which is another reason why the qualities of the silk should resemble that spun by the true silkworm. The perfect moth is about the size of *B. Mori*, but has darker-coloured wings, with a large, blackish lunate spot near the tips of the hooked forewings.

Specimens of the natural fibre of the silk, and some with the threads severally composed of three, six, nine and twelve fibres were exhibited, those with nine and twelve fibres having been pronounced by the Delhi silk-workers to be worth 25 rupees per seer, that is, about 25 shillings per pound, at 2 shillings per rupee.

Read a paper entitled "Descriptions of some new species of *Athyreus*, MacL., a genus of Lamellicorn Beetles." By J. O. Westwood, Esq., F.L.S. &c.

After tracing the history of the genus and its affinities, and noticing in detail its most remarkable peculiarities, dwelling particularly on those characters which are externally indicative of distinction of sex, Mr. Westwood proceeds to describe the following species :

1. *ATHYREUS GIGAS*, *Hope* ; castaneus, elytris magis rufis, capite glabro anticè 3-cornuto, mandibulis magnis externè acutè dentatis, pronoto utrinque excavatione profundâ discoque cornubus duobus crassis acutis divergentibus, elytris tenuissimè striato-punctatis.—Long. corp. unc. 1 (mandibulis inclusis).

Hab. in Brasiliâ. In Mus. D. Hope.

2. *ATHYREUS ARMATUS*, *Hope* ; piceo-niger, lateribus prothoracis mandibulis pedibusque rufescentibus, mandibulis magnis singulâ extûs 2-dentatâ dente antico magno, pronoto utrinque carinâ deflexâ medioque cornu suberecto, elytris elevato-striatis.—Long. corp. lin. 9.

Hab. in Americâ meridionali. In Mus. D. Hope.

3. *ATHYREUS SUBARMATUS*, ♀ ; suprâ obscurus nigricans, labro mandibulis prothoracis lateribus pedibusque piceo-rufis, tenuissimè granulosis, clypeo margine antico parùm reflexo posticè carinâ elevatâ in medio tuberculo instructo, antennis luteis, pronoto carinis duabus brevibus mediis in spatio medio ovali lineâ elevatâ circumcincto instructo.—Long. corp. lin. 8½.

Hab. in Americâ meridionali. In Mus. D. Hope, sub nomine *A. armatus*, ♀.

4. *ATHYREUS TUBERCVLATUS*, *Hope* ; obscurè piceus, sub lente tenuissimè granulosis et setosus, antennis luteis, clypeo conico anticè cornu parùm elevato terminato, pronoto tuberculis duobus contiguïs ante medium disci positis, elytris sublineatis, tibiis anticis 5-6-dentatis.—Long. corp. lin. 8½.

Hab. in Brasiliâ. In Mus. D. Hope.

5. *ATHYREUS ROTUNDUS*, *Hope* ; suprâ obscurus piceo-rufus, sub lente undique tuberculis minimis obsitus, clypeo margine antico truncato et parùm elevato margine postico carinâ tuberculis tribus acutis instructo, pronoto tuberculis duobus contiguïs ante medium elytrisque læviter striatis.—Long. corp. lin. 10.

Hab. in Brasiliâ. In Mus. D. Hope.

This insect Mr. Westwood thinks to be probably the female of *A. tuberculatus*.

6. *ATHYREUS BELLATOR* ; piceo-niger, capite et pronoto (marginibus ex-

ceptis) sublævibus hujus marginibus lateralibus pedibusque rufis vel fulvis, clypeo in dentem acutum elongato, pronoto dente elevato bifido pone medium armato.—Long. corp. lin. 10½.

Athyreus bifurcatus, Laporte, *An. Art.* iii. p. 102. pl. 7. f. 3. (nec *A. bifurcatus*, Klug, nec *A. bifurcatus*, MacL.)

Athyreus furcifer, *Dej. Cat. et Laporte, An. Art.* l. c. (teste Mus. Gory.)
Hab. in Brasiliâ et Cayennâ. In Mus. D. Hope.

The present species stands in Mr. Hope's collection as the male of *A. Bilbergii*.

7. *ATHYREUS BILBERGII*, Gray in Griffith *An. Kingd.*; piceo-niger, tuberculis minutis scaber, clypei margine antico recto postico carinato et 3-tuberculato tuberculo intermedio magis elevato, angulis lateribus capitis ante oculos acutis, pronoto margine antico parùm elevato; disco tuberculis duobus lævibus lineisque duabus curvatis elevatis.—Long. corp. lin. 10.

Athyreus furcicollis, *Dej.* (teste Mus. Gory, nunc Hope.)

Hab. in Demerarâ et Cayennâ. In Mus. D. Hope.

8. *ATHYREUS PHOLAS*, Buquet *MS.*; piceo-castaneus, lateribus prothoracis et elytrorum pedibusque rufescentibus, scabriusculus, clypeo anticè angustato margine antico bituberculato, vertice concavo, prothoracis lateribus dilatatis disco excavatione subquadrata spinâ erectâ anticâ lateribusque acutè tuberculatis.—Long. corp. lin. 6.

Athyreus trituberculatus, Gory in *Mus.*

Hab. in Colombiâ, Santa Fè de Bogota. In Mus. Hope.

Obs. *Athyreus recticornis*, Guérin, *Iconogr. du Règne An. Ins.* p. 83, from Swan River (Mus. Gory) = *Bolboceras hastifer*, Bainbridge.

The insect placed in M. Gory's collection, with the label of *Athyreus porcatus*, De Laporte, *Anim. Artic.* t. ii. p. 103. no. 6, *Athyreus Senegalensis*, Dejean, is a new species of *Bolboceras*, from Senegal.

9. *ATHYREUS PURPUREIPENNIS*; cyaneo-niger subtùs fulvo-testaceus, elytris lætè purpureis, pronoto lineâ longitudinali impressâ utrinque spatio convexo lævissimo nigro versus angulos anticos furcato.—Long. corp. lin. 6.

Hab. in Americâ meridionali. In Musæo Britannico.

10. *ATHYREUS CENTRALIS*; testaceo-fulvus, capitis vertice anticè 3-dentato, pronoto carinâ abbreviatâ centrali lineis duabus parum elevatis obliquis alterâque utrinque prope angulos posticos, elytris impresso-striatis striis longe ante apicem evanescentibus.—Long. corp. lin. 6½.

Hab. in Novâ Grenadâ, Rio Magdalena, Ibaque. In Musæo Britannico.

11. *ATHYREUS TWEEDYANUS*; testaceus, pronoto maximo lateribus obtusè angulatis et sinuatis medio disci depresso lævi et lineâ obliquâ parùm

curvatâ e lateribus separato lineâque alterâ abbreviatâ utrinque versus angulos posticos.—Long. corp. lin. $5\frac{3}{4}$.

Hab. in Insulâ Hayti, Indiæ occidentalis. DD. Tweedy et Hearne. In Muss. Soc. Ent. Londin. et Hope.

February 15.

The Lord Bishop of Norwich, President, in the Chair.

Charles Cogswill, Esq., M.D., was elected a Fellow.

Read a memoir "On the early stages of the Development of *Lemanea fluviatilis*, Agardh." By G. H. K. Thwaites, Esq. Communicated by the Rev. M. J. Berkeley, F.L.S.

Mr. Thwaites attributes the neglect of the early condition of this conferva to its having been confounded in this stage with *Trentepohlia pulchella* β . *chalybea*, Harv., with which it is frequently found growing intermingled. He states that it may be observed in great abundance towards the end of November, covering the surface of stones with a uniform, dark olive, somewhat villous coating, and adhering with great pertinacity by means of its minute roots. The structure of the plant at this early stage is found to consist of numerous conferva-like filaments, of about a line in length and sparingly branched. Each filament is about $\frac{1}{1100}$ th of an inch in diameter, and consists of a single row of cells, which are from 4 to 6 times longer than wide, and have a blue-green endochrome arranged in a spiral manner, except in the terminal cells, where it is more abundant and gives them a darker colour. This stage Mr. Thwaites regards as analogous to the confervoid filaments which form the primordia of a moss, or to the mycelium of a fungus; and he adds that Kützing has described and figured the early condition of *Lemanea torulosa*, Agardh, as very similar.

From a cell near the base of this conferva-like structure a branch is given off, which at first differs apparently from the ordinary branches only in its cells being much shorter. This little branch increases rapidly in length and thickness from the multiplication of its cells by fissiparous division; and to enable it to acquire a firmer support, a number of roots are given off from its base (in the same manner as in the *phyton* of a moss), and it is thus enabled to attach itself and maintain an independent existence. From this period it gra-

dually puts on the well-known characters of the full-grown *Le-manea*.

Mr. Thwaites believes that the study of the early development of the *Algæ* would well repay the careful observer. He thinks it highly probable that very many of the structures now classed with the *Palmelle* are merely immature states of more complicated species; but he recommends great caution in such investigations, as without a good microscope and a practised eye, very essential characters readily escape detection.

Read also a portion of Dr. Buchanan Hamilton's Commentary on the 9th Part of Van Rheede's *Hortus Malabaricus*.

March 7.

The Lord Bishop of Norwich, President, in the Chair.

Joseph Dorrington, Esq., M.A., was elected a Fellow.

Read a memoir "On *Melianthea*, a new natural order of plants, proposed and defined by J. E. Planchon, docteur-ès-sciences." Communicated by the Secretary.

After an introductory critical sketch, the author proceeds to compare together *Melanthus*, *Diplerisma* (a new genus founded upon *Melanthus minor*, L., and *Mel. comosus*, Vahl), *Natalia* and *Bersama*; that is to say, the four genera which he proposes to unite under the common name of *Melianthea*. This comparison includes chiefly descriptive details, of the results of which the following synoptical table will afford a summary view:—(See the Table on pp. 362-3.)

A glance at the characters suffices to show that those among them which are common to all the genera are also of undoubted primary importance in most natural tribes. So, for instance, the structure of the seeds, the relative position and numerical proportion of the floral parts, the position and even the shape of the disc, the pinnate leaves and the constant presence of stipules, are so many points by which the connection of these plants is established. Admitting then the homogeneity of the order, the author proceeds to point out its more general affinities.

| Ord. MELIANTHEÆ, <i>Planch.</i> | | |
|---------------------------------|---|---|
| Sect. 1. EUMELIANTHEÆ. | | Sect. 2. BERSAMEÆ. |
| Genus 1. MELIANTHUS, <i>L.</i> | Genus 2. DIPLERISMA, <i>Planch.</i> | Genus 3. NATALIA, <i>Hochst.</i> |
| Vegetation ... | Shrubs, half herbaceous | Small trees |
| Facies | Like <i>Rosaceæ</i> — <i>Agrimonia</i> Glaucous, glabrous | One species like <i>Paullinia pin-</i> <i>nata</i> . |
| Leaves | Alternate, imparipinnate | Alternate, imparipinnate. |
| Stipules | One large intrapetiolar (made up of two). | One small intrapetiolar (made up of two). |
| Inflorescence | Racemes simple | Racemes simple. |
| Bractæe | Large | Small |
| Flowers | Respinate, in consequence of the early torsion of the pedicels. | At all times in their right po- sition. |
| Calyx | Asymmetrical Larger than the corolla, remark- ably irregular. | Symmetrical. Smaller than the corolla, slightly irregular. |
| Calyx seg- ments. | With a short and sometimes ob- solete spur. | Without spur. |
| Petals | 5 One superior small, two lateral narrow, two inferior wide, large, all equally free. | 5. Hardly unequal; one superior, two lateral, two inferior, which last are connected into one. |
| | 5 Ungulate, alternate with the calycine segments. Lower one abortive | 5. Ungulate, alternate with the calycine segments. Lower one a little smaller. |
| | Lateral and posterior ones con- verging and connected by the woolly margins of their claws. | All free. |

| | | | |
|---------------|--|---|--|
| Disc | the posterior side of the flower, between the petals and stamens. | the posterior side of the flower, between the petals and stamens. | the posterior side of the flower, between the petals and stamens. |
| Stamens | Hippocrepiform 4, slightly didynamous Alternate with the petals The bases of the two posterior slightly connected, the inferior wanting. | Hippocrepiform 4, slightly didynamous Alternate with the petals The bases of the two posterior slightly connected, the inferior wanting. | Hippocrepiform 4, slightly didynamous Alternate with the petals The bases of the two posterior slightly connected, the inferior wanting. |
| Anthers | Introrse, bilocular, opening by two vertical clefts, attached on the back, a little above their base. | Introrse, bilocular, opening by two vertical clefts, attached on the back, a little above their base. | Introrse, bilocular, opening by two vertical clefts, attached on the back, a little above their base. |
| Ovarium | 4-celled (cells alternate with the stamens). Subulate, bent backwards 4-toothed 4 (anatropous) in each cell Attached above the middle of the internal angle. | 4-celled (cells alternate with the stamens). Subulate, bent backwards (thick) 4-lobed 1 (anatropous) in each cell Attached at the base of the internal angle. | 5-celled (cells alternate with the stamens). Subulate, bent backwards (thick). 5 lobed. 1 (anatropous) in each cell. Attached at the base of the internal angle. |
| Style | Horizontal or ascending | Ascending | Ascending. |
| Stigma | Follicular capsule almost tetra-pterous. | Follicular capsule almost tetra-pterous. | Coriaceous, subglobose capsule. |
| Ovules | 4-lobed at its apex | Equal and not lobed at both ends. | Not lobed. |
| Fruit | With a loculicidal dehiscence | With a loculicidal dehiscence | With a loculicidal dehiscence. |
| | 2 in each cell | 2 or 4 | Solitary. |
| | Not arillate | Not arillate | With a fleshy cupular arillus. |
| | Crustaceous | Crustaceous | Crustaceous. |
| | Copious, almost horny | Copious, almost horny | Copious, almost horny. |
| | Straight in the axis of the albumen, with a clavate radicle longer than the plano-convex cotyledons. | Straight in the axis of the albumen, with a clavate radicle longer than the plano-convex cotyledons. | Straight in the axis of the albumen, with a clavate radicle longer than the plano-convex cotyledons. |

Melianthus being usually considered as an anomalous form of *Zygophylleæ*, the question presents itself, to what natural class this last order is to be referred? Is it also to be admitted simply as a tribe of *Rutaceæ* (as defined by the Jussieus), or shall we follow Mr. Robert Brown in considering it as an independent order? The author not only declares in favour of the latter opinion, but expresses his belief that while, on the one hand, *Diosmeæ* (including *Ruteæ*, *Diosmeæ* proper, *Zanthoxyleæ* and *Aurantiaceæ*), together with *Simarubeæ* and *Meliaceæ*, constitute a natural class, so, on the other hand, *Zygophylleæ*, *Oxalideæ*, *Connaraceæ*, *Leguminosæ* and *Moringeæ* are closely connected into one group, not only by their general structure and *facies*, but by the common tendency of their compound leaves to periodical sleep, or occasionally to movement under an irritating influence, a physiological phænomenon connected with the structural fact of the articulation of the foliole with the petiole on which it moves.

Neither of the two natural classes just mentioned admits, in the opinion of the author, the new order of *Meliantheæ*.

The pinnate leaves, irregular flowers, excentric and incomplete disc placed outside of the stamens, the quaternary proportion* of these organs in contrast with the quinary division of the calyx, the occasional cohesion of two of the sepals, the close analogy of the follicular capsule of *Diplerisma* with that of *Cardiospermum*, and of the coriaceous fruit and arillate seeds of *Bersameæ* with the corresponding parts in *Paullinia*, and the fact of a species of *Natalia* being justly named *Paullinioides*, are the points by which the close affinity of *Meliantheæ* with *Sapindaceæ* are traced out. Thus by the knowledge of very recent materials (*Bersama* and *Natalia* being both but lately discovered) are confirmed the views which Adanson expressed upon the affinities of *Melianthus*, when, in his otherwise rather heterogeneous family of *Gerania*, he placed that singular genus between *Cardiospermum* and *Geranium*.

After some other general considerations, the author concludes with a review of the geographical distribution of *Meliantheæ*, the most striking fact mentioned being the occurrence of *Melianthus Himalayanus*, Wall., in the mountains of northern India, while its only congener, the well-known *Melianthus major*, L., does not exceed the limits of the flora of the Cape of Good Hope.

* *Bersama* must here be excepted, because of its five stamens.

March 21.

E. Forster, Esq., V.P., in the Chair.

Read a Memoir "On the Australian species of the Coleopterous genus *Bolboceras*, Kirby." By J. O. Westwood, Esq., F.L.S. &c.

In this paper, which contains the characters and descriptions of five new species of *Bolboceras* from Australia, Mr. Westwood passes in review the various writers on the subject, and enters into some critical detail on the characters which they have assigned to the genus. The following are the characters of the new species proposed:—

1. *B. (ELEPHASTOMUS) KIRBII*; castaneo-fulvus, capitis cornu antice porrecto brevi truncato plano subtus in spicam bifidam haud producto, vertice carinâ brevi transversâ, prothoracis lateribus valdè punctatis utrinque fossulatis; disco posticè canali abbreviato longitudinali instructo.—Long. corp. lin. 9.

B. (Elephastomus) Kirbii, Hope MSS.

Hab. in Terrâ Van Diemen. In Mus. Hope.

This appears to be the insect given by Mr. MacLeay as the female of *Elephastomus proboscideus*. It is however a male, and is given by Dr. Klug as a variety of the male of that species. The insect above described appears sufficiently distinct as a species from the former.

2. *B. REICHII*; castaneus nitidus, capite cornu valdè elongato erecto, prothorace anticè valdè deflexo et subconavo cornubus duobus crassis longitudine capitis porrectis lateralibus armato: singulo versus basin dente obtuso erecto instructo; prothoracis lateribus rudè punctatis spatioque triangulari impresso et punctato ante scutellum; margine postico parùm elevato, elytris striis gracillimis punctatis, tibiis anticis extus 5-dentatis. ♂.—Long. corp. lin. 11; lat. prothoracis lin. 7.

Hab. Port Essington. In Mus. Hope et Reich.

♂ *Bolboceras Reichii*, Guérin, Voyage de la Favorite, et Iconogr. du Règne An. Ins. p. 84.

Bolboceras Kirbii ♂, Hope in Proc. of Ent. Soc., Nov. 1841, p. 43.

♀ *Bolboceras Kirbii*, Bainbridge in Trans. Ent. Soc.

Differt capite minori, vertice in tuberculum conicum apice bifidum elevato, clypeo et vertice carinâ tenui angulatâ separatis, pronoto anticè spatio subhexagono plano polito, in puncta duo profunda anticè lateraliter desinente; disco pone medium valdè punctato, versus marginem posticum elevato lævi, spatio ovali mediano punctato et impresso relicto.—Long. corp. lin. 11.

Hab. ad Melville Island. Mus. Hope (etiam in Mus. Gory, nunc Hope cum nomine *B. Reichii* inscripto).

NO. XXXV.—PROCEEDINGS OF THE LINNEAN SOCIETY.

Obs. The name given to the male of this species is here retained in preference to that of the female, in accordance with the usual custom in such cases.

3. *B. TAURUS*; castaneus nitidus, capitis vertice utrinque laminis duabus auriculatis erectis instructo cornubusque duobus elongatis curvatis nigris ante oculos armato, pronoto in medio versus marginem anticum parum reflexo seu tuberculis duobus transversis subelevatis instructo; lateribus punctatis.—Long. corp. lin. 8.

Hab. ad Swan River. In Mus. Hope (olim Gory, sub nomine manuscripto suprâ indicato; etiam in Mus. Saunders).

4. *B. CAPREOLUS*; castaneus nitidus, capite posticè nigricante; vertice cornu lato furcato 6-dentato erecto armato, pronoto anticè retuso glabro, dorso carinâ transversâ pone medium instructo, mandibulis magnis extus denticulatis. ♂.—Long. corp. lin. 9.

Hab. in Novâ Hollandiâ, Swan River. In Mus. Hope (olim Mus. Gory, cum nomine suprâ inscripto designatum).

5. *B. BAINBRIDGII*; piceus, capitis clypeo anticè tridentato, dente intermedio minori; vertice inermi, pronoto anticè valdè declivi dente erecto versus marginem anticum; parte declivi suprâ carinâ curvatâ marginatâ.—Long. corp. lin. 7.

Hab. in Novâ Hollandiâ, Swan River. In Mus. D. Hope.

Of these species, as well as of *B. (Elephastomus) Australasiæ*, Kirby, *B. serricollis*, Bainbridge, *B. hastifer*, Bainb., *B. 3-tuberculatus*, Bainb., *B. 7-tuberculatus*, Bainb., *B. coronatus*, Klug, *B. quadricornis*, Klug, *B. neglectus*, Hope, *B. rotundatus*, Hope, and *B. rubescens*, Hope, Mr. Westwood adds figures, either of the whole insect or of the more distinctive parts. He also figures and describes a new subgenus with the following characters:—

Subgenus STENASPIDIUS.

Corpus magis elongatum quam in *Bolboceratis veris*; scutello elongato (nec triangulari); elytris striis 5 tantum inter humeros et suturam; mesosterno porrecto. Differt etiam colore antennarum.

BOLBOCERAS (STENASPIDIUS) NIGRICORNIS; ovalis niger nitidus sparsim punctatus, capite tuberculo conico inter oculos, pronoto canali punctato medio aliisque duobus abbreviatis pone oculos, elytris striato-punctatis.
—Long. corp. lin. $3\frac{1}{2}$.

Hab. in Novâ Hollandiâ. In Mus. D. Hope (olim Gory, cum nomine suprâ indicato inscripto).

April 4.

E. Forster, Esq., V.P., in the Chair.

Thomas Worthington Barlow, Esq., was elected a Fellow.

Read some "Notes on the Vegetation of Scinde," extracted from a Letter addressed by John Ellerton Stocks, Esq., M.D., to J. F. Royle, Esq., M.D., F.R.S., F.L.S. &c., dated Bombay, November 25, 1847.

The extracts consisted, first, of a sketch of the physical geography, soil and climate of the neighbourhood of Kurrachee, of the road from Kurrachee to Hydrabad, and of that between Hydrabad and Roree; secondly, of lists of the more remarkable plants arranged according to the stations in which they were found; thirdly, of comparative estimates of the prevalent proportions of the principal Natural Orders as compared with the Flora of India generally; fourthly, of lists of the characteristic plants of Scinde, and of those which predominate in the number of individuals to such an extent as to give a peculiar character to the face of the country; and lastly, of an indication of those species by which the Flora of Scinde is connected severally with those of Cabool, of Arabia, of Egypt, and of the Punjaub and Delhi.

In a postscript to his letter, which was accompanied by a packet of specimens, Dr. Stocks refers to Captain Vicary's paper on the Plants of Scinde, in the Journal of the Asiatic Society of Calcutta for November 1847, which he had received subsequently to writing the letter, and to his own remarks printed by Sir William J. Hooker, from a letter addressed to him in the Supplement to the Botanical Magazine for September. He desires that Captain Vicary's published names of various species may be substituted for his own MS. names; and remarks that Captain Vicary's *Ægialitis* is a true *Statice*; his *Breweria evolvuloides* is *Seddera latifolia*, Hochst. and Steud.; his *Calligonum polygonoides* is certainly a new genus, for which Dr. Stocks had in his MSS. proposed the name of *Gibsonia*; his *Morisonia Asiatica* is *M. Lawiana*, Stocks, in Calcutta Journal, 1846; his *Zygophyllum obtusum* is *Z. simplex*, L.; his *Corchorus depressus* is *C. humilis*, Munro; his frutescent *Crambe* is a species of *Didesmus*, *D. panduriformis*, Stocks; and his *Cadaba Indica* is a fine *Capparis*, probably new, and found also in Arabia. Dr. Stocks proposes the name of *Vicarya* for a new genus of *Malvaceæ* which he

purposes describing, along with *Gibsonia* and *Sericostoma*, a new genus of *Boragineæ*, in the next number of the Bombay Asiatic Journal.

April 18.

T. Horsfield, M.D., V.P., in the Chair.

Read a continuation of Mr. Newport's Third Memoir "On the Anatomy and Development of *Meloë*."

The author remarked that every normal change in structure depends on definite laws, and that when the proper operation of these is impeded, or when change is effected by violence, the function of structure is impaired.

After mentioning that Malpighi, in his anatomy of the Silk-worm, glanced at, and Dr. Willis, in this country, at the end of the seventeenth century, more particularly announced, the view that changes in structure in all animals are regulated by those general principles which have since been so admirably worked out by Geoffroy Saint-Hilaire, Mr. Newport stated that his object in the present memoir is to further exemplify these principles in the Anatomy of *Melöe*, and to endeavour to apply them to the explanation of function as dependent on structure.

Although the object of variations in structure cannot always be at once traced in the details, it is invariably evident in the general design of parts, and it is found to be so likewise in their peculiarities in proportion as we become more fully acquainted with the habits of animals, as is shown in the details of structure in the young *Melöe* and *Stylops* at particular periods of their growth. Changes in the structure of parts during growth in the young animal were shown to commence in the cells of the tegument, and that it is by means of these that the form of the body is gradually altered. These changes are not to be confounded with other *secondary* ones which give form to the adult animal, and which we are familiar with as the *metamorphoses*.

The dermal appendages, spines, hairs and scales, were shown to be similar in their mode of origin in the tegument to the appendages of segments, and their growth and removal to be regulated by the same principles. Mr. Newport showed that the appendages originate by an extension outwards of the whole of the layers of a portion of tegument, whilst spines, hairs and scales originate in the nuclei of

cells of separate layers. He stated also that he had detected these modes of origin in the embryo before it leaves the ovum, and combated the view of M. Lavalley that spines are originally an extension outwards of the whole of the dermal tissue, as they are often found to be in *Crustacea* at advanced periods of growth, showing that they only become so in them, and in the larvæ of other *Articulata*, during their growth and enlargement, by involving contiguous portions of the tissue. These views were illustrated by examination of the tegument of *Melœ*, and by reference to the changes in the tegument of *Lepidoptera* at the period of transformation.

The author then passed to a consideration of the *secondary* causes of development—the *metamorphoses*—and pointed out, from an examination of the cast skin of the larva of *Melœ*, which always remains attached to the body of the inactive full-grown larva in its cell, what are its previous habits and form, drawing attention to the fact, that the cast skin of an insect, when relaxed and unfolded, enables the anatomist of the *Invertebrata* to indicate the form and general habits of a species as precisely as the fossil bone enables the comparative anatomist of the *Vertebrata* to indicate those of the inhabitant of a former world.

The changes which *Melœ* undergoes were then described; and the mode of formation of the head in the *Articulata* explained as composed of a definite number of originally distinct segments. Mr. Newport referred to his former discovery of these segments in the embryo of *Geophilus*, and stated, in answer to the recent denial of some parts of his views by Professor Erichson, regarding the organs of manducation in *Myriapoda*, that he has satisfied himself of their correctness, having not only confirmed them in that class, but also in the embryos of other *Articulata*. These views he then applied to illustrate the anatomy of the head and organs of manducation in *Melœ*, showing the mode in which the changes in the structure of the mandibles are effected, and pointing out corresponding changes in the function of the parts; noticing also that change in structure during the growth of an animal usually precedes change in the function of an organ,—a circumstance which leads to the inference that function is closely dependent on special structure.

The secondary changes during the development of *Articulata*, the *metamorphoses*, are effected, not by the tegument itself, but by the agency of structures connected with the tegument—the muscles. The author stated that we are entirely ignorant of the secret cause which first excites the muscles, at a definite period of growth, into action in effecting these changes; but suggested that it is in the expansive

and contractile forms of growth in the tissues themselves. All that is known with certainty is, that it is through the direct agency of the muscles that the form of body of the insect is rapidly altered at the period of the metamorphoses, and that the operation of these is accelerated or retarded by physical influences. The mode in which the muscles operate in effecting the changes was then pointed out, and the altered proportions of different parts of the body after the change was shown to depend on the greater or less extent to which the contraction of the muscles of different segments is carried.

The result of these altered proportions in the tegument of an insect that is changing to the form of pupa or nymph, as in *Melœ*, is a rapid re-induction of the forces of growth in the appendages, the future wings and legs, which become greatly elongated, at and immediately after the change. These alterations of form are accompanied as a last result by changes in the intimate structure of the tegument, a consolidation of a large portion of it, and the formation of the dermo-skeleton of the imago.

May 2.

The Lord Bishop of Norwich, President, in the Chair.

M. J. Decaisne was elected a Foreign Member, and John Fraser, Esq., an Associate.

The Society passed a Resolution expressive of its deep regret at receiving, at the moment when about to ballot on the Certificate of Prof. J. G. Zuccarini as a Foreign Member, the intelligence of his lamented death.

Read a memoir "On the Anatomy and affinities of *Pteronarcys regalis*, Newm." By George Newport, Esq., F.R.S., F.L.S. &c. &c.

Mr. Newport commenced by stating that the existence of a winged insect with branchial organs for respiration is so anomalous a condition of life, that himself as well as others at first regarded the specimen he had obtained rather as an accidental instance of incomplete development than a normal condition. He found however, on comparing his specimen, preserved in spirit, with other dried specimens in the cabinets of the British Museum, that this was not the case, as evidences of branchiæ are to be found in the whole of the dried specimens of the genus in that collection.

Having waited some years since obtaining this specimen, in hopes

of receiving others for the purpose of dissection, the author has now made a careful examination of the insect. He described the forms of branchiæ in different genera of *Neuroptera*, and pointed out that the peculiarity of *Pteronarcys* consists in its possessing in its winged state, both branchiæ for aquatic respiration and spiracles for the direct respiration of air.

He then described the branchiæ, their connexion with the respiratory organs, and the mode in which the blood circulates through them, as he has seen in a neighbouring family, *Sialis*, and reviewed what is yet known of the habits of the insect in connexion with these remarkable structures.

The author regards *Pteronarcys*, from the circumstance of its possessing in its winged state the means of both aquatic and aërial respiration, as an *Insect Proteus*, the representative of the *Proteus* of *Vertebrata*, both in structure and habits.

The anatomy of some parts of the dermo-skeleton, of the spiracles, and of the distribution of its internal respiratory organs, as compared with that of neighbouring genera, is then described, as well as of the digestive organs, and nervous and reproductive system. These are minutely examined and the structures delineated on an accompanying plate.

Anniversary Meeting.

May 24.

The Lord Bishop of Norwich, President, in the Chair.

This day, the Anniversary of the birth of Linnæus, and that appointed by the Charter for the election of Council and Officers, the President opened the business of the Meeting, and stated the number of Members whom the Society had lost during the past year; and the Secretary read the following notices of those Fellows with whose decease the Society had become acquainted since the last Anniversary.

Mr. Arthur Biggs was for some time gardener to Isaac Swainson, Esq., and afterwards Curator of the Cambridge Botanic Garden. He was elected an Associate of the Linnean Society in 1815, soon after his appointment to the latter office; and in December of the same year he became a Fellow of the Society. While in the service of

Mr. Swanson he contributed to the first volume of the 'Transactions of the Horticultural Society,' a paper entitled "An Account of some new Apples which, with many others that have been cultivated, were exhibited before the Horticultural Society on the 2nd of December last [1806]." He died in the early part of the present year.

John Dunston, Esq., of Castle House, Sidbury, near Honiton, Devon, became a Fellow of the Society in 1818, and died on the 11th of August 1847, at the age of 68.

John Ellis, Esq., became a Fellow of the Society in 1797, and of the Royal Society in 1801.

William Finch, Esq., M.D., of Bellevue, near Salisbury, became a Fellow of the Society in 1837, and died on the 7th of January 1848.

George Townshend Fox, Esq., was a gentleman of property in the county of Durham, and warmly attached to the study of natural history, and especially of British ornithology. He published in 1827 a "Synopsis of the Newcastle Museum, late the Allan, formerly the Tunstall, or Wycliffe Museum: to which are prefixed Memoirs of Mr. Tunstall, the Founder, and of Mr. Allan, the late Proprietor, of the Collection, with occasional Remarks on the Species, by those Gentlemen and the Editor," Newcastle, 8vo. This volume is chiefly remarkable, in a natural-history point of view, for the notes on the capture of the rarer species of British birds, and on the distinctions of the more doubtful, which evince considerable research and knowledge of the subject. Mr. Fox was himself a large contributor to the museum he described, and in which he continued to take great interest up to the time of his death, in April of the present year. He became a Fellow of the Linnean Society in 1825.

The Rev. John Hailstone, M.A., F.R.S., F.G.S. &c., was born in the neighbourhood of London, in the year 1759, and at a very early age was placed under the care of a maternal uncle at York, and afterwards sent to Beverley School in the East Riding of that county. At the usual period he was entered at Catherine Hall, in the University of Cambridge; his talents, however, attracted the notice of his friends, and he removed by their advice to a larger place of competition and honour, Trinity College, where he took his degree of B.A. in 1782, and was the second Wrangler of his year, in company with Dr. Wood the late Master of St. John (who was Senior Wrangler), Dr. Raine (late Master of the Charter House), Professor Porson and many other distinguished men. He was soon afterwards elected Fellow of his College, and in 1788 became Woodwardian Professor of Geology in the University, which office he held until 1818, when he relinquished it and his Fellowship, upon

his marriage, and took the living of Trumpington, in the gift of the College, where he resided until his death.

His course during nearly forty years' residence within the walls of Trinity College was marked as well by eminence in the scientific world, as by unwearied exertions to raise the College to high repute and usefulness as a place of sound learning and religious education. The science of geology was at that time in its infancy, and Professor Hailstone was among the foremost in placing its grand deductions upon that satisfactory basis which is received and recognized by geologists at the present day. His labours in collecting facts and specimens during the various journeys which he took for the purpose through the British Isles, as well as on the continent of Europe, are abundantly testified by the important and extensive additions which he made to the Woodwardian Museum. His zeal also, exercised among many influential friends of the University, contributed to excite an interest in the improvement of the collection, which has since made such rapid progress under the very able auspices of his successor Professor Sedgwick.

He became a Fellow of this Society in 1800, of the Royal Society in 1801, and a Member of the Geological Society on its first formation. Although geology was his favourite pursuit, he was not unacquainted with other branches of science, such as the kindred ones of chemistry and mineralogy, and other departments of natural history, and has left behind him a daily register of Meteorological Phenomena which he kept for a great number of years. He was the intimate friend of Drs. Wollaston, Clarke, and many other scientific men, in communication with them, and enjoyed their correspondence.

His modest and unobtrusive character found a genial sphere in the quiet duties of a parish priest: the last twenty-five years of his long and useful life were spent in doing good among those who resided around him at Trumpington; the rich valued his calm and sound judgement, and the poor looked up to him with reverence and affection for the continual interest he took in their welfare, and for his liberality and benevolence towards them. The parochial schools and residence for a master, mainly erected at his own expense, and most liberally endowed by his will, stand in his village a substantial and fitting memorial of his high and amiable character. He died at Trumpington, June 9, 1847, after a short illness, in the 88th year of his age.

Edward Holme, Esq., M.D., was one of those "who are mentioned with reverence rather for the possession than the exertion of uncommon abilities." Whether from a severely fastidious taste,

which he was unable to satisfy, from painfully laborious habits of composition, or from his mental tendencies impelling him rather to accumulate knowledge than to extend its boundaries, he has left to the world no measure of his intellectual stature. His only printed essay, besides his Inaugural Thesis, is a brief note on the correct reading of a partly effaced Roman inscription. It was in social intercourse, and in animated discussions, that his extensive knowledge and remarkable mental powers were exclusively manifested; and, as far as it may be safe to judge from such unwritten demonstrations of great talents, he would appear to have been one, who in the impressive words of Playfair "might have enjoyed more of the fame, had he been less satisfied with the possession, of knowledge."

Dr. Holme was born February 17, 1770, at Kendal in Lancashire. No notices have been preserved of his early studies; but in January 1787 he was admitted a student in the Academy that had been recently established in Manchester. From thence he was removed in the summer of 1790 to the University of Göttingen, where he laid the foundations of his vast and accurate scholarship, and where he enjoyed the inestimable privilege of sitting at the feet of Heyne. He passed the winters of 1791-2 and 1792-3 in attending the Medical Classes and the Chemical Lectures of Dr. Blake in Edinburgh. In December 1793 he received the degree of M.D. from the University of Leyden. His Thesis 'De Structurâ et Usu Vasorum Absorbentium' is a faithful and masterly exposition of what was then known of the anatomical structure and functions of that system of vessels. In April 1794 he was elected one of the Physicians to the Manchester Infirmary, an appointment which he held till the year 1828. He also became in 1794 a member of the Literary and Philosophical Society of Manchester, and filled in succession all its offices of honour, having been raised to the Presidency in 1844 on the death of Dalton. During this long period he communicated numerous papers, all of which he withheld from publication. One of them, "On the History of Sculpture from the earliest period to the time of Phidias," was found among his MSS., and is now about to be published in the forthcoming volume of the Manchester Memoirs.

Beyond the pale of his profession his pursuits were chiefly literary. His exact and critical knowledge of the ancient languages, and his familiarity with the writings of the leading scholars and philologists from the revival of letters to the time of Bentley, had secured for him the warm friendship and respect of Parr. He was profoundly read in history, and especially conversant with local

antiquities, genealogy and heraldry, particularly those of the counties of Lancaster and Chester.

In science his tastes had early directed him to the sciences of classification, and with marked predilection to botany, entomology, and ornithology. He became a Fellow of the Linnean Society in 1799; and was one of the founders and the first President of the Natural History Society of Manchester. He was zealously active in enriching the museum of the latter Society with rare specimens, and in promoting the erection of suitable apartments for their preservation and display. His library was adorned with the most costly illustrated works in natural history. Indeed his dominant passion, the love of books, might be traced in his infinitely greater familiarity with the literature of the natural sciences than with actual objects and specimens. Among the essays which he read before the Philosophical Society of Manchester were some on questions of natural history, as

1797. On the Colour of Negroes, with illustrations of the Law of Habit.

1798. On the Distribution and Physiology of the Nerves of the Heart.

1801. An Entomological Fragment.

1803. On the Existence of the Unicorn.

None of these have been discovered in his repositories. He declined permitting any of them to appear in the Manchester Memoirs, rather destining them to furnish the subject of an evening's discussion, than regarding them as valuable additions to the then state of knowledge. His attainments in zoology are pronounced by good judges to have been accurate and comprehensive; but it does not appear that there was any special province which he had cultivated with strong preference and prominent success. Nature had endowed him with a memory no less remarkable for the tenaciousness of its grasp than for the readiness of its responses, when invoked. What he had once read or heard remained with him through life, as if engraven on tablets of brass or marble. This faculty rendered him distinguished service in the studies of natural history; but there is nothing to show that his power of observation was at all of commensurate vigour or activity. It is impossible to claim for him rank as an original cultivator of any branch of natural history. Perhaps the full occupation of his time in the engrossing exercise of his profession might be pleaded as a valid apology. But from tracing the same indisposition to original mental efforts, at least in the form of permanent written fruits, throughout his entire intellectual career, pro-

fessional, literary and scientific, his able biographer Dr. William Charles Henry is inclined to refer it to inherent mental qualities. He died in November 1847, and bequeathed the residue of his property, amounting to £25,000, to the Medical Department of University College, London.

James Kendrick, Esq., M.D., of Warrington, for many years Senior Physician to the Dispensary and Infirmary of that town, where he had established an extensive practice, became a Fellow of the Linnean Society in 1802, and died in the spring of the present year.

He published in 1832 a little pamphlet entitled "Cursory Remarks on the present Epidemic [Cholera]."

William Oliver Locke, Esq., M.D., of Norwich, was elected F.L.S. in 1824, and died in the month of February 1846.

John Morgan, Esq., was born at Stamford Hill, on the 20th of January 1797. His father, William Morgan, was the late well-known and distinguished Actuary of the Equitable Assurance Office, an institution which owed its unprecedented success in great measure to his talents and firmness. Having received his general education at home, Mr. Morgan commenced his professional studies as an articled pupil of the late Sir Astley Cooper. He became a Member of the Royal College of Surgeons in 1819, and in 1824, at the early age of 27, he was elected Surgeon to Guy's Hospital, at the school of which institution he filled the Chair of Surgery for many years; and to his influence is mainly due the establishment of the Eye Infirmary in connexion with the Hospital. He was also a Member of the Council of the Royal College of Surgeons, which appointment he received in 1843.

Of his reputation as a Hospital Surgeon, as an Operator, and as a Surgical Physician, if the term may be allowed, it is not necessary on this occasion to speak at large. The voice of the profession has however established his character as among the highest in all these departments of professional practice. It is more to our present purpose to refer to his scientific attainments and tastes, and particularly to his pursuit of zoology and comparative anatomy. His knowledge of British ornithology was accurate and extensive; and he formed one of the most complete and beautiful collections of British birds in existence, which is now in the museum of the Cambridge Philosophical Society. He devoted at one period much of his attention to the subject of comparative anatomy, and the volumes of the 'Linnean Transactions' contain some papers on this department of science, which show the acumen with which he always seized

on important facts, and the clearness with which he elucidated their bearing upon the functions to which they appertained. His description of the mammary organs of the Kangaroo, and that of the structure of the pharynx in the Capybara, both contained in the 16th vol. of our 'Transactions,' may be regarded as models of monographs of single organs.

The most striking characteristic of Mr. Morgan's mind was simple truthfulness. There scarcely lived a man more utterly free from all guile, or of more childlike simplicity. His whole heart was open as the day to those whom he loved, and as close and dark as midnight to those whom he held at a distance. This arose not from any misanthropic feeling on his part, but rather was the natural result of the intensity and concentration of his affections. Of his benevolence the world knew but little in comparison with its actual extent. The same character distinguished his scientific pursuits. As he would have scorned to assume to himself the credit due to another, so he insisted on retaining the credit which belonged to himself, and this too from the same truthfulness which marked all his conduct. His conversation was delightful when alone with those "few familiar friends" with whom he had no reserve, but an habitual reserve arising from natural and educational timidity prevented him from *opening* to the multitude, and hence he was not generally appreciated.

To use the words of one who knew him well, "In public life admired and respected, in private beloved, Mr. Morgan sank beneath a gradual and almost painless malady, the surely fatal termination of which it was his melancholy advantage from the first to foresee." He died on the 4th of October last, in the 51st year of his age. His election as a Fellow of the Linnean Society dates from 1826.

William Peete, Esq., one of our oldest Fellows, having been elected into the Society in 1794, was born on the 27th of June 1771, obtained his diploma in surgery in 1799, and became resident in or about the year 1795 at Dartford in Kent, where he entered into partnership with Mr., afterwards Dr. John Latham, the distinguished ornithologist. When Dr. Latham quitted Dartford in 1796 Mr. Peete succeeded to his practice, and in the year 1833, after having lived at Dartford for about eight-and-thirty years, he retired to Keston and subsequently to Bromley, in the same county, where he died on the 4th of February in the present year, in the 77th year of his age. Mr. Peete was well acquainted with British plants, to the study of which he particularly attached himself, especially of the rarer species of the neighbourhood in which he lived, and his opinion on all questions regarding them was deservedly treated with great respect.

Edwin John Quekett, Esq., was born at Langport in the county of Somerset in September 1808. He received his elementary education as a Surgeon in that town, and in 1828 commenced his attendance on the Medical Classes at University College, London, where he gained several honorary distinctions. He subsequently entered into practice in Welleclose Square, and became Surgeon to the Tower Hamlets Dispensary. In 1835 he became Lecturer on Botany in the Medical School of the London Hospital, and in the following year was elected into the Linnean Society. He took an active part in the formation of the Microscopical Society, which was founded in 1840, and contributed the first paper to its 'Transactions.' In 1843 he became joint-editor with Dr. Goodfellow of the 'London Physiological Journal,' a monthly periodical devoted especially to microscopical investigations, but of which five numbers only were published. Mr. Quekett had the reputation of a well-informed and sound practitioner, and was greatly esteemed for his kindness of disposition and indefatigable attention to his patients. He died on the 28th of last June, of a singularly anomalous and distressing complaint, first affecting the pharynx and subsequently the lungs, and for a long time rendering deglutition impossible.

As a microscopical observer Mr. Quekett is deserving of great credit. A skilful manipulator and possessed of considerable tact in the preparation of his subjects, he combined much mechanical ingenuity with an accurate theoretical as well as practical knowledge of the capabilities of his instrument; and his observations were consequently entitled to a high degree of confidence. The more important of his contributions to science are contained in our 'Transactions,' in those of the Microscopical Society and in the 'Physiological Journal.' A few also appeared in the 'London Medical Gazette,' and in the 'Pharmaceutical Journal.'

The following are the titles of Mr. Quekett's papers in the 'Transactions' of the Linnean and Microscopical Societies:—

"Observations on the Ergot of Rye, and some other Grasses," Linn. Trans. xviii. p. 453.

"Some further Observations on the Nature of the Ergot of Grasses," *ibid.* xix. p. 137.

"On the Development of the Vascular Tissue of Plants," Trans. Micr. Soc. i. p. 1.

"On the Structure of some Tissues possessing hygrometric properties," *ibid.* p. 23.

"On the Nature of Vessels possessing longitudinal as well as spiral fibres, found in certain Plants," *ibid.* p. 157.

"On an instance of Monstrosity in a Moss," *ibid.* p. 160.

“On the Structure of the Ligament connecting the Valves of Conchiferous Mollusks,” Linn. Trans. ii. p. 1.

“Remarks relating to the examination of Guano by the Microscope,” *ibid.* p. 29.

George Roddam, Esq., M.D., a naval physician of much skill and eminence, was attached to natural history, and made collections in several of its departments, especially entomology. He entered the Navy in 1797 as Surgeon of H.M.S. Thorn, on the Leeward Island Station, and continued to serve in various ships of war until 1812, when he was appointed Surgeon of the Royal Charlotte yacht. From this time his services were confined to the Royal yachts, and he finally retired from active service in 1831. He was elected a Fellow of the Linnean Society in 1813, and died on the 11th of October 1838.

Thomas Taylor, Esq., M.D., the coadjutor of Sir W. J. Hooker in the 1st and 2nd editions of ‘*Muscologia Britannica*,’ was possessed of a moderate independent income, which obviated the necessity of his devoting himself to the practice of his profession, and was thus enabled to follow the bent of his inclination, and to make botany, and especially cryptogamic botany, the business of his life. He resided chiefly in the South of Ireland, and during the existence of the Royal Cork Scientific Institution, occupied the chair of Botany and Natural History in that establishment; but afterwards retired to Dunkerron, Kenmare, in the immediate neighbourhood of the lakes of Killarney, where the latter years of his life were passed in studious retirement. The *Musci*, *Hepaticæ* and *Lichenes* formed the principal subjects of his study. His intimate knowledge of the first was testified by his contributions to the ‘*Muscologia Britannica*,’ an important memoir on the *Marchantieæ*, published in the 17th volume of our ‘*Transactions*,’ evidences his profound acquaintance with the *Hepaticæ*; and several contributions to Sir W. J. Hooker’s various periodical publications, show that he had paid great attention to the very difficult family of *Lichens*. He also contributed largely to the Cryptogamic portion of Dr. J. D. Hooker’s ‘*Flora Antarctica*,’ of the *Hepaticæ* and *Lichenes* of which work a Synopsis was given in the 3rd volume of Hooker’s ‘*London Journal of Botany*,’ together with a Supplement to the *Hepaticæ* in vol. iv.

Dr. Taylor is described by those who were most familiarly acquainted with him, as possessing a mind well-stored in various branches of science and literature, while his gentle and amiable manner rendered him a great favourite with all who had the happiness of his acquaintance. He became a Fellow of the Linnean So-

ciety in 1814, and died at Dunkerron in the month of February of the present year.

The following are the titles of some of his papers which are not more particularly mentioned in the preceding sketch :—

“ On a new British *Jungermannia* (*J. microscopica*),” Hooker’s Journ. of Bot. iv. p. 97.

“ On six species of *Jungermannia* new to Britain,” Hooker’s Lond. Journ. of Bot. iv. p. 276.

“ The distinctive characters of some new species of *Musci*, collected by Professor William Jameson in the vicinity of Quito, and by Mr. James Drummond at Swan River,” *ibid.* v. p. 41.

“ New *Hepaticæ* (chiefly from Sir W. J. Hooker’s Herbarium),” *ibid.* v. pp. 258 and 365.

“ New Lichens, principally from the Herbarium of Sir W. J. Hooker,” *ibid.* vi. p. 148.

“ Descriptions of new *Musci* and *Hepaticæ*, collected by Professor William Jameson on Pichincha, near Quito,” *ibid.* vi. p. 328.

And Sir W. J. Hooker announces the publication of several others which will appear in the ‘ London Journal of Botany ’ as posthumous memoirs.

Richard Weekes, Esq., was educated to the medical profession, and was associated for some years with his father in an extensive and successful country practice at his native place, Hurst Pierpoint, in the county of Sussex, where he continued to reside till the time of his death. Soon after his father’s death he retired from practice. He inherited from his father a taste for natural history, as well as for antiquarian pursuits; and became a Fellow of the Linnean Society in 1806. He died on the 24th of December last, in the 64th year of his age.

Thomas Wheeler, Esq., was born in the city of London in the year 1754. He received his elementary education under Mr. Garrow, the father of the late Sir William Garrow, and was subsequently a scholar at St. Paul’s School. In the course of his medical studies, he attended the Anatomical Lectures of Mr. Hewson, and the Chemical and Medical Lectures of Dr. George Fordyce. From this distinguished man he received many marks of kindness during his attendance on the clinical practice of St. Thomas’s Hospital: nor did these cease except with the life of the teacher.

At an early period Mr. Wheeler exhibited a great fondness for the study of botany: this was much encouraged by his teacher William Hudson, author of the ‘ Flora Anglica,’ at that time the Professor of Botany to the Society of Apothecaries in London. When

this office became vacant by the resignation of William Curtis, author of the 'Flora Londinensis,' Mr. Wheeler became his successor, and continued to discharge its duties with great pleasure to himself and advantage to his pupils for the long period of forty years.

In the year 1800 he was elected to be the Apothecary of Christ's Hospital, and six years afterwards he received the same appointment at St. Bartholomew's Hospital, in which office he continued fourteen years. In manners and habits Mr. Wheeler was distinguished by childlike simplicity, and he was remarkable for not having partaken of fermented liquors for nearly eighty years. He died in August 1847, having entered upon his 94th year. His Fellowship of the Linnean Society dates from 1799.

Sir John Eardley Wilmot, Bart., was the grandson of Sir Eardley Wilmot, Chief Justice of the Common Pleas in the early part of the reign of George the Third. He was educated at Harrow, and was called to the Bar at Lincoln's Inn in 1801. He went the Midland Circuit for several years, but soon ceased to practise as a Barrister, and took up his residence at his seat in Warwickshire, in which county he became Chairman of the Quarter Sessions, and afterwards one of the Members for its Northern Division. In 1821 he was created a Baronet, and in 1843 he was appointed Lieutenant-governor of Van Diemen's Land, where he died on the 3rd of February 1847, in the 64th year of his age.

He was D.C.L., F.R.S., and F.S.A., and was twice married, first to the sister of Capt. Sir Edward Parry, R.N., and secondly to a daughter of Sir Robert Chester, Knt., Master of the Ceremonies, by both of whom he has left a numerous family.

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

At the election which subsequently took place, the Lord Bishop of Norwich was re-elected President; Edward Forster, Esq., Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out: viz. Beriah Botfield, Esq., F.R.S.; William John Broderip, Esq., F.R.S.; the Very Rev. William Buckland, D.D., Dean of Westminster; Arthur Henfrey, Esq.; and George Newport, Esq., F.R.S.

June 6.

E. Forster, Esq., V.P., in the Chair.

Arthur Edward Knox, Esq., M.A., was elected a Fellow.

Read a "Notice of some Peloria varieties of *Viola canina*, L." By Edward Forbes, Esq., F.R.S., F.L.S., Professor of Botany in King's College, London.

These monstrosities were collected by Prof. Forbes in the Isle of Portland in the month of April. The plants in which they occurred were infested by the parasitic fungus figured in Sowerby's 'English Fungi' under the name of *Granularia Viola*, and afforded not only many distortions of the foliaceous organs evidently due to the presence of the fungus, but also various monstrosities of the flower, of which the author gives a particular description illustrated by drawings.

These were found chiefly in the small variety of *Viola canina*, figured in the 'Supplement to English Botany' as *Viola flavicornis*. One of these plants had two two-spurred flowers exactly similar and deviating from the ordinary structure in the following particulars:— There were four sepals, all enlarged and diseased, the superior being smaller than the others, the two lateral equal but abnormally large, and the anterior largest and not quite regular. The petals were also four in number, the two uppermost being regular and the two lowermost spurred. Each of the former had the little tufts of hairs seen on the lateral petals in the normal flower, and were similarly pale at the base and lineated with purple, while the two spurred petals were smooth and lineated. Of the four stamens the three uppermost were normal, the fourth much enlarged; there were no antherine appendages, but at the bottom of each petal-spur there was a strong ridge not usually present and as if representing these appendages. From these appearances the author infers that in these instances the two superior petals were abortive, the tufts of hairs on the two remaining superior petals showing that they correspond with the two lateral petals of the ordinary flower; and that the two spurred petals were developed in the place of the ordinary single anterior petal. He regards the enlarged anterior stamen as consisting of two, each making an unsuccessful effort to develop an appen-

dage; and the enlarged anterior sepal also as made up of the union of the two ordinary lower sepals.

In the former case the floral envelopes were regulated by the number 4: Prof. Forbes proceeds to describe a still more remarkable case of *Peloria*, in which they were regulated by the number 3. The three sepals are of normal and equal dimensions and the three petals all spurred, and nearly but not quite equal, the odd one, which is inferior, having a larger spur than either of the other two. There is no tuft of hairs on any of the petals, but they are all lineated. The stamina are five, all furnished with appendages, the two lowermost of which, fully developed, penetrate the spur of the anterior petal, while the spur of the left upper petal receives the fully-developed appendage of one of the stamina, and that of the right also one fully-developed appendage, the appendage of the fifth stamen (small and only partially developed) bending back after proceeding only a little way. A little below the flower, between it and the true bractæ, which present their usual appearance, there is a whorl of five bract-like sepals, between two of which, and directly beneath the largest-spurred petal of the monstrous flower, is a single petal partially developed and exhibiting an abortive spur. "In this case," the author proceeds, "we have the outer whorl of floral envelopes developed, and an effort made towards the development of the second in the aborted basal petal; then the axis elongating and terminating in a flower in which two of the sepals are aborted and four of the petals, viz. the two laterals and two superior ones, for the absence of tufts of hairs prevents our regarding two of the three as the former, and the presence of lineated bases shows that they are not the latter. They are repetitions of the basal petal, which in this instance is multiplied by three, as in the cases before described it was multiplied by two." In this plant no traces of the fungus were observed.

Prof. Forbes cites the instances of *Peloria* among Violets recorded by Leers and DeCandolle, and refers to the view adopted by the latter and by M. Moquin-Tandon, viz. that the *Peloria* is caused by the tendency of all the petals to assume a spurred condition in consequence of a general effort as it were on the part of an irregular flower to become regular. He states that DeCandolle's figures are not sufficient to enable him to judge if such was the case in the instances depicted by him, but maintains that the *Peloria* Violets which form the subject of the present communication "owe their monstrous regularity to a very different phenomenon, viz. *the effort of an irregular flower to become regular by the multiplication and symmetrization of its irregular parts.*"

Read also "Descriptions of some new or imperfectly known species of *Bolboceras*." By J. O. Westwood, Esq., F.L.S. &c.

In this paper Mr. Westwood proceeds, in continuation of his former communication (see p. 365), containing a Synopsis of the Australian species of *Bolboceras*, to give descriptions of others of the genus from various parts of the world, and especially from the East Indies. The descriptions were accompanied as before with illustrative drawings.

1. *BOLBOCERAS CYCLOPS*, *Fabr.* (Ent. Syst. i. p. 15; Oliv. Ent. i. 3. t. 15. f. 140); ferrugineus; clypeo anticè carinâ transversâ tuberculisque duobus acutis instructo, vertice lineâ tenui parùm elevatâ inter oculos, pronoto utrinque excavatione profundâ subrotundâ anticè cornu acuto alteroque minori versus medium armato: spatio inter cornua intermedia plano punctato anticè lineâ semicirculari parùm elevatâ cincto canali vix distincto longitudinali ante scutellum terminato, elytris punctato-striatis striis tenuibus, tibiis anticis 8-dentatis. ♂—Long. corp. lin. 9.

Variat mas magnitudine dentium capitis et pronoti necnon profunditate excavationum hujus lateralium.

Hab. in Javâ, Assam, et Indiâ centrali. Mus. Hope (olim Lee) et nostr. (*Hearsey*).

2. *BOLBOCERAS GRANDIS*, *Hope MSS.*; rufo-castaneus, capite dentibusque tibiarum anticarum nigricantibus, clypeo carinâ tenui semicirculari, vertice carinâ transversâ inter oculorum partem anticam, pronoto convexo carinâ semicirculari tuberculisque duobus versus marginem anticam lineâque tenui longitudinali impressâ mediâ in parte posticâ.—Long. corp. lin. 9.

Hab. in Indiâ orientali? In Mus. D. Hope.

3. *BOLBOCERAS FURCICOLLIS*, *De Laporte* (An. Art. Coleopt. vol. ii. p. 104. no. 3); castaneo-rufus, sub lente granulosus, clypeo maris quadrato plano anticè bisinuato angulis lateralibus anticis in cornua duo porrectis, pronoto posticè elevato disco in medio cornubus duobus erectis distantibus recurvis alterisque duobus intùs concavis versus angulos posticos canali lævi mediano versus marginem posticam, elytris punctato-striatis, tibiis anticis extùs 6-dentatis.—Long. corp. lin. 10.

B. Lecontei, *Dej. Catal. Coleopt.*

Hab. in Americâ boreali (teste De Laporte et Mus. Hope et Gory), an recte?

4. *BOLBOCERAS FERRUGINEUS*, *De Laporte* (Hist. Nat. An. Art. Col. vol. ii. p. 104. no. 4); castaneo-fulvus sub lente granulosus, capite anticè carinâ sinuatâ anticâ tuberculoque subbifido tertio inter oculos, pronoto ante medium spatium duobus parùm elevatis lævibus lineâ tenui impressâ punctatâ (ferè ad marginem posticum extensâ) divisus utrinque

etiam versus angulos posticos impressione obliquâ suprâ carinâ lævi marginatâ, elytris punctato-striatis, tibiis anticis 6-dentatis.—Long. corp. lin. $9\frac{1}{2}$.

Hab. in Indiâ orientali? In Mus. Gory, nunc Hope.

5. *BOLBOCERAS CARENICOLLIS*, *De Laporte* (Hist. Nat. An. Art. Coleopt. vol. ii. p. 104. no. 2); *B. ferrugineo* affinis sed magis castaneus, sub lente granulosus, capite carinâ tenui marginali curvatâ verticeque tuberculis duobus parvis conicis inter oculos carinâ connexis, pronoto obscuro in medio carinâ transversâ abbreviatâ instructo maculâque nigrâ utrinque versus angulos posticos, elytris striatis striis punctis minutis, tibiis anticis 5-dentatis.—Long. corp. lin. 10.

Hab. in Indiâ orientali. In Mus. Gory (nunc Hope).

6. *BOLBOCERAS CALANUS*, *Hope MSS.*; fulvus vel rufo-castaneus, clypeo posticè bicornuto, prothorace cornubus 4 versus marginem anticam duobus intermediis contiguis et a reliquis cavitate rotundatâ utrinque separatis.—Long. corp. lin. $7-8\frac{1}{2}$.

Hab. in Indiâ orientali, Bombay. In Mus. Melly et Hope.

7. *BOLBOCERAS LÆVICOLLIS*, *Westw.*; fulvo-castaneus, vertice ante medium bidentato, prothorace glabro tuberculis 4 versus marginem anticam æquidistantibus duobus intermediis carinâ tenui curvâ conjunctis.—Long. corp. lin. $9\frac{1}{2}$.

Hab. in Indiâ orientali. In Mus. Hope.

8. *BOLBOCERAS LATERALIS*, *Westw.*; castaneus, capite pedibusque nigricantibus, capite inermi, prothorace ferè lævi, excavationibus duabus lateralibus rotundatis singulâ suprâ tuberculo acuto armatâ.—Long. corp. lin. 6.

Hab. in Indiâ orientali, Gogo. In Mus. Hope.

9. *BOLBOCERAS NIGRICANS*, *Westw.*; piceo-niger nitidus, clypeo tuberculo conico anticè armato, verticis marginibus lateralibus utrinque bituberculatis discoque carinâ elevatâ inter oculos instructo, prothorace glabro nitido anticè retuso 4-dentato dentibus subæquidistantibus.—Long. corp. lin. 6.

10. *BOLBOCERAS POLITUS*, *Westw.*; nitidus fulvus, capitè et pronoto magis castaneis, capite anticè tricorni cornu antico majori erecto, prothorace excavatione maximâ dorsali posticè trisinuatâ, elytris punctato-striatis, tibiis anticis 5-dentatis dentibus anticis magnis acutis.—Long. corp. lin. $6\frac{1}{2}$.

Hab. in Senegaliâ. In Mus. Hope (olim Gory) nomine *Athyreus porcatus*, Lap., *Senegalensis*, Dej., haud rectè inscriptus.

11. *BOLBOCERAS CORYPHÆUS*, *Fabr.* (Ent. Syst. i. p. 9; Oliv. Ent. i. 3. tab. 16. f. 150); rufo-fulvus, capite suprâ plano, clypeo anticè bicorni cornubus recurvis apice nigris posticèque mucrone elevato brevissimo nigro, pronoto anticè retuso cornubus duobus brevibus approximatis anticè porrectis apice nigris in medio disco positis posticè gibbere ob-

tuso in excavatione parùm profundâ instructo, elytris punctato-striatis, tibiis anticis 5-dentatis.—Long. corp. lin. 8.

Hab. ad Caput Bonæ Spei (teste Fabricio). In Mus. Hope (olim Lee).

12. *BOLBOCERAS SCABRICOLLIS*, *Chevrol. MSS.*; ferrugineus, capite et pronoto magis piceis punctis minutis plus minusve confluentibus scabriusculis, capite in medio carinâ brevi transversâ sub 3-lobatâ, pronoto impressionibus tribus longitudinalibus ferè oblitteratis.—Long. corp. lin. 8.

Hab. apud Caput Bonæ Spei. In Mus. D. Chevrolat.

13. *BOLBOCERAS CAPITATUS*, *Westw.*; obscurè castaneus subnitidus, capite et pronoto minutissimè punctatis hoc utrinque excavatione maximâ cornubus duobus compositis magnis separatâ, tibiis anticis obtusè 6-dentatis.—Long. corp. lin. 10½.

Hab. in Assam, Indiæ orientalis. Mus. Melly et Saunders.

14. *BOLBOCERAS INÆQUALIS*, *Westw.*; rufo-castaneus, antennarum clavâ fulvâ, capite suprâ concavo carinâ transversâ in parte posticâ, pronoto anticè valdè retuso suprâ quadridentato fossulâque mediâ profundâ, elytris striato-punctatis, tibiis anticis 6-dentatis.—Long. corp. lin. 6¼.

Hab. in Indiâ orientali. *Col. J. B. Hearsey*; in Mus. nostr.

15. *BOLBOCERAS BICARINATUS*, *Westw.*; castaneo-fulvus, capite inter oculos et ad basin clypei carinis duabus transversis nigris, pronoto tuberculis duobus parvis parùm elevatis ante medium, tibiis anticis 7-dentatis.—Long. corp. lin. 8½.

Hab. in Indiâ orientali. Mus. Melly.

16. *BOLBOCERAS DORSALIS*, *Westw.*; rufo-castaneus, capitis vertice et pronoto medio nigris punctatis, capite in medio verticis tuberculis tribus conjunctis instructo, pronoto punctatissimo ferè regulari, tibiis anticis 8-dentatis.—Long. corp. lin. 7½.

Hab. in Indiâ orientali. Mus. W. W. Saunders.

17. *BOLBOCERAS NIGRICEPS*, *Westw.*; obscurè castaneus, punctatus, capite nigricanti carinâ arcuatâ tad basin clypei tuberculisque tribus verticalibus, pronoto lineâ longitudinali impressâ utrinque cum tuberculo parùm elevato, tibiis anticis 7-dentatis.—Long. corp. lin. 7½.

Affinis præcedenti et forsitan fœmina speciei diversæ.

18. *BOLBOCERAS TRANSVERSALIS*, *Westw.*; fulvo-castaneus, capite lato carinâ rectâ transversâ elevatâ inter oculos, pronoto lineâ longitudinali anticè dilatatâ impresso.—Long. corp. lin. 4½.

Hab. in Indiâ orientali. Mus. Melly.

19. *BOLBOCERAS INDICUS*, *Hope MSS.*; fulvo-rufus, capite anticè tuberculis duobus conicis erectis armato, pronoto lævissimo anticè excavatione semicirculari parùm profundâ notato, calcari pedum anticorum elongato obtuso, tibiis anticis 9-dentatis.—Long. corp. lin. 4.

Hab. in Indiâ orientali centrali. In Mus. Saunders et Hope.

20. *BOLBOCERAS LINEATUS*, *Melley MSS.*; fulvus nitidus, capite nigro punctato inter oculos tuberculo apice subbifido armato, pronoto simplici maculâ discoidali nigrâ, elytris convexis suturâ striisque longitudinalibus elevatis nigris, tibiis anticis 8-dentatis.—Long. corp. lin. $3\frac{3}{4}$.
Hab. in insulâ Ceylon. In Mus. Melley.

Subgenus *EUCANTHUS*, *Westw.*

Corpus minùs depressum quàm in reliquis; pronoto anticè haud retuso. *Tibiæ* anticæ dentibus duobus apicalibus magnis aliisque minutis externis versus basin armato. *Elytra* punctato-striata; singulo striis 5 tantùm inter humeros et suturam, punctis profundis.

21. *BOLBOCERAS (EUCANTHUS) MELIBÆUS*, *Fabricius* (Ent. Syst. i. p. 20); rufo- vel piceo-niger, clypeo carinâ transversâ plùs minùsve elevatâ (quasi e tuberculis duobus conjunctis formatâ) verticeque cornu brevissimo truncato (parùm emarginato) instructis, pronoto subdepresso inæquali, canali punctatâ longitudinali in medio (marginem anticam haud attingente) impressionibusque lateralibus curvatis punctatis tuberculoque utrinque instructis, elytris glaberrimis punctato-striatis.—Long. corp. lin. 4–5½.

Bolboceras concinnus, *Dejean, Cat. Coleopt.*

Hab. in Americâ boreali. In Mus. D. Hope.

Mr. Westwood concludes with some observations on *Bolb. Lazarus*, Fabr., which he regards as closely allied to, if not identical with, *Bolb. Melibæus* of the same author.

June 20.

E. Forster, Esq., V.P., in the Chair.

John Shaw, Esq., M.D., was elected a Fellow.

Read a Postscript to Mr. Newport's paper on *Pteronarcys regalis*.

The author referred to the paper already read to show that the genus *Pteronarcys* ought to be arranged after *Perla*, and before *Capnia* and *Nemoura*, which it most nearly approaches in the structure of its alimentary canal; while *Perla* has affinities with the *Orthoptera* through the *Blattidæ*. The *Perla arenosa* of Pictet was regarded as making the nearest approach to the latter family, and this species was shown to be the *Perla abnormis* of Newman. The larva and pupa of this species were described from specimens taken

by Mr. Barnston in Canada, and now in the British Museum, and the habits of the species were detailed as observed by that gentleman.

The generic characters of *Pteronarcys* were proposed to be revised as follows :—

PTERONARCYS, *Newm.*

CHAR. GEN. *Segmenta thoracica* etiam in Imagine branchiis externis prædita. *Alæ* magnæ, reticulatæ. *Palpi maxillares* labialibus multò longiores, 5-articulati; articulis 2 basalibus brevibus, reliquis elongatis, externè dilatatis. *Mandibulæ* parvæ, obtusæ. *Segmentum abdominale* octavum in mari processu longo ventrali munitum, in fœminâ paulò evolutum vel bifidum.

Mr. Newport added the following new species :—

PTERONARCYS CALIFORNICUS ♂; capite thoraceque saturatè brunneis, fronte clypeo labroque rufis, oculis ocellisque nigris, segmentis thoracicis lineâ longitudinali interruptâ flavâ, abdomine aurantiaco lateribus brunneis, stylis caudalibus basi flavis, antennis pedibusque totis atris, alis obscuris nigro-nervosis sed absque maculâ stigmali.

Hab. in Californiâ (*D. Hartweg*).

The following apparently new species of Canadian *Perlida* were described, with remarks on the habits of each as observed by Mr. Barnston.

1. PERLA CITRONELLA (*Barnston MSS.*); saturatè flava, antennarum articulis 33–35, oculis ocellisque brunneis, alis hyalinis pallidè luteis margine costali flavis, abdominis dorso brunneo.—Long. lin. 3–3½.

Hab. in Canadâ, ad Albany River, latit. 54°.

2. PERLA MINIMA (*Barnston MSS.*); nigra nitida, antennarum articulis circa 26 submoniliformibus pilosis, fronte paululùm excavato, palpis subclavatis, thorace angusto subquadrato, stylis caudalibus 13-articulatis, alis obscuris nigro-nervosis in mari brevibus obtusis abdomen semicooperientibus in fœminâ amplis corpore longioribus.—Long. lin. 1¾–2.

Hab. in Canadâ, ad Albany River.

3. CAPNIA VERNALIS, *Newp.*; nigra nitida pilosa, thorace posticè rotundato, antennarum articulis 30–33 pubescentibus, alis obscuris pilosiusculis nervis magnis nigris, stylis caudalibus subulatis 21–23-articulatis.—Long. lin. 2½.

Perla vernalis, *Barnston MSS.*

Hab. in Canadâ, ad Albany River.

The fourth species, distinguished from most other *Nemouræ* by the short anterior wings of the male, the author proposed to join with *Nemoura trifasciata*, Pictet, which is similarly formed, in a subgenus for which he proposed the name *Brachyptera*.

4. NEMOURA (*Brachyptera*) GLACIALIS (*Barnston MSS.*). *Mas* saturatè brunneus ferè niger, thoracis margine anteriore recto, alis anterioribus triangularibus rudimentalibus segmentum abdominale primum tantùm attingentibus; posterioribus albidis longissimis acutis emarcidis decussatis, antennis elongatis pubescentibus 53-56-articulatis, pedibus longis compressis cursoriis; paris postremi longissimis, abdominis segmento terminali lato plano pubescente.

Fœmina multò major, in reliquis tamen similis, capite paululùm excavato, alis amplis obscurè brunneis nigro-nervosis.—Long. unc. $\frac{1}{2}$.

Hab. in Canadâ, ad Albany River.



INDEX.

| | Page | | Page |
|---------------------------------|---------------|--------------------------------|--------------------|
| Abutilon benedictum | 109 | Araucaria excelsa | 322 |
| Acacia Catechu | 16 | Ardea Nycticorax | 116 |
| — modesta | 15 | Argonauta Argo | 236 |
| Acanthocercus muricatus | 197 | Argynnis | 229 |
| Acanthodium spicatum | 63, 64 | Argynnis Aceste | 234 |
| Acanthus ilicifolius | 64 | — Alcandra | 234 |
| — mollis | 64 | — Egesta | 235 |
| Accia lucida | 200 | — Iole | 234 |
| Achyranthes paludosa | 109 | — Lucida | 234 |
| Aceronema tenerum | 252 | — Metea | 234 |
| Adiantum Capillus Veneris | 317 | — Thais | 234 |
| Adoxa inodora | 17 | Argyroneta aquatica | 132 |
| — Moschatellina | 17 | Arundinaria Schomburgkii | 51 |
| Aeshna liassina | 307 | — verticillata | 51 |
| Agama cornuta | 57 | Asafetida Disgumensis | 309 |
| Agaricus atramentarius | 20 | Asiphonia | 189 |
| — comatus | 20 | Asiphonia piperiformis | 218 |
| — crinitus | 230 | Aspidium Barometz | 58 |
| — cylindricus | 20 | Asplenium Filix Femina | 326 |
| — finetarius | 20 | — Harovii | 159 |
| — Marie | 32 | — Petrarchæ | 159, 160 |
| — ovatus | 20 | — Trichomanes | 159, 317 |
| — porcellaneus | 20 | — viride | 159 |
| — serrulatus | 32 | Atamisquea emarginata | 356 |
| Agelena | 41 | Athalamia pinguis | 343 |
| Agraulis | 234 | Athlia rustica | 199 |
| Alhagi Maurorum | 15, 91 | Athyreus armatus | 358 |
| Alphitobius? punctatus | 201 | — bellator | 358 |
| Ambrosinia ciliata | 263 | — bifurcatus | 359 |
| — retrospiralis | 264 | — Bilbergii | 359 |
| — spiralis | 264 | — centralis | 359 |
| — unilocularis | 264 | — furcicollis | 359 |
| Ammodytes | 152 | — furcifer | 359 |
| Amphidetus Mediterraneus | 185 | — gigas | 358 |
| Amphiura Chiajii | 176 | — Pholas | 359 |
| — florifera | 175 | — porcatus | 359, 385 |
| — neglecta | 176 | — purpureipennis | 359 |
| Anagallis arvensis | 119 | — recticornis | 359 |
| Anas acuta | 46 | — rotundus | 358 |
| — Boschas | 46 | — Senegalensis | 359, 385 |
| Andrena Trimerana | 319 | — subarmatus | 358 |
| Anemone pratensis | 101 | — tuberculatus | 358 |
| Anoplophora Stanleyana | 43 | — Tweedyanus | 359 |
| Anotia coccinea | 84 | Attus coronatus | 132 |
| Anthophora retusa | 270, 327, 328 | Aucklandia Costus | 81 |
| — | 292 | Avicennia | 171, 223, 224, 225 |
| Apocopis Royleanus | 94 | Azalea | 118 |
| Apodytes | 87 | Bacillaria paradoxa | 310, 312 |
| Apteria setacea | 60 | Balanophora affinis | 220 |

| | Page | | Page |
|-----------------------------------|----------|-------------------------------|---------------|
| Balanophora alveolata | 220 | Bolboceras serricollis | 366 |
| — Burmannica | 219 | — Taurus | 366 |
| — picta | 220 | — transversalis | 386 |
| — (Polypetia) polyandra | 220 | — 3-tuberculatus | 366 |
| Balsamodendron Myrrha | 182 | Bombyx Huttoni | 357 |
| — Opobalsamum | 182 | — Mori | 357 |
| Bambusa latifolia | 50 | Brachygaster castaneus | 198 |
| Barkhausia setosa | 179 | Brachyptera | 388 |
| — taraxacifolia | 98, 99 | Bragantia | 218 |
| Barleria noctiflora..... | 64 | Breweria evolulooides | 367 |
| Bassia butyracea..... | 215 | Briza maxima | 81 |
| — latifolia | 215 | Butea frondosa | 15 |
| — longifolia | 215 | Butomus umbellatus | 15 |
| — ? Parkii | 215 | Cadaba Indica..... | 367 |
| Batrachospermum plumosum..... | 165 | Cælebogyne | 41 |
| Batratherum micans | 93 | Caladium ovatum | 264 |
| Belone vulgaris | 28 | Calamintha | 179 |
| Bersama | 361, 362 | Calathea zebrina | 68 |
| Biatora anomala | 32 | Callichloris perelegans | 198 |
| — Krockiana | 32 | Callichroma Cantori | 43 |
| Bignonia venusta | 110 | — Griffithii..... | 43 |
| Bixa Orellana | 13 | Calligonum polygonoides | 367 |
| Blechnum Brownii | 64 | Callipeltis | 90 |
| Boa Constrictor | 52 | Calotropis Hamiltonii..... | 15 |
| Bolboceras (Elephastomus) Austra- | | Camelina sativa | 162 |
| lasie | 366 | Campelepis viminea | 130 |
| — Bainbridgii..... | 366 | Canptorhina atricapilla | 199 |
| — bicarinatus..... | 386 | Cappia vernalis | 388 |
| — Calanus | 385 | Capparis aphylla | 16 |
| — capitatus | 386 | Carapa Guianensis | 214 |
| — Capreolus | 366 | — Touloucouna | 214 |
| — carenicollis..... | 385 | Carex abbreviata..... | 260 |
| — concinnus | 387 | — acuminata | 211 |
| — coronatus | 366 | — acuta | 210 |
| — Coryphæus..... | 385 | — acutata | 287 |
| — Cyclops | 384 | — Æthiopica | 260 |
| — dorsalis | 386 | — alba | 211 |
| — ferrugineus..... | 384 | — alopecurus | 212 |
| — furcicollis | 384 | — alpestris | 259 |
| — grandis | 384 | — alta | 254 |
| — hastifer | 359, 366 | — alveata | 287 |
| — inæqualis | 386 | — ampullacea..... | 212 |
| — Indicus | 386 | — aquatilis | 210 |
| — Kirbii | 365 | — arctata | 287 |
| — lævicollis | 385 | — arenaria | 210 |
| — lateralis | 385 | — Arnottiana | 260 |
| — Lazarus | 387 | — aterrima | 210 |
| — Lecointei..... | 384 | — atrata | 210, 256, 257 |
| — lineatus | 387 | — axillaris | 210 |
| — Melibœus | 387 | — badia | 212 |
| — neglectus | 366 | — Bænninghausiana | 210 |
| — nigricans | 385 | — Baldensis | 210 |
| — nigriceps | 386 | — Banksii | 257 |
| — nigricornis..... | 366 | — Bastardiana | 212 |
| — politus | 385 | — bicolor | 210 |
| — quadricornis | 366 | — binervis | 211 |
| — Reichii | 365 | — bispicata | 259 |
| — rotundatus | 366 | — Bongardi | 260 |
| — rubescens | 366 | — Boryana | 258 |
| — scabricollis | 386 | — brachystachys | 286 |
| — 7-tuberculatus | 366 | — brevicollis | 211 |

| | Page | | Page |
|------------------------|----------|-------------------------|----------|
| Carex brevifolia | 211 | Carex Goodenovii | 210, 255 |
| — brizoides..... | 210 | — Grahani..... | 180 |
| — bullata | 287, 288 | — Griffithii..... | 286 |
| — Buxbaumii | 210 | — Griolletii..... | 211 |
| — cespitosa..... | 210 | — grypos..... | 210 |
| — Cainschatcense | 259 | — Gunniana | 258 |
| — capillaris..... | 211 | — gynobasis | 210, 259 |
| — capitata | 209 | — helconastes..... | 210 |
| — chordorhiza | 210 | — hirsuta | 256 |
| — cinnamouea | 257 | — hirta | 212, 259 |
| — clandestina..... | 211 | — hispida | 211 |
| — claviformis..... | 211 | — hordeiformis | 212 |
| — coacta..... | 285 | — Hornschluchiana | 211 |
| — Columbiana | 256 | — Horsfieldii | 257 |
| — comosa | 258 | — Hostiana | 211 |
| — conglobata | 288 | — Houghtonii | 259 |
| — coriophora | 256, 257 | — hymenolepis | 288 |
| — costata | 212 | — incurva | 210 |
| — crinalis | 256 | — intermedia | 210 |
| — crinita | 286 | — irrigua | 211 |
| — curta | 210 | — Jackiana..... | 260 |
| — curvula | 210 | — Jamesoni | 258 |
| — cyperoides | 210 | — Japonica..... | 259 |
| — Darwinii..... | 261 | — juncea..... | 286 |
| — Davalliana | 209 | — juucoides | 212 |
| — decidua | 255 | — lævigata | 211, 258 |
| — decipiens | 209 | — lagopina | 210 |
| — depauperata | 211 | — lanceolata | 211 |
| — digitata | 211 | — Langsdorffii | 259 |
| — diluta | 260 | — lasiochlæna | 211 |
| — dioica | 209 | — laxiflora | 258 |
| — distans | 211, 260 | — Lemniana | 256 |
| — divisa | 210 | — leucantha..... | 257 |
| — divulsa | 210 | — Ligerica..... | 210 |
| — dura | 255 | — limosa..... | 211 |
| — elongata | 210 | — Linkii | 210 |
| — ericetorum | 211 | — lobata | 210 |
| — Esenbeckii..... | 285 | — loliacea | 210 |
| — evoluta | 212 | — longiaristata | 211 |
| — extensa | 211 | — longirostrata | 259 |
| — ferruginca | 211 | — lucida | 287 |
| — filicina | 286 | — ludibunda | 210 |
| — filiformis..... | 212 | — macrolepis | 210 |
| — fimbriata | 211 | — Magellanica | 257 |
| — firma | 211 | — Mairii..... | 211 |
| — flava | 211 | — manostachys | 212 |
| — fetida..... | 210 | — meiogyna | 286 |
| — frigida..... | 211 | — Mertensii | 256 |
| — fuliginosa | 211 | — Michellii | 211 |
| — fulva | 211 | — microcarpa..... | 211 |
| — furcata | 212, 258 | — microglochium | 210 |
| — fusca | 212 | — microstachya | 210 |
| — Gebleri | 261 | — microstyla | 210 |
| — geminata | 254 | — miser | 286 |
| — geniculata | 211 | — modesta | 210 |
| — Genuensis | 211 | — Mœnchiana | 210 |
| — Geyeri | 285 | — mollis | 211 |
| — glauca | 211 | — montana..... | 211 |
| — glaucescens | 255 | — Moorcroftii | 288 |
| — globosa | 259 | — mucronata | 210 |
| — glomerata | 285 | — muricata..... | 210 |

| | Page | | Page |
|---|--------------------|--------------------------------------|----------|
| <i>Carex Neesiana</i> | 260 | <i>Carex spadicea</i> | 211 |
| — <i>nesliaca</i> | 212 | — <i>spicata</i> | 210 |
| — <i>nigra</i> | 210 | — <i>spiculata</i> | 288 |
| — <i>nitida</i> | 211 | — <i>stellulata</i> | 210 |
| — <i>nivalis</i> | 256 | — <i>stenophylla</i> | 210 |
| — <i>nutans</i> | 212 | — <i>striata</i> | 261 |
| — <i>Ederi</i> | 211 | — <i>strigosa</i> | 211 |
| — <i>olivacea</i> | 286 | — <i>subdola</i> | 255 |
| — <i>orbicularis</i> | 254 | — <i>Sullivantii</i> | 287 |
| — <i>ornithopoda</i> | 211 | — <i>supina</i> | 210 |
| — <i>ovalis</i> | 210 | — <i>Suteri</i> | 209 |
| — <i>paleata</i> | 259 | — <i>sylvatica</i> | 211 |
| — <i>pallescens</i> | 211 | — <i>tenuis</i> | 211 |
| — <i>paludosa</i> | 212, 260, 287 | — <i>tenuissima</i> | 288 |
| — <i>panicea</i> | 211, 288 | — <i>teretiuscula</i> | 210 |
| — <i>paniculata</i> | 210 | — <i>thecata</i> | 287 |
| — <i>paradoxa</i> | 210 | — <i>tomentosa</i> | 211 |
| — <i>pauciflora</i> | 210 | — <i>trichocarpa</i> | 260 |
| — <i>peudula</i> | 211, 286 | — <i>trinervis</i> | 210, 285 |
| — <i>phyllostachys</i> | 285 | — <i>triquetra</i> | 259 |
| — <i>physocarpa</i> | 181, 287 | — <i>Tuckermanni</i> | 287 |
| — <i>Pichinchensis</i> | 255, 256 | — <i>Tweddiana</i> | 259 |
| — <i>pilosa</i> | 211 | — <i>umbrosa</i> | 211 |
| — <i>pilulifera</i> | 211 | — <i>ustulata</i> | 211 |
| — <i>platystachya</i> | 210, 257, 285 | — <i>vaginata</i> | 211 |
| — <i>polytrichoides</i> | 284 | — <i>Vahlil</i> | 210 |
| — <i>præcox</i> | 211 | — <i>valida</i> | 257 |
| — <i>Prescottiana</i> | 286 | — <i>verna</i> | 288 |
| — <i>pruinosa</i> | 255 | — <i>vesicaria</i> | 212, 261 |
| — <i>pseudo-cyperus</i> | 211, 258 | — <i>vulpina</i> | 210, 285 |
| — <i>pubescens</i> | 260 | — <i>Walkeri</i> | 257 |
| — <i>pulicaris</i> | 209 | <i>Careya arborea</i> | 280 |
| — <i>pulla</i> | 181, 254 | — <i>herbacea</i> | 280 |
| — <i>pulla</i> β . <i>fusca</i> | 181 | <i>Carum Bulbocastanum</i> | 51 |
| — <i>punctata</i> | 211 | <i>Cassia obovata</i> | 16 |
| — <i>Pyrenaica</i> | 210 | — <i>obtusata</i> | 16 |
| — <i>Rafflesiana</i> | 285 | <i>Catophractes Alexandri</i> | 4 |
| — <i>ramosa</i> | 286 | <i>Caulerpa prolifera</i> | 294 |
| — <i>raphidocarpa</i> | 286 | <i>Cedrela Toona</i> | 178 |
| — <i>rara</i> | 284 | <i>Cenchræa dorsalis</i> | 85 |
| — <i>rariflora</i> | 211 | <i>Centaurea moschata</i> | 118 |
| — <i>reflexa</i> | 211 | <i>Cerapterus Brasiliensis</i> | 75, 113 |
| — <i>refracta</i> | 211 | — <i>Horsfieldii</i> | 75, 113 |
| — <i>remota</i> | 210, 254 | — <i>latipes</i> | 113 |
| — <i>repens</i> | 210 | — <i>MacLeaii</i> | 113 |
| — <i>rigida</i> | 181, 210 | — <i>piceus</i> | 75, 113 |
| — <i>riparia</i> | 212 | — <i>4-maculatus</i> | 113 |
| — <i>rotundata</i> | 261 | — <i>quadrinotatus</i> | 75 |
| — <i>Rugeliana</i> | 286 | — <i>Smithii</i> | 113 |
| — <i>rupestris</i> | 210 | — <i>Westermanni</i> | 75, 113 |
| — <i>sanguinea</i> | 285 | <i>Ceratoderus bifasciatus</i> | 113 |
| — <i>Sarda</i> | 210 | <i>Cereus gaudiflorus</i> | 8 |
| — <i>saxatilis</i> | 180, 181, 210, 254 | — <i>speciosissimus</i> | 68 |
| — <i>schœnoides</i> | 210 | — <i>tetragonus</i> | 7 |
| — <i>Schreberi</i> | 210 | <i>Cethosia</i> | 234 |
| — <i>secalina</i> | 212 | <i>Chætophora</i> | 165 |
| — <i>sempervirens</i> | 211 | <i>Chara crinita</i> | 294 |
| — <i>setigera</i> | 288 | <i>Chartergus Morio</i> | 189 |
| — <i>Sinai</i> | 260 | <i>Cheirotonus MacLeayii</i> | 78 |
| — <i>socia</i> | 254 | <i>Chiasognathus Grantii</i> | 346 |
| — <i>Soleirolil</i> | 212 | <i>Chiton</i> | 322, 323 |

| | Page | | Page |
|---------------------------------|----------|--|---------------|
| Chitonellus | 322, 323 | Cuscuta epilinum | 44 |
| Chitonellus fasciatus | 323 | — halophyta | 44 |
| Chondrus crispus | 268, 283 | Cuterebra fontanella | 100 |
| Choripetalum aurantiacum | 327 | Cycadæa | 53, 54 |
| — undulatum | 327 | Cycas circinalis | 54, 56 |
| — viridiflorum | 327 | — glauca | 54, 56 |
| Chrysæus Javanicus | 236 | — revoluta | 54, 55, 56 |
| — saccatus | 236 | — speciosa | 54, 56 |
| — Sumatrensis | 236 | Cymbocarpa refracta | 62 |
| Chrysochroa Edwardsii | 128 | Cynomorium | 219 |
| Chrysocvathus | 17 | Cypræa Tigris | 308 |
| Chrysophyllum monopyrenum | 99 | — venusta | 314 |
| Cibotium Baromez | 57 | Cytinus | 190 |
| Cidaris Hystrix | 186 | Cytinus dioicus | 217 |
| — papillaris | 186 | Cyttaria Berteroi | 97 |
| Ciniflo ferox | 132 | — Darwinii | 97 |
| Cinnamomum Zeylanicum | 215 | Dammara australis | 321 |
| Circaea Lutetiana | 294 | Decatoma | 233 |
| Cistuda Carolina | 116 | Dendrobium normale | 14 |
| Clagia | 234 | Depazea pyricola | 32 |
| Clangula Barrovii | 21 | Derbe costalis | 83 |
| Clidemia biserrata | 110 | — elongata | 84 |
| — deflexa | 108 | — fasciolata | 84 |
| — glabrata | 108 | — fritillaris | 84 |
| — longibarbis | 110 | — hæmorrhoidalis | 82 |
| — urceolata | 110 | — nervosa | 82, 84 |
| Cliococca | 90 | — nivea | 83 |
| Clothilda | 235 | — pallida | 83 |
| Clubiona | 41 | — punctum | 83 |
| — accentuata | 132 | — semistriata | 83 |
| — atrox | 66 | — sinuosa | 84 |
| — epimelas | 132 | — squamigera | 83 |
| — erratica | 132 | — stellulata | 84 |
| — saxatilis | 66 | — strigipennis | 83 |
| Cocos nucifera | 215 | — testacea | 83 |
| Collops 4-maculatus | 112 | Desmocephalum | 277 |
| Colobotheca rubricollis | 128 | Desmochæta sordida | 109 |
| Colporhina bifoveolata | 200 | Dianthus Caryophyllus imbricatus | 119 |
| Conferva fluviatilis | 65 | Diaperus Boleti | 328 |
| Confervæ | 163 | Diatoma fasciculatum | 82 |
| Coniferæ | 53, 54 | — truncatum | 82 |
| Coniothecium amentaceum | 32 | Dictyocalyx | 277 |
| Conjugata | 164 | Dictyostega costata | 61 |
| Convallaria multiflora | 119 | — orobanchoides | 61, 63 |
| Copris lunaris | 346 | — Schomburgkii | 61 |
| — punctatissima | 197 | — umbellata | 61 |
| — semisquamosa | 197 | Didesmus panduriformis | 367 |
| Corchorus depressus | 367 | Dielocerus | 186 |
| — humilis | 367 | Dielocerus Ellisii | 187 |
| Corylus Avellana | 18, 89 | Diospyros edulis | 134 |
| Corysadenia | 281 | Diplerisma | 361, 362 |
| Cremauium cordifolium | 109 | Dipteracanthus erectus | 64 |
| Crepis biennis | 98, 99 | Dischidia Bengalensis | 324 |
| Crotalaria Bushia | 15 | — Rafflesiana | 279, 324, 325 |
| Cruckshanksia graminea | 122 | Disporum calcaratum | 45 |
| Cryptocoryne ciliata | 264 | — fulvum | 45 |
| Cryptolepis | 114, 115 | — Hamiltonianum | 45 |
| Cryptolepis Buchananii | 114 | — Horsfieldii | 45 |
| — reticulata | 114 | — Leschenaultianum | 45 |
| Cryptophagus cellaris | 327, 328 | — parviflorum | 45 |
| Cupressus torulosa | 18 | — Pitsutum | 45 |

| | Page | | Page |
|----------------------------------|----------|-------------------------------|----------|
| Disporum Wallichii | 45 | Eucalyptus globulus | 177 |
| Diurospermum album | 351 | — mannifera | 178 |
| Dodonæa Burmanniana | 16 | — robusta | 178 |
| Dolomedes fimbriatus | 132 | Eucanthus | 387 |
| Dorcas deHaani | 127 | Euoplia polyspila | 42 |
| — ruffemorali | 200 | Euryale ferox | 17 |
| — Westermanni | 127 | Eurytoma | 233 |
| Dothidea chaetomium..... | 32 | Euterpe oleracea..... | 215 |
| Draparnaldia tenuis | 165 | Eutropis | 15 |
| Drassus | 41 | Exilaria fasciculata..... | 82 |
| Drassus ater | 131 | Ferula Asafoetida..... | 309 |
| — exiguus | 66 | Fibularia angulosa | 185 |
| — sericeus | 131 | — Ovulum | 185 |
| — viridissimus | 66 | — Tarentina | 185 |
| Dysdera erythrina | 133 | Fothergilla involucrata | 18 |
| — Hombergii | 133 | Fraxinus floribunda | 15 |
| — rubicunda | 133 | Fritillaria imperialis | 18 |
| Echinochlamys pusillus | 185 | — Meleagris | 134 |
| Echinus decoratus | 186 | Fuchsia fulgens | 118 |
| — esculentus | 185 | Fucus spinosus | 268 |
| — lividus..... | 185 | — striatus | 267 |
| — miliaris | 186 | Galapagoa | 277 |
| — monilis | 185 | Galium Vaillantii | 222 |
| — pulchellus | 186 | Ganoplexis | 14 |
| Ectosperma clavata | 226 | Ganoplexis orobanchoides..... | 320 |
| Ectospora clavata | 8 | Gentiana campestris | 119 |
| Edgworthia buxifolia | 129 | Geometra trumaria..... | 354 |
| Elæis Guineensis..... | 215 | Geotropidæ | 197 |
| Elephantomus proboscideus | 365 | Geryonia proboscidalis | 223 |
| Elymus sabulosus | 4, 161 | Gibsonia | 367, 368 |
| Emalodera multipunctata | 200 | Gloxinia speciosa | 68 |
| Encephalartos horridus | 9, 54 | Gonyanthus candida | 60 |
| — pungens | 52 | Granularia Violæ | 382 |
| — spiralis | 54 | Grislea tomentosa | 16 |
| Enhalus | 219 | Gymnema sylvestris | 353 |
| Enteromorpha intestinalis .. | 152, 153 | Gymnosiphon aphyllum..... | 60 |
| Epeira agelena | 133 | Hastingsia coccinea | 16 |
| — antriada | 133 | Hectocotyle Argonautæ..... | 237, 238 |
| — bicornis | 133 | — Octopodis | 237 |
| — fusca | 133 | — Tremoctopodis | 237 |
| — scalaris | 133 | Heliampora nutans | 53 |
| — umbratica | 133 | Heliconia..... | 350 |
| Ephedra | 90 | Heliconidæ | 348, 349 |
| Epicauta conspersa..... | 202 | Helosciadium ? tenerum..... | 252 |
| Epilasium rotundatum | 201 | Hemiramphus | 151 |
| Epimedium hydaspidis | 18 | Henslowia | 281 |
| Epipedonota marginiplicata | 201 | Heracleum giganteum | 284 |
| Epiphanes Javanica | 321 | Hexarthrius Parryi..... | 127 |
| Epipone Lecheguana | 188 | Hiræa cinerea | 109 |
| — nidulans | 188 | Hirundo Apus..... | 296 |
| Epitragus æneo-brunneus | 201 | — esculenta | 268 |
| — semicastaneus | 201 | — riparia..... | 296 |
| Equisetum Drummondii | 222 | — rustica..... | 297 |
| — hyemale | 74, 290 | — urbana..... | 296 |
| Ergalis latens | 132 | Hister castaneus | 196 |
| Ergotætia abortans..... | 7 | — furcatus | 196 |
| — abortifaciens | 52 | — Mathewsii | 196 |
| Eriocaulon setaceum | 271-273 | Holostemma | 16 |
| — Wallichianum | 272 | Hoepa glandulosa | 282 |
| Eriocaulonæ | 271 | Hovenia dulcis | 16 |
| Erythrochiton Wallichianum..... | 282 | Hydnora | 189 |

| | Page | | Page |
|---|----------|--|----------|
| <i>Hydnora Africana</i> | 217 | <i>Lepidosperma elatior</i> | 4 |
| <i>Hydrodictyon</i> | 165 | <i>Leptatherium Royleanum</i> | 93 |
| <i>Hydrophilidæ</i> | 197 | <i>Leptynoderus tuberculatus</i> | 200 |
| <i>Hydrophilus chalybeatus</i> | 197 | <i>Lepurandra saccidora</i> | 73 |
| — <i>ochripes</i> | 197 | <i>Leretia</i> | 87 |
| <i>Hylotoma formosa</i> | 187 | <i>Leucothyreus ? antennatus</i> | 198 |
| <i>Hylotorus bucephalus</i> | 112 | — <i>spurius</i> | 198 |
| <i>Hymenophyllum Tunbridgense</i> | 326 | <i>Lilium bulbiferum</i> | 295 |
| <i>Illigera</i> | 281 | <i>Linnaea borealis</i> | 315 |
| <i>Iris germanica</i> | 295 | <i>Linyphia</i> | 41 |
| — <i>kamaonensis</i> | 8 | <i>Linyphia pallida</i> | 133 |
| — <i>longifolia</i> | 8 | <i>Lithobiidæ</i> | 231 |
| — <i>Moorcroftiana</i> | 8 | <i>Lodoicea Seychellarum</i> | 153 |
| — <i>sambucina</i> | 46 | <i>Loranthus bicolor</i> | 169, 170 |
| — <i>versicolor</i> | 46 | — <i>globosus</i> | 169, 170 |
| <i>Isoetes capsularis</i> | 121, 122 | <i>Lucanidæ</i> | 200 |
| — <i>lacustris</i> | 24 | <i>Lucanus astacoides</i> | 78 |
| <i>Isosoma</i> | 233 | — <i>Brahmius</i> | 127 |
| <i>Ithomia</i> | 349, 350 | — <i>Buddha</i> | 127 |
| <i>Ituna</i> | 349, 350 | — <i>bulbosus</i> | 78 |
| <i>Jacaranda mimosifolia</i> | 68 | — <i>curvidens</i> | 78 |
| <i>Jansonia formosa</i> | 330 | — <i>Forsteri</i> | 77 |
| <i>Juncus bufonius</i> | 9 | — <i>foveatus</i> | 78 |
| — <i>concinus</i> | 10 | — <i>Nepalensis</i> | 78 |
| — <i>diffusus</i> | 313 | — <i>omissus</i> | 78 |
| — <i>glaucus</i> | 9 | — <i>punctiger</i> | 78 |
| — <i>indicus</i> | 10 | — <i>Rafflesii</i> | 77 |
| — <i>leucanthus</i> | 10 | — <i>serricollis</i> | 78 |
| — <i>leucomelas</i> | 10 | — <i>Spencei</i> | 78 |
| — <i>membranaceus</i> | 10 | <i>Lupinus nitidissimus</i> | 109 |
| <i>Juniperus virginiana</i> | 58 | <i>Luzula spicata</i> | 9 |
| <i>Kleinia articulata</i> | 274 | <i>Lycorea</i> | 350 |
| <i>Lagurus ovatus</i> | 49, 81 | <i>Lycosa</i> | 41 |
| <i>Lamia Hörsfieldii</i> | 42 | <i>Lycosa agretyca</i> | 132 |
| — <i>nigricornis</i> | 79 | — <i>aliodroma</i> | 132 |
| — <i>Swainsoni</i> | 79 | — <i>andrenivora</i> | 132 |
| <i>Lasiandra calyptrata</i> | 108 | — <i>leucophæa</i> | 132 |
| — <i>fissinervia</i> | 110 | — <i>lugubris</i> | 132 |
| — <i>Fontanesiana</i> | 110 | — <i>pallida</i> | 132 |
| — <i>proteæformis</i> | 110 | — <i>picta</i> | 132 |
| <i>Lastrea rigida</i> | 52 | — <i>piratica</i> | 132 |
| <i>Lathonia</i> | 235 | <i>Lydda elongata</i> | 84 |
| <i>Laurus nobilis</i> | 215 | <i>Macræa</i> | 278 |
| <i>Lebioderus Goryi</i> | 112 | <i>Macroctylus marmoratus</i> | 200 |
| <i>Lecanora elatina</i> | 32 | <i>Madia sativa</i> | 77 |
| <i>Lecidea miscella</i> | 32 | <i>Mahonia Nepalensis</i> | 18 |
| — <i>nitidula</i> | 32 | <i>Malachius</i> | 112 |
| <i>Leersia oryzoides</i> | 222 | <i>Manduculus vernalis</i> | 133 |
| <i>Lemania</i> | 165 | <i>Marchantia polymorpha</i> | 240 |
| <i>Lemania fluviatilis</i> | 360 | <i>Matricaria</i> | 119 |
| — <i>torulosa</i> | 360 | <i>Mechanitis</i> | 349, 350 |
| <i>Lentinus crinitus</i> | 230 | <i>Medusa proboscidalis</i> | 222 |
| — <i>Leveillei</i> | 231 | <i>Melanocenchris Rothiana</i> | 95 |
| — <i>nigripes</i> | 231 | — <i>Royleana</i> | 95 |
| — <i>Schomburgkii</i> | 230 | <i>Melianthææ</i> | 361, 362 |
| — <i>Swartzii</i> | 230 | <i>Melianthus comosus</i> | 361 |
| — <i>tener</i> | 230 | — <i>Himalayanus</i> | 364 |
| <i>Lepidagathis</i> | 64 | — <i>major</i> | 364 |
| <i>Lepidodendron Harcourtii</i> | 345 | — <i>minor</i> | 361 |
| <i>Lepidosiren annectens</i> | 32 | <i>Melilotus arborea</i> | 77 |
| — <i>paradoxa</i> | 27, 28 | — <i>leucantha</i> | 77 |

| | Page | | Page |
|--|---------------|-------------------------------------|----------|
| Melitæa | 235 | Odontolabis Cuværa..... | 127 |
| Meloë .. 317, 318, 319, 346, 347, 348, | 368, 369, 370 | Edipodium Griffithianum | 33 |
| Meloë cicatricosus | 268-270 | Enocarpus distichus | 215 |
| — proscarabæus..... | 268-270 | Estrus Bovis | 100 |
| — violaceus | 268-270 | — Clarkii | 100 |
| Meloseira..... | 165 | — Equi | 100 |
| Meloseira varians | 166 | — ericetorum | 100 |
| Mentha crispa | 81 | — hemorrhoidalis | 100 |
| Menyanthes trifoliata..... | 17 | — Libycus | 100 |
| Microcæcia | 278 | — lineatus | 100 |
| Microgaster alvearia | 228 | — nasalis | 100 |
| Mimela Passerinii | 128 | — Pecorum..... | 100 |
| Mitragenius araneiformis | 201 | — pictus | 100 |
| Modecopsis | 171 | — Tarandi | 100, 179 |
| Monochamus beryllinus..... | 79 | — Trompe | 100, 179 |
| — ruber | 43 | — veterinus..... | 100 |
| — sulphurifer | 128 | Olox acuminata | 89 |
| Mordella argentipunctata | 202 | — macrophylla | 89 |
| — Tachyporiformis | 202 | — nana | 88 |
| Morisonia Asiatica..... | 367 | — pauciflora | 89 |
| — Lawiana | 367 | Olea Laitoona | 130 |
| Motella glauca | 151 | Oliva Brasiliensis | 308 |
| Mougeotia..... | 164 | — Utriculus | 308 |
| Musa Cavendishii | 157 | Oönops pulcher | 133 |
| Musca canicularis | 52 | Opegrapha signata | 32 |
| Myraptera brunnea..... | 188, 189 | Ophiderma lacertosa..... | 175 |
| — elegans | 188, 189 | Ophiomeris Iguassuensis | 329 |
| — scutellaris | 189 | — Macaheusis | 329 |
| Myrioblastus | 264 | Ophiomyxa lubrica | 175 |
| Myristica moschata | 215 | Ophiopsila Aranea | 175 |
| Myrsine ? aurantiaca | 327 | Ophiothrix Rosula | 176 |
| — undulata | 327 | Ophiura abyssicola | 168 |
| Mysidia | 84 | — albida | 168 |
| Mysidia albipennis | 83 | — filiformis..... | 176 |
| — lactiflora | 83 | — lacertosa..... | 175 |
| — subfasciata | 83 | — neglecta..... | 176 |
| Mystropetalon | 190 | — texturata..... | 168 |
| Mystropetalon Thomii | 219 | Ophrydeæ | 10 |
| Nacerdes ? alternans | 202 | Oplocephala quadrituberculata | 201 |
| Narthex Asafetida | 309 | Oplophora Sollyi..... | 43 |
| Natalia..... | 361, 362 | Oreocome elata | 253 |
| Nemoura trifasciata | 388 | — filicifolia | 253 |
| Neottia aestivalis | 80 | Orobanche | 219 |
| — gemmipara | 162, 189 | Orthoraphium Roylei | 94 |
| Nepenthes distillatoria | 91, 92, 217 | Oryctomorphus pictus | 197 |
| Neriene | 41 | Osyris Nepalensis | 169, 223 |
| Neriëne graminicolens | 133 | Pacuvia castanea..... | 199 |
| — trilineata | 132, 133 | Panopæa Aldrovandi | 160 |
| Nerium reticulatum | 114 | Papaver bracteatum | 158, 159 |
| Neurocarpum angustifolium | 110 | — orientale | 158, 159 |
| — resupinatum | 110 | — orientale bracteatum | 158, 159 |
| Nuytsia floribunda | 123 | — — præcox | 158 |
| Nyctelia Bremii | 201 | — — serotinum | 158 |
| — caudata | 200 | — somniferum | 159 |
| — ? corrugata | 201 | Papaveraceæ | 219 |
| — Fitzroyi | 201 | Papilio Hector | 131 |
| — granulata | 201 | Papilionidæ | 350 |
| — undatipennis | 201 | Paris polyphylla | 15 |
| Nycterinus rugiceps | 201 | Paspalum exile | 157, 167 |
| Odontolabis Baladæna..... | 127 | Patara albida | 85 |
| | | — guttata | 85 |

| | Page | | Page |
|--|----------|---------------------------------------|---------------|
| <i>Paussus affinis</i> | 112 | <i>Pinus Pumilio</i> | 89 |
| — <i>armatus</i> | 112 | — <i>sylvestris</i> | 89 |
| — <i>bifasciatus</i> | 113 | <i>Plagiolytrum calycinum</i> | 95 |
| — <i>Burmeisteri</i> | 111 | — <i>filiforme</i> | 95 |
| — <i>cochlearius</i> | 111 | — <i>unidentatum</i> | 95 |
| — <i>cognatus</i> | 112, 133 | <i>Platyrhopalus acutidens</i> | 112 |
| — <i>cornutus</i> | 112 | — <i>angustus</i> | 112 |
| — <i>curvicornis</i> | 112 | — <i>aplustrifer</i> | 112, 116 |
| — <i>excavatus</i> | 111 | — <i>denticornis</i> | 112, 115 |
| — <i>Fichtelii</i> | 111 | — ? <i>dentifrons</i> | 112 |
| — <i>fulvus</i> | 111 | — ? <i>lævifrons</i> | 112 |
| — <i>Hardwickii</i> | 112 | — <i>Melleii</i> | 112 |
| — <i>Hearseyanus</i> | 133 | — <i>unicolor</i> | 112 |
| — <i>Jousselinii</i> | 111 | — <i>Westwoodii</i> | 112 |
| — <i>Klugii</i> | 111 | <i>Pleuropetalum</i> | 278 |
| — <i>lineatus</i> | 112 | <i>Pleurospermum cicutarium</i> | 253 |
| — <i>Linnæi</i> | 111 | <i>Plumatella</i> | 8 |
| — <i>microcephalus</i> | 111 | <i>Podophyllum Emodi</i> | 15 |
| — <i>pilicornis</i> | 111 | <i>Pogopetalum acuminatum</i> | 88 |
| — <i>ruber</i> | 111, 115 | — <i>orbiculatum</i> | 88 |
| — <i>ruficollis</i> | 112 | <i>Polistes Actæon</i> | 188 |
| — <i>rufitarsis</i> | 111 | — <i>Africana</i> | 188 |
| — <i>Saundersii</i> | 112 | — <i>Gallica</i> | 188 |
| — <i>Shuckardi</i> | 112 | — <i>nidulans</i> | 188 |
| — <i>sphærocercus</i> | 111 | <i>Polypodium Baromez</i> | 57 |
| — <i>Stevensianus</i> | 116 | <i>Polysperma</i> | 165 |
| — <i>thoracicus</i> | 111 | <i>Pomereulla monoica</i> | 95 |
| — <i>tibialis</i> | 111 | <i>Pontederia dilatata</i> | 272 |
| — <i>Turcius</i> | 111 | <i>Porcia</i> | 233 |
| <i>Pectiura vestita</i> | 167 | <i>Prangos pabularia</i> | 17, 18 |
| <i>Pediculus Apis</i> | 269 | <i>Procellaria pelagica</i> | 2 |
| — <i>Melittæ</i> | 270 | — <i>Wilsoni</i> | 2 |
| <i>Peganum Harmala</i> | 15 | <i>Procris lævicosta</i> | 200 |
| <i>Peltophyllum luteum</i> | 176 | <i>Prolifera</i> | 165 |
| <i>Pentadesma butyracea</i> | 214 | <i>Prosartes lanuginosa</i> | 48 |
| <i>Pentaplatarthrus paussoides</i> | 112 | — <i>Menziesii</i> | 48 |
| <i>Periploca calophylla</i> | 115 | <i>Prostenus ? hirsutus</i> | 201 |
| — <i>Hydaspidis</i> | 115 | <i>Protopterus</i> | 27 |
| <i>Perla abnormis</i> | 387 | <i>Pteris cœnenta</i> | 293 |
| — <i>arenosa</i> | 387 | <i>Pteromalus Acrotatus</i> | 261 |
| — <i>citronella</i> | 388 | — <i>Aglaua</i> | 263 |
| — <i>minima</i> | 388 | — <i>Amyntor</i> | 263 |
| — <i>vernalis</i> | 388 | — <i>Anaxenor</i> | 262 |
| <i>Petrosciadium cæspitosum</i> | 252 | — <i>Antho</i> | 262 |
| <i>Peziza Ledi</i> | 32 | — <i>Antorides</i> | 262 |
| <i>Peucedanum Wallichianum</i> | 253 | — <i>Aollius</i> | 262 |
| <i>Phæcordylis areolatus</i> | 220 | — <i>Bubaris</i> | 261 |
| <i>Phalanta</i> | 234 | — <i>Cercides</i> | 262 |
| <i>Phaylopsis glutinosa</i> | 64 | — <i>Ection</i> | 262 |
| <i>Phenice</i> | 84 | — <i>Learchus</i> | 262 |
| <i>Phenice fasciolata</i> | 84 | — <i>Naubolus</i> | 263 |
| — <i>fritillaris</i> | 84 | — <i>Nectocles</i> | 261 |
| — <i>stellulata</i> | 84 | — <i>Odites</i> | 261 |
| <i>Philodromus cespiticolens</i> | 132 | — <i>Orinus</i> | 263 |
| — <i>dispar</i> | 132 | — <i>Saravus</i> | 262 |
| — <i>oblongus</i> | 132 | — <i>Sunides</i> | 261 |
| <i>Pholeus phalangioides</i> | 133 | — <i>Tedanius</i> | 262 |
| <i>Phrynosoma cornutum</i> | 57 | — <i>Urgo</i> | 263 |
| <i>Phytocrene gigantea</i> | 240 | — <i>Xanthe</i> | 262 |
| <i>Pilularia globulifera</i> | 21 | <i>Pteronarcys Californicus</i> | 388 |
| <i>Pinus Mughus</i> | 89 | — <i>regalis</i> | 180, 370, 387 |

| | Page | | Page |
|--------------------------------|----------|---------------------------------|------------|
| Purpuricenus rubripennis | 128 | Solanum reptans | 110 |
| Rafflesiaceæ | 216 | Solenomelus Chilensis | 122 |
| Ranunculus acris | 269 | — punctatus | 122 |
| — pimpinelloides | 17 | Sonneratia acida | 166 |
| Rhizanthæe | 216 | Sparassus smaragdulus | 132 |
| Ribes Grossularia | 17 | Sparganium carinatum | 18 |
| — Himalense? | 17 | Spatangus cordatus | 185 |
| Rottlera tinctoria | 16 | — meridionalis | 134 |
| Rubus longifolius | 109 | — purpureus | 184 |
| Ruellia formosa | 64 | Spergula stricta | 222 |
| — littoralis | 64 | Sphæria alnea | 32 |
| — secunda | 64 | — arbuticola | 32 |
| Sagra Carbunculus | 128 | — Depazea | 32 |
| Sais | 349, 350 | — mesiota | 32 |
| Salisburia adiantifolia | 73 | — Ostruthii | 32 |
| Salomonina aphylla | 221 | — rhytismoides | 32 |
| Salticus coronatus | 132 | — scoriadea | 32 |
| — cupreus | 132 | Sphæroplea crispa | 165 |
| — gracilis | 132 | Sphaerosomus muricatus | 197 |
| Samara atropunctata | 327 | Spiranthes cernua | 190 |
| — aurantiaca | 327 | — gemmipara | 189 |
| — læta | 326, 327 | Spondylus varius | 134 |
| — undulata | 327 | Spongilla fluviatilis | 8, 36, 226 |
| — viridiflora | 327 | Staphylea Emodi | 17 |
| Santalum album | 169, 223 | Stemonitis pulchella | 32 |
| Sapium aquifolium | 41 | Stemoptera lilacina | 62 |
| Sapria | 179 | Stenaspidius | 366 |
| Sapria Himalayana | 217 | Stereocaulon denudatum | 32 |
| Sarcocordylis | 220 | — paschale | 32 |
| Sarcophyte | 209 | Stibara tetraspilota | 79 |
| Sarcostigma Roxburghii | 282 | — trilineata | 79 |
| Sarracenia purpurea | 92 | Stictis lichenicola | 32 |
| Saturnia Pavonia minor | 228 | Stictophyllum | 253 |
| Satyrium pallidum | 11 | Stilbospora macrosperma | 32 |
| Schaphespermum trilobum | 253 | Stilbum aurantiacum | 32 |
| Schizocercus nasicornis | 188 | Stillingia sebifera | 214 |
| — ochrostigma | 188 | Streptocaulon calophyllum | 115 |
| Schultesia pallens | 110 | Streptolirion volubile | 254 |
| Scladerma Lalage | 263 | Streptopus amplexifolius | 48 |
| Sclerotium roseum | 32 | — lanuginosus | 47 |
| Scolopendrium officinale | 119, 295 | — roseus | 47, 48 |
| Scotobius bullatus | 200 | — simplex | 48 |
| Scrophularia nodosa | 47 | Strobilanthus lupulina | 64 |
| Secale cornutum | 159 | Stylops | 368 |
| Seddera latifolia | 367 | Stylops aterrimus | 319 |
| Sedum Telephium | 89 | — melitte | 319 |
| Selinum Candollii | 253 | Swintonia floribunda | 283 |
| Semnopithecus cristatus | 235, 236 | Symphostemon | 123 |
| — halonifer | 235, 236 | Symphostemon flexuosum | 122 |
| — Maurus | 235 | — odoratissimum | 122 |
| Sericostoma | 368 | Synedra Ulna | 82 |
| Serioides atricapillus | 199 | Systole | 233 |
| — Reichii | 199 | Syzygites megalocarpus | 32 |
| Seseli Libanotis | 51 | Targionia hypophylla | 240 |
| Sison? tener | 252 | Tegenaria domestica | 132 |
| Sisyrinchium collinum | 123 | Tetranthera sebifera | 215 |
| — filiforme | 123 | Tetraonyx cinctus | 202 |
| — flexuosum | 122, 123 | — 7-guttatus | 202 |
| — Narcissoides | 122 | Tetrapteris acutifolia | 110 |
| — odoratissimum | 122 | — mutabilis | 109 |
| Solanum graveolens | 110 | Thelephora ferruginca | 32 |

| | Page | | Page |
|---|----------|--------------------------------------|--------|
| <i>Thelephora lactea</i> | 32 | <i>Typha angustifolia</i> | 42 |
| — <i>laevis</i> | 32 | <i>Uncaria procumbens</i> | 293 |
| <i>Theobroma Cacao</i> | 214 | <i>Uria lacrymans</i> | 21 |
| <i>Theridion benignum</i> | 66 | — <i>Troile</i> | 21 |
| — <i>denticulatum</i> | 132 | <i>Utricularia diantha</i> | 353 |
| — <i>reticulatum</i> | 132 | — <i>fasciculata</i> | 353 |
| — <i>signatum</i> | 132 | — <i>foveolata</i> | 351 |
| — <i>vernale</i> | 133 | — <i>nivea</i> | 352 |
| <i>Theridium</i> | 41 | — <i>polygaloides</i> | 351 |
| <i>Theridium pallidum</i> | 133 | — <i>pterosperma</i> | 352 |
| <i>Thesium</i> | 170 | — <i>racemosa</i> | 352 |
| <i>Thismia Brunonis</i> | 221, 329 | — <i>reticulata</i> | 352 |
| <i>Thomisus bifasciatus</i> | 132 | — <i>rosea</i> | 352 |
| — <i>brevipes</i> | 132 | — <i>uliginosa</i> | 351 |
| — <i>citreus</i> | 132 | <i>Uvularia amplexifolia</i> | 47 |
| <i>Thottea</i> | 180, 218 | — <i>calcarata</i> | 45 |
| <i>Thracia javanica</i> | 84 | — <i>Hamiltoniana</i> | 45 |
| — <i>nervosa</i> | 84 | — <i>Leschenaultiana</i> | 45 |
| — <i>sinuosa</i> | 84 | <i>Vallisneria spiralis</i> | 294 |
| <i>Thysanochilus</i> | 14 | <i>Vateria Indica</i> | 214 |
| <i>Tremoctopus violaceus</i> | 236, 237 | <i>Vaucheria</i> | 164 |
| <i>Trentepohlia pulchella</i> β . <i>chalybea</i> . | 360 | <i>Veronica agrestis</i> | 225 |
| <i>Trewia nudiflora</i> | 218 | — <i>arvensis</i> | 225 |
| <i>Tribostethes castaneus</i> | 198 | — <i>Cymbalaria</i> | 225 |
| <i>Trichocephalus acetabularis</i> | 237 | — <i>hederæfolia</i> | 225 |
| <i>Trichomanes radicans</i> | 326 | <i>Verrucaria margacea</i> | 32 |
| — <i>speciosum</i> | 179, 326 | <i>Vesiculifera composita</i> | 166 |
| <i>Trifolium repens</i> | 119 | <i>Vicarya</i> | 367 |
| — <i>resupinatum</i> | 80 | <i>Villarsia Nymphoides</i> | 18 |
| <i>Tripladenia Cunninghamii</i> | 46 | <i>Viola</i> | 297 |
| <i>Triplosporite</i> | 345 | <i>Viola canina</i> | 382 |
| <i>Triuris</i> | 176 | — <i>flavicornis</i> | 382 |
| <i>Triuris hyalina</i> | 96 | — <i>sebifera</i> | 215 |
| <i>Trochoideus Americanus</i> | 110, 111 | <i>Walckenaera</i> | 41 |
| — <i>cruciatus</i> | 110 | <i>Xenodochnus carbonarius</i> | 32 |
| — <i>Dalmanni</i> | 110 | <i>Zamia furfuracea</i> | 54, 55 |
| — <i>Desjardinsii</i> | 110 | — <i>pumila</i> | 54, 55 |
| — <i>Hopei</i> | 110 | <i>Zeugma vittata</i> | 84 |
| <i>Tropæolum majus</i> | 124 | <i>Zonopterus flavitarsis</i> | 128 |
| <i>Trox bullatus</i> | 197 | <i>Zygnema</i> | 164 |
| — <i>lachrymosus</i> | 197 | <i>Zygophyllum obtusum</i> | 367 |
| — <i>trisulcatus</i> | 197 | — <i>simplex</i> | 367 |
| <i>Tyndaridea</i> | 164 | | |

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