NOVEMBER 1. Price 3s.

(12)

JOURNAL OF THE PROCEEDINGS OF THE LINNEAN SOCIETY.

VOL. I. No. 3.

CONTENTS.

Page

I. Proceedings from March 4th, 1856, to June 17th, 1856. xvii
Additions to the Library lvii
Donations to the Museum lxiv

II. Zoological Papers.

1. Catalogue of the Homopterous Insects collected at Singapore and Malacca by Mr. A. R. WALLACE, with Descriptions of New Species. By FRANCIS WALKER, Esq., F.L.S. &c. (With Two Plates.) 97
2. On the Occurrence of *Sepia biserialis* in Cornwall. By JONATHAN COUCH, Esq., F.L.S. &c. 100
3. Notice of the "Borer," a Caterpillar very injurious to the Sugar-Cane. By J. O. WESTWOOD, Esq., F.L.S. &c. . . 102
4. Notice of a Specimen of Insect-wax from China. By DANIEL HANBURY, Esq., F.L.S. &c. 103
5. Note on Insects producing Wax from Port Natal and China. By J. O. WESTWOOD, Esq., F.L.S. &c. 104
6. Catalogue of the Dipterous Insects collected at Sarawak, Borneo, by Mr. A. R. WALLACE, with Descriptions of New Species. By FRANCIS WALKER, Esq., F.L.S. &c. . . . 105
7. On a New Organ in Insects. By JOHN BRAXTON HICKS, Esq., M.D. Lond., F.L.S. &c. (With a Plate.) 136

III. Botanical Papers.

1. Notes on *Loganiaceæ*. By GEORGE BENTHAM, Esq., F.L.S. &c. 97
2. On some Collections of Arctic Plants, chiefly made by Dr. Lyall, Dr. Anderson, Herr Miertsching, and Mr. Rae, during the Expeditions in search of Sir John Franklin, under Sir John Richardson, Sir Edward Belcher, and Sir Robert M'Clure. By J. D. HOOKER, Esq., M.D., F.R.S., F.L.S. &c. 114
3. On the Botany of Raoul Island, one of the Kermadec group in the South Pacific Ocean. By J. D. HOOKER, Esq., M.D., F.R.S., F.L.S. &c. 125
4. Note on *Obolaria virginica*, L. By ASA GRAY, M.D., F.M.L.S. &c. 129
5. On the Action of Sea-water on the Germination of Seeds. By CHARLES DARWIN, Esq., Vice-Pres. R.S., F.L.S. &c. . . 130
6. On the Vitality of Seeds after prolonged Submersion in the Sea. By JAMES SALTER, Esq., M.B., F.L.S. &c. . . . 140
7. Note on the Development of Fungi upon Patna Opium. By the Rev. M. J. BERKELEY, M.A., F.L.S. &c. 143

LONDON:
LONGMAN, BROWN, GREEN AND LONGMANS,
AND
WILLIAMS AND NORGATE.
1856.

March 4th, 1856.

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

Read, a "Note on some Larvæ voided by Children," by Edward Newman, Esq., F.L.S.

Read also, a "Notice on the occurrence of *Sepia biserialis* in Cornwall," by Jonathan Couch, Esq., F.L.S. (See "Zoological Proceedings," p. 99.)

Read further, a Memoir "On the Development of the Ovule of *Santalum album*, with some remarks on the phænomena of impregnation in Plants generally;" by Arthur Henfrey, Esq., F.R.S., F.L.S. &c. (See "Transactions," vol. xxii. p. 69.)

March 18th, 1856.

W. Yarrell, Esq., V.P., in the Chair.

Henry Adams, Esq., was elected a Fellow.

Mr. Longmuir, jun., exhibited a photograph of *Numenius borealis*, shot in Kincardineshire in September last.

Read, "Remarks on the Influence of the Sexual Organ in modifying external characters in Animals," by William Yarrell, Esq., V.P.L.S. &c. (See "Zoological Proceedings," p. 76.)

Read also, a Paper entitled "Remarks on the covering of the Seed in *Clusiaceæ*, *Magnoliaceæ*, &c., and on the development of the raphe in general;" by John Miers, Esq., F.R.S., F.L.S. &c. (See "Transactions," vol. xxii. p. 81.)

April 1st, 1856.

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

James Alexander Brewer, Esq., and Thomas Hawkes Tanner, Esq., M.D., were elected Fellows.

Read, a "Note on the recent Discoveries in regard to the Microgonidia of Freshwater Algæ;" by the Rev. M. J. Berkeley, M.A., F.L.S. &c. (See "Botanical Proceedings," p. 145.)

Read also, a "Note on some collections of Arctic Plants, chiefly made by Dr. Lyall, Dr. Anderson, Herr Miertsching, and Mr. Rae, during the Expeditions in search of Sir John Franklin;" by J. D.

Hooker, Esq., M.D., F.R.S., F.L.S. &c. (See "Botanical Proceedings," p. 114.)

Read further, a Paper "On the Botany of Raoul Island, one of the Kermadec Group, in the South Pacific Ocean;" by J. D. Hooker, Esq., M.D., F.R.S., F.L.S. &c. (See "Botanical Proceedings," p. 125.)

April 15th, 1856.

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

Frederick Currey, Esq., M.A., was elected a Fellow.

Read, an Extract of a Letter from R. Spruce, Esq., addressed to G. Bentham, Esq., F.L.S., giving an account of Tarapota in Peru, from whence the Letter is dated, and of its vegetation.

Read also, a "Note on *Obolaria Virginica*, L.; by Asa Gray, M.D., F.M.L.S. &c. (See "Botanical Proceedings," p. 129.)

Read also, a "Note on the Chinese Insect-wax," by Daniel Hanbury, Esq., F.L.S. (See "Zoological Proceedings," p. 103.)

Read also, a "Note on Wax-producing Insects from Port Natal and China," by J. O. Westwood, Esq., F.L.S. &c. (See "Zoological Proceedings," p. 103.)

Read further, the Commencement of a Memoir "On several instances of the anomalous development of the Raphe in Seeds, and the probable causes of such deviations from the usual course of structure, especially in reference to *Stemonurus* (*Urandra* of Thwaites);" by John Miers, Esq., F.R.S., F.L.S. &c. (See "Transactions," vol. xxii. p. 97.)

May 6th, 1856.

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

John Samuel Gaskoin, Esq., F.L.S., exhibited some of the so-called "Jumping-seeds," described by Sir W. J. Hooker and J. O. Westwood, Esq., in the "Kew Journal of Botany;" the motion of which is due to the larva of a small insect enclosed in the seed.

Read, a Paper "On the Action of Sea-water on the Germination of Seeds;" by Charles Darwin, Esq., F.R.S., F.L.S. &c. (See "Botanical Proceedings," p. 130.)

Read also, a Note "On the Vitality of Seeds after prolonged submersion in the Sea;" by S. James A. Salter, Esq., M.B. Lond., F.L.S. &c. (See "Botanical Proceedings," p. 140.)

Read further, a Paper "On the Homopterous Insects of Singapore and Malacca;" by Francis Walker, Esq., F.L.S. &c. (See "Zoological Proceedings," p. 82.)

May 24th, 1856.

Anniversary Meeting.

Thomas Bell, Esq., 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 with the following Address:—

GENTLEMEN,

In reviewing the events of the past year, in connexion with the objects of the Linnean Society, there are, perhaps, few striking facts to record of particular interest to the Society itself, or bearing, in any marked degree, upon the advance of Natural History in general. There has been no very important discovery enunciated, of a character to impugn former theories or systems, or to establish new ones; no new foundation or institution inaugurated, by which Natural Science will be materially extended or diffused. But, on the other hand, the general progress of this branch of knowledge has been steadily going on; and, if the year which has elapsed since I last addressed you may not hereafter constitute one of those bright, red-letter periods which will live in history as the turning-point of some important department of discovery, yet the accumulation of new facts, tending to the elucidation of various doubtful questions, and the settlement of previously debated theories, will be found sufficient at least to preclude any feeling of dissatisfaction or disappointment. Within our own sphere, I may appeal to the numerous valuable papers which have been read at our meetings, and have already been, or are about to be, published in our Transactions and Proceedings, and to the continued, perhaps I may say the increased interest of our meetings—to show that our energies are at least undiminished; and our efficacy, as the principal medium of the advancement of natural science in this country, unimpaired. The general appreciation of the character of the Society in this point of view, is evidenced by

the almost unprecedented number of naturalists who have been enrolled in our list of Fellows during the present session,—amounting to no fewer than 20,—besides those whose certificates are still suspended.

It is with much regret and sorrow that I turn to the painful side of the account, and find it my duty to refer to the annual diminution of our numbers by death, besides several who have, from various causes, withdrawn from us; but although there were many, amongst those who have been removed from us by the inevitable fate of man, whose loss as good men and most valuable members of society, and some of them ardent cultivators of natural science, we must deeply deplore,—and I have myself to mourn the loss of one who was the constant and faithful friend of nearly fifty years,—yet few of those of whom we have been thus deprived had occupied a conspicuous place in the scientific world, or contributed in particular to our own Transactions, or taken any active part in the affairs of the Society.

At the last anniversary I had the pleasure of announcing to you, that the Council had unanimously resolved upon a modification of your publications, which should afford the opportunity of a more extensive and more speedy issue of such papers, read at your meetings, as might not require to appear in the quarto form of your Transactions. This resolution has now been carried into effect, as far as the brief period which has since elapsed has permitted. It would be premature as yet to declare, that all the anticipations of advantage from this design have been realized. It will require at least another year to ascertain its full results, and whether the present plan shall be exactly followed, or whether any modification of it may prove desirable. I may, however, be permitted even now to state, that I have not heard one word of dissatisfaction expressed by any one; but, on the contrary, I have received from many quarters the assurance of the cordial welcome with which the new publication has been received, and of the general approval of the form in which it has been issued. The only condition with which I have heard this approval connected is, that the quarto Transactions should never be infringed upon by its humbler and less pretentious handmaid. I need not say, that in this view I most heartily concur; nor could I feel the satisfaction which I now do at the present working and future prospects of the Journal of our Proceedings, did I not confidently expect that it will not interfere with the regular appearance, or diminish the value and importance of those Transactions, which have been so long identified with the

Society, and to which its past and present prestige has been so mainly due. There will, I sincerely believe, be material enough for both forms. Papers of great value will, I doubt not, continue to be communicated, of a nature which requires speedy publication, without the necessity of quarto illustrations. Exclusive of these two considerations, however, it must be confessed that there is some difficulty in laying down any very definite rule as to the nature of those papers requiring each particular form of publication respectively, and it must be left to the consideration of the Council to determine the question in the case of each individual paper. With all these difficulties, the circumstance of bringing home to every Fellow of the Society, within reach of the post, an important portion of our Transactions, at stated and not distant periods, without trouble or expense to the recipients, has hitherto been most satisfactory, and will, I am confident, tend, when the system is rendered fully effective by experience and habit, to increase the numbers and importance of the Society, by bringing into our ranks many zealous cultivators of natural history, who, from their remote residence, would not otherwise have been induced to join us. With regard to one element of the plan, the sale of the Journal out of the Society, I have to state, that comparatively few of the separate parts of Zoology and Botany have been disposed of; the sale of the entire work has been somewhat greater.

I cannot take leave of this subject without adverting to the effective manner in which the new scheme has been commenced. For this, and for innumerable other good offices,—I may say, for the general conduct of the affairs of the Society,—we are deeply indebted to the talent, the devoted zeal, and the disinterested labours of our excellent and esteemed Secretary. I cannot, in his presence, enlarge on the obligations which we are constantly and unceasingly under to Mr. Bennett. It would, I know, be painful to him, and you are all too well acquainted with his great services, —requited only by his own sense of usefulness, and by our gratitude, which I know he values,—to require that they should be dwelt upon by me.

It is with much pleasure also, and with sincere acknowledgement, that I feel called on to advert to the able and cheerful manner in which he has been seconded in this work by Mr. Kippist. Without such zeal and ability it would have been impossible to have commenced and carried out a new and untried plan such as this.

The only drawback to the satisfaction which we must feel at the utility and advantages on which I have been dwelling, is the considerable expense which, in its outset, must necessarily be incurred; and on this subject I cannot but observe, that without some such relief from our present expenditure as we have been hopefully anticipating, from a prospect of house-accommodation to which I shall presently more particularly ask your attention, I cannot see how the expenses of the Journal are to be met, unless the advantages which its free distribution involves should prove a sufficient stimulus to many naturalists to enter the Society. I have, however, one circumstance to state, which is, so far as it goes, encouraging, and that is, that when the whole expenses of the Journal, as far as it is now published, are paid, the balance of our annual receipts and expenditure, small though it be, is in favour of the Society.

This result was not, I believe, anticipated; on the contrary, it was fully expected that we should have had to call for extensive assistance for the issue of even the first part. I should not, perhaps, have thought it necessary to advert at all to the state of the finances but for this circumstance, as the statement of the income and expenditure is now before you; but as I have referred to the subject, I cannot but congratulate the Society upon the favourable results of the audit, and especially on the large sum which appears in the item of admission-fees, and the small comparative number of new compositions. The latter source of income has a good temporary appearance on our books; but when it is recollected that the average term of membership is thirty-six years, the annual subscription is obviously the more advantageous to the Society.

I have sometimes thought, that, constituted as we are, and with aims and objects so noble, we have perhaps too much restricted our labours to the conventional routine of our meetings and the publication of our Transactions. I hope I shall not be misunderstood here. I should be the last to ask for, or to sanction any, even the slightest encroachment upon those long and wisely established means of carrying out our objects. But there may be other methods of usefulness, by which our sphere of operation may be enlarged, by more extensive association with the outer world, if I may so speak, and by becoming the centre of the interests of Natural History throughout the country. And on reflecting upon the various directions in which the Linnean Society

may thus legitimately exercise its influence, there is one which appears to me at the present moment deserving of some consideration.

When the Society was first instituted, its objects, as you will find them expressly stated in our Charter, were "for the cultivation of the science of Natural History in all its branches, and *more especially* of the Natural History of Great Britain and Ireland." Now, although it is very certain that the publication of numerous periodical works, having this particular design in view, has rendered it less necessary for the Society to expend its resources upon the mere local Flora and Fauna of various districts of our own country, whilst the rapid advance of zoological and botanical science has rendered the prosecution of the higher branches our primary aim,—and I need only appeal to our publications to show the extent to which this purpose has been, and still continues to be, carried out,—it has occurred to me that in one particular, hitherto unattempted, we may, without entrenching upon our higher duties, assist materially in increasing and extending the knowledge of the natural products of the country.

It was the observation of the most accomplished and fascinating writer on local natural history that England has ever seen, that if the natural productions of each district had their local historian, our knowledge of the natural history of the country would become more perfect than by any other means; and every one knows how beautifully and how perfectly the author of that sentiment carried it into practice. It is indeed the only means by which this end can be obtained; and it is therefore with much pleasure that I advert to the numerous local institutions, now springing up in various directions, in some instances in connexion with mechanics' institutes, with schools, or other establishments for the education or instruction of the middle classes, the principal design of which is to allocate in a provincial museum the natural products of the county or of a more circumscribed district, and frequently associated with a collection of local antiquities. I have thought it might be useful to point out some circumstances which would conduce to the proper design of such institutions, and at the same time render them the means of greatly extending our acquaintance with indigenous zoology and botany. The primary object then of these institutions should be the collection and preservation of the animals, plants, and palæontological specimens which are found in the district; and to this should be added a full and accurate record of their habitats and of any other inter-

esting circumstances connected with them, whether of soil, of geological position, of meteorological phenomena, the period of the year when obtained, peculiarities in their habits, and in short any facts which may bear upon their history. If in addition to this first consideration it happens that instruction is to be given, by lectures or other means, in the study of Natural History generally, a typical collection may be added, which should be considered as entirely distinct from the local one, and as having a totally different object. Upon this, however, it is not my purpose to dwell at present, further than to call attention to the plan which has been so energetically and intelligently carried out by my friend Professor Henslow, whose exertions in this behalf are already well known and appreciated. I would refer particularly to the Ipswich Museum as a practical example of what may be done in this respect, and to the lists which Mr. Henslow has furnished to the British Association, and which are probably now before you.—To recur to the local collections. My friend Professor Phillips, in a recent address to the Malvern Field-Naturalists' Club, alluding to the formation of such a museum, has very strongly, and with great propriety urged the rejection, by an absolute rule, of all offers of specimens excepting such as are connected with the locality. The consequence of the neglect of this salutary caution is the accumulation of masses of specimens from all parts of the world, many of which might be available if suitably placed, but are a mere useless incumbrance in a local museum. They not only occupy space which might be more beneficially employed, but they take off the attention and waste the time of those who resort to the museum for information, and of those whose duty it is to take care of the contents and keep the records.

Now, it has appeared to me that in many instances the utility of such collections might be extended beyond the bounds of the locality in which they are placed, by the communication to the Linnean Society (by reports either periodical or at indefinite times) of their new acquisitions, or of the observations recorded by the curators or naturalists respectively attached to them in the manner which I have before recommended. These, or selections from them, might be printed, when considered of sufficient value, in our Journal; and thus many an interesting fact would be permanently recorded and made universally known, which would otherwise be lost; and great encouragement would be held out to many a young naturalist in the country, by being placed in such a relation to this Society.

A circumstance has recently occurred in reference to the most important and interesting portion of our property, the Linnean Collections, of which I think it may be agreeable to you to be informed. It was proposed in the Council that a Committee should be appointed to examine into the present condition of those collections,—as to what they respectively consist of,—where they are now respectively deposited,—in what state they now are, and whether any suggestions may occur to the Committee with reference to their preservation and exhibition to the Fellows of the Society and the visitors. The Committee consisted of the President, the Secretary, Mr. Bentham, and Mr. Wilson Saunders, and they afterwards obtained the assistance of Mr. Hanley with reference to the Shells, and of Mr. Yarrell to the Fishes.

It has appeared to me that this subject was a perfectly legitimate one to form an element in my address, as it cannot but be very interesting to all who have the character of the Society at heart, and are anxious for the preservation and proper use of the invaluable collections in question. Instead, therefore, of merely embodying in my address a brief abstract of the acts of the Committee, as I at first intended, I will, with your permission, read the Report which they delivered to the Council, *in extenso*.

"*Report presented to the Council, May* 6, 1856.

"The Committee of Council, consisting of the President, Mr. Bentham, Mr. Wilson Saunders, and the Secretary, appointed on the 1st of April, 1856, 'to examine the Books, Manuscripts and Collections, forming the Library and Museum of Linnæus, and to report to the Council

"'What they respectively consist of,

"'Where they are now respectively deposited,

"'In what state they are respectively, and

"'Whether any suggestions may occur to the Committee with reference to their preservation and exhibition to the Fellows of the Society and Visitors,' report as follows:—

"The Committee have held several meetings, viz. on the 7th, 10th and 15th of April, and on the 1st of May, and carefully examined into the several matters referred to them. The result of their investigations may best be stated under the general heads of Books, Manuscripts, Plants, Insects, Shells, Fishes, and Miscellaneous Zoological Specimens.

"1. *Books.*

"The Books are for the most part placed on the shelves of the

General Library of the Society. They are all marked in the hand of the late Sir James Edward Smith as derived 'E Bibliothecâ Linnæi propriâ.' There is no separate catalogue of them; but they are entered in the General Catalogue of the Library, with the exception of a few miscellaneous volumes not relating to natural history, chiefly medical theses.

"The remaining portion of the Books, which must be regarded as the most important, as containing MS. notes by Linnæus himself, and as connected with his Herbarium and other collections, are contained in a case placed in the meeting-room near the Linnean Herbarium.

"The Committee consider it to be highly desirable that the Natural-History Library of Linnæus should be separated from the rest of the Society's books:

"That a list should be made of the volumes so separated:

"That for the future these volumes be not lent out to the Fellows without the special permission of the Council.

"2. *Manuscripts.*

"The Manuscripts are contained in a large chest in the south-western room of the second floor of the Society's house, and are in an excellent state of preservation. They are at present tied up in bundles; but the Committee consider it desirable that, when the Society is able to afford it, the correspondence should be mounted on guards and bound in volumes.

"3. *Plants.*

"The Herbarium is contained in three upright narrow cabinets formerly belonging to Linnæus, and in which it has remained up to the present time: these cabinets are placed in the meeting-room of the Society. The plants are in excellent condition, and well protected in conformity with directions given by the Council on the recommendation of a committee in 1836. The Committee recommend that these cabinets should be conspicuously distinguished by means of a framework or in some other way.

"4. *Insects.*

"The Insects are in a good and secure cabinet placed in the south-western room of the second floor, and are in an excellent state of preservation. While in the possession of the first President of the Society, the late Sir J. E. Smith, a number of additional insects were incorporated with those of Linnæus; and the

Committee recommend that, as soon as the opportunity offers, these insects be separated from the Linnean, and the two collections be arranged in distinct parts of the cabinet.

"5. *Shells.*

"In the examination of the collection of Shells the Committee requested and obtained the valuable assistance of Mr. Hanley.

"The Shells are contained in a distinct cabinet placed in the same room with the manuscripts and insects. The Committee regret to state that serious injury has resulted to the Linnean collection of shells from the careless mode in which they have been occasionally referred to by visitors, and from the attempt of a former subcurator to arrange them according to a modern method. Many of the specimens have thus been displaced from their original receptacles, and other difficulties have been created to the complete identification of the Linnean species, and their discrimination from the specimens added by Sir J. E. Smith.

"On Mr. Hanley's recommendation, the Committee resolved that it is highly desirable

"That the Linnean collection should, as far as possible, be separated from the specimens subsequently added:

"That all the specimens which can be undoubtedly identified as Linnean should be attached to boards with the Linnean name added, and any useful memoranda relating to them.

"Mr. Hanley kindly offered his assistance in carrying out these recommendations, and stated it as his opinion that the present cabinet would be sufficient for the purpose, and that very little expense would be incurred.

"6. *Fishes.*

"With the valuable assistance of Mr. Yarrell, who consented to join the Committee for the purpose, the Committee proceeded to examine the collection of Fishes, which are at present contained in the drawers of a cabinet in the large south attic, and consist of half-skins pasted upon paper, and generally in fair condition. Many of these undoubtedly belonged to Linnæus; some appear to have formed part of the collections of his son; and others were probably added by Sir J. E. Smith.

"Mr. Yarrell recommended that they should be pasted on cardboard in such a manner as to retain all the original papers and the writing upon them; and the Committee resolved

"That it be recommended to the Council to accept the kind offer of Mr. Yarrell to superintend the operation:

"That the specimens when so laid down be systematically arranged, and placed in drawers in a more easily accessible situation.

"7. *Miscellaneous Zoological Specimens.*

"These chiefly consist of a few Reptiles and Crustacea, contained in some of the drawers of the shell-cabinet, or in those of the cabinet of the large attic, which the President undertook to examine, and to separate whatever can be identified as Linnean.

"While examining the miscellaneous specimens in the south attic, the Committee observed several bundles of Swedish academical announcements, and anatomical and other dissertations not immediately connected with natural history. They recommend that these parcels be securely placed in brown-paper covers, labelled with a general statement of their contents. Twelve copies of Broussonnet's 'Descriptiones et Icones Piscium,' which are duplicates to the Library, are recommended to be sold.

"In the Linnean shell-cabinet the Committee find a large number of bad or injured specimens of Lichens on Stones, chiefly British, and forming no part of the Linnean Collection. These appear to be utterly worthless, and the Committee recommend that they be thrown away."

It cannot but be most gratifying to learn that these collections, to which so peculiar a value attaches, should have been found by the Committee in so perfect a state. It was indeed far beyond the expectations of those who were deputed to examine them.

I have now, Gentlemen, to call your attention to a matter to which I have already alluded, and which, if our present anticipations are fulfilled, must be productive of the most advantageous results to this Society, and I may add, ultimately to the advance of natural knowledge in this country. You are all too well aware that, while other Societies formed for the cultivation of various branches of science, the Royal, the Geological, the Astronomical, and the Geographical Societies, had received, one after another, the substantial support of the Government, in having commodious apartments assigned to them,—three of them being located in that great central official building, Somerset House,—the Linnean Society, the representative of the natural-history sciences in this country, the oldest offspring of the great parent of British science, and certainly not the least useful and important of such bodies, remained unaided and unsanctioned by the authorities of the Government, dependent wholly upon its own resources, shackled

and crippled by the expenses of rent and other requirements, from which others were exempt. It is not necessary for me now to inquire into the causes of this neglect. It were vain now to search for the occasion of the remarkable fact, that while we had for our Presidents in succession, a noble Duke of great Parliamentary influence—another noble Lord, whose connexions have been closely associated with the Government at various times—a venerable Prelate, the brother of a cabinet minister,—no favourable reply could be obtained to our applications for house-accommodation. Such, however, was the case; and we were obliged to toil on, encumbered with a debt, incurred, not by foolish or unnecessary extravagance, but by the acquisition of a priceless library and collection of natural objects, by which circumstance we became the depositary of a sacred and most interesting trust, and while others were, so to speak, basking in the sunshine of official favour, we were thrown upon our own curtailed and inadequate resources. But, Gentlemen, we have no reason to despond. What we have done, we have done for ourselves; and we may well look with complacency upon our acquisitions, upon our publications, upon our acknowledged usefulness, and upon the character we hold in this and in every other country where natural knowledge is cultivated, and feel an honest pride in the reflection that we have done all this unpatronized and unassisted.

Affairs were in this anomalous position when, some years since, a scheme, emanating from several Fellows of the Royal Society, and Members of the Philosophical Club of that Society, was proposed and repeatedly discussed at the meetings of the Club, the object of which was to bring about the juxtaposition of scientific Societies, in some commodious and suitable building, worthy of British science, to be provided by the country for that purpose. The only principle upon which such a design could either with justice or with any probability of success be carried out is, *juxtaposition, but with separate property and independent action*—and this was the principle which I have always advocated, and the only one to which my humble sanction could ever have been given.

Such was the object of a movement which, after many alternations of energy and repose, has at length obtained a partial recognition of the great principle which it was its object to promote. It would be taking up your time unnecessarily were I to retrace all the intermediate steps which have been taken, and the varying phases which the question has assumed. I would however state, that the deputation which waited upon Lord Aberdeen, when his

lordship was Prime Minister, received from him the assurance of his entire concurrence in the object; and on the particular claims of the Linnean Society being strongly brought before him, he at once acknowledged the justice of those claims, and the anomalous nature of our position. From this time the object of the movement assumed a more definite form; and as it would be impossible to obtain separate accommodation in any one building for all the Societies which profess to cultivate every minor branch of science, the claims were limited to those chartered Societies which might be considered as representing the larger departments of scientific research. Within this category would be included the Royal, the Linnean, the Geological, the Astronomical, and the Chemical Societies. This definite object was very strongly urged upon the late Sir William Molesworth, at an interview with which we were favoured by him, and his parting words were, "Well! it appears quite clear that those five Societies ought to be accommodated"—and yet, a few days afterwards, in the House of Commons, that gentleman stated, in answer to a question put to him, that it was only those Societies which were located in Somerset House which were to be provided for. And this has, up to nearly the present moment, been the difficulty. Science has not been generally recognized for its own sake, but only as its accommodation could be provided for at the least possible expense or trouble to the Government, and for the sake of obtaining possession of the apartments occupied by the Societies in Somerset House. Here then the Linneans were again ignored!

At length it was announced that Burlington House was purchased by the Government for the express purpose of affording ample accommodation to science and literature, within the walls of one great building. A deputation then waited upon Lord Palmerston, who readily recognized the claims of the five Societies; and without pledging himself to any final adjustment of the question, expressed with his usual urbanity his general concurrence with the principle urged by the deputation.

From some cause or other which I have never fully understood, the Royal Society, upon whose agency the rest of the Societies depended, failed to press their advantage, and the University of London not only applied successfully for the accommodation which had been promised to the scientific Societies, but actually took and still holds possession of a portion of the house. But more recently a strong representation was made by Lord Wrottesley to the Government on the part of the five Societies, and a meeting

was held at the rooms of the Royal Society of the representatives of those bodies. A letter was there read from Mr. Wilson, the Secretary to the Treasury, in reply to that of Lord Wrottesley, but again recognizing only the Societies which are located in Somerset House, and appointing a meeting of their representatives at the Treasury. I must here inform you, that since the eastern detached wing of Burlington House has been occupied by the University, there is only room for three Societies, at the most, in the main building and the western wing. To the surprise of the gentlemen present, Mr. Wilson assured them that the Government did not wish to turn them out of Somerset House, where they might still remain if they preferred it. Accordingly the Society of Antiquaries, the Geological, and the Astronomical Societies expressed their desire to remain as they were, and the Royal only expressed their readiness to move into the new quarters. I considered it my duty to inform your Council of these circumstances, and as the events were now following each other too rapidly for me to communicate every successive step to them, and receive their sanction, they came to a resolution,—"That it is the opinion of the Council that it is highly desirable to obtain rooms in Burlington House, and that the President be requested to take such steps as may appear to him best calculated to secure that object." I accordingly acted upon this resolution. On receiving immediately afterwards an intimation that the officers of the Royal Society had a fresh appointment to meet Mr. Wilson, and wished to know whether the Linnean Society and the Chemical Society would be ready to accept apartments in Burlington House with the Royal, I immediately sought an interview with the President of the Chemical Society, who I found had received a similar *carte blanche* from his Council to that with which I had been favoured, and we sent in our cordial acquiescence in the proposed union.

I have now, Gentlemen, merely to record so much of the result of the interview between Lord Wrottesley the President, Col. Sabine the Treasurer, and Dr. Sharpey the Senior Secretary of the Royal Society, with Mr. Wilson, as bears upon our prospects. I am not at liberty, as I conceive, to say more than was communicated to me in the presence of others; and this simply amounts to the statement on the part of the officers of the Royal Society that the Linnean and Chemical Societies were most willing to accompany the Royal to Burlington House, and the distinct expression of Mr. Wilson's readiness to accede to this arrangement. I have waited, as you will readily believe, with intense anxiety for a com-

munication from Lord Wrottesley, to the effect that the Treasury minute has been passed, recognizing and confirming Mr. Wilson's expressed accordance with our desire.

I had last evening completed writing this address, when Dr. Sharpey, the Secretary of the Royal Society, called upon me from Lord Wrottesley, bringing with him the official Treasury minute, which I shall have the extreme satisfaction of reading to you, confirming the appropriation of Burlington House to the Royal Society, on condition of their providing suitable accommodation for the Linnean and Chemical Societies. You will find one or two points mentioned which will require some explanation, and this I shall be enabled to give you.

"Treasury Chambers, May 22, 1856.

"My Lord,—I am directed by the Lords Commissioners of Her Majesty's Treasury to acquaint your Lordship, with reference to the views set forth in your letter to the Duke of Argyle on the 30th ult., which has been laid before the Board, that Her Majesty's Government are not at present in a position to enable them to state any definite views with respect to the project for the juxtaposition of the principal scientific Societies in a building to be erected in a convenient and central locality. I have to state that their Lordships are, however, prepared so far to concede to the views advanced by your Lordship on behalf of a large number of persons connected with Science, as to allow the temporary location of the Linnean and Chemical Societies in conjunction with the Royal Society in the present building of Burlington House, on the following conditions, viz. :—

"1st. That the removal of the Royal Society from Somerset House shall not prejudice the position of the other Societies located in that building, in regard to the terms on which they are permitted to occupy their present apartments.

"2ndly. That the Royal Society shall be put in possession of the main building of Burlington House, on the understanding that they will, in communication with the Linnean and Chemical Societies, assign suitable accommodation therein for those bodies.

"3rdly. A common library to be formed for the use of the three Societies, on the understanding that suitable arrangements shall be made for the admission thereto, for the purposes of reference and study, of men of letters and science, on orders given by Fellows of the three Societies.

"4thly. The Societies to be allowed the use of the Hall, which it is proposed to construct in the west wing of Burlington House, at such times as it may not be required by the Senate of the Uni-

versity of London, it being distinctly understood that this permission is to be so exercised as not in any way to interfere with the convenience of the University.

"5thly. The collection of portraits belonging to the Royal Society to be hung on the walls of the proposed Hall, and to be open to the inspection of the public under such regulations as may be convenient, and subject especially to the provisions in the previous clause.

"6thly. That the adoption of this temporary arrangement shall not in any respect be held to weaken the claims of the Royal Society to permanent accommodation.

"I have the honour to be, &c. &c.,

(Signed) "JAMES WILSON."

"*To the President of the Royal Society.*"

The points in this letter to which I have alluded as requiring explanation, are the temporary character of the occupation, and the union of the libraries. With respect to the first, nothing more is intended than that, upon the completion of the larger building, which is as yet only contemplated, our Society, in common with others engaged in the pursuits of science, will have ample accommodation in that building. The intention of the passage which refers to the union of the libraries is understood to be the admission to each library, for the purposes of consultation and perusal, of all the Members of the three Societies; the privilege of borrowing the books being restricted, as at present, to the Members of the Society to which the books respectively belong.

I cannot take leave of this subject and close my address without expressing my sense of the sincerity and earnestness with which the authorities of the Royal Society have advocated our cause, and the anxious desire they have expressed to commence with us the practical development of the great principle of juxtaposition. To us the success of the present effort is all-important. The immunity from rent, the close association with our brethren in scientific pursuits, the approximation of our libraries, and, let me add, the prestige attached to such a locality, must act as a powerful aid to our already growing prosperity, and enable us to carry out, unencumbered, our great mission,—the advancement of natural science, with all its advantages, the amelioration of the condition of man, the elevation of his character, intellectual and moral, and especially the promotion of the glory of the Creator, by extending the knowledge of his works.

OBITUARY NOTICES.

The Secretary then proceeded to read the following obituary notices of deceased *Fellows*:—

John Adamson, Esq., F.S.A., F.R.G.S. &c., was descended from a family of respectability in the county of Durham. His father, Cuthbert Adamson, in 1773, accompanied the Hon. Capt. Phipps as second Lieutenant of the *Racehorse*, in his celebrated Voyage of Discovery towards the North Pole; and was afterwards stationed at Newcastle in charge of the impress service of that port. Mr. Adamson was born in Gateshead on the 13th of September 1787, and after receiving his education at the Grammar School of Newcastle, was sent to Lisbon, where his elder brother had been for some time established in business as a merchant. The unsettled aspect of public affairs, however, induced him to return to England, and completely altered his views in life. He was soon after articled to Mr. Thomas Davidson, an eminent legal practitioner, and Clerk of the Peace for the county of Northumberland. In 1811, at the age of 24, he was so fortunate as to obtain the appointment of Under-Sheriff of Newcastle, which office he retained for five-and-twenty years; and the advantageous position which he had thus early attained laid the foundation for his subsequent success in his profession. From his youth he cultivated a taste for literature, antiquities, and natural history. He became a Member of the Literary and Philosophical Society of Newcastle in 1811, and was one of its Secretaries from 1825 to the time of his death. His taste for Portuguese literature, acquired during his brief visit to that country in 1803, was evinced by the publication in 1808 of a translation of Nicola Luiz's tragedy of Donna Ignez de Castro; and still more strongly by his 'Memoirs of the Life and Writings of Camoens,' published in 1820; which obtained for him the title of a Corresponding Member of the Academy of Sciences at Lisbon, and induced the Queen of Portugal, at a subsequent period, to confer upon him the Orders of Knighthood of Christ, and of the Tower and Sword. In 1842 he commenced a work entitled 'Lusitania Illustrata; or Notices on the History, Antiquities, Literature, &c. of Portugal,' of which two parts only were published. He had, in 1831, printed for private circulation, under the title of 'Bibliotheca Lusitana,' a catalogue of the books in his library relating to Portugal; but this ample and probably unrivalled collection was, with few exceptions, together with nearly the whole remainder of his choice and valuable library, destroyed by fire in 1849. A very remarkable collection, however, of the works of

Camoens, together with other rare and curious selections from his library, have been sold by auction in London within the last two days.

During the earlier part of his life, Mr. Adamson was an enthusiastic collector of coins. He was one of the founders of the local Antiquarian Society, and, as its Treasurer and Secretary, contributed greatly to promote its objects. He also became a Fellow of the Society of Antiquaries, and contributed papers to the 'Archæologia,' as well as to the 'Archæologia Æliana,' of which the most important related to the discovery, at Hexham in 1832, of a number of the Anglo-Saxon coins called Stycas. In Natural History he chiefly attached himself to Conchology, and formed a valuable cabinet of shells amounting to upwards of 3000 species; but despairing of being able to keep pace with the great influx of new species of modern introduction, he determined a few years since to part with this collection. He had previously, in 1823, issued from the Newcastle press for private distribution, a little work entitled 'Conchological Tables,' the principal object of which was to show at a glance, on the authority of the best writers, the number of species in each genus which a collector might hope to procure. He was a Member of the Natural History Society of Newcastle, and, besides other donations to various institutions, he gave a collection of fossils to the Museum at Newcastle, and a collection of minerals to the University of Durham. He became a Fellow of the Linnean Society in 1823, and was elected Corresponding Member of numerous Antiquarian and Literary Societies on the continent of Europe, and Honorary Member of the Antiquarian Societies of Edinburgh, Perth and Cambridge, and of the Literary and Philosophical Society of Halifax. In the month of July last he lost his wife, by whom he had seven children, five of whom survive him. His friends had long noticed his failing health, but he continued attentive to his business until a few days before his death, which took place on the 27th of last September, when he had just completed his 68th year.

John Allcard, Esq., of Burton-Closes, near Bakewell, in the county of Derby, a member of the well-known firm of Overend, Gurney and Co., became a Fellow of the Linnean Society in 1844, and died at his house in Connaught Place West, Hyde Park, London, on the 9th of April of the present year, in the 78th year of his age. He was a very zealous and successful cultivator of ferns, and especially of tree-ferns, of which his collection at Stratford, near London, might some years ago be considered as unrivalled.

The Right Hon. William Bagot, Baron Bagot, D.C.L. &c., was the third but eldest surviving son of William, first Lord Bagot, and was born in Bruton Street, London, on the 11th September 1773. He was educated at Westminster School, and afterwards at Magdalen College, Oxford, from which University he received the degree of D.C.L. in 1834. In 1798 he succeeded his father in the peerage, and in the same year he was elected a Fellow of the Linnean Society. He took no active part in politics, but attached himself to literary and scientific pursuits, especially to agriculture and natural history, and became a Fellow of the Society of Antiquaries, and also of the Horticultural and Zoological Societies. In the year 1824 his Lordship printed 'Memorials of the Bagot Family, compiled in 1823.' He was twice married, and died at his seat, Blithfield, near Stafford, on the 12th of February in the present year, leaving a numerous family by his second wife. His connexion with the Linnean Society extended over the long period of fifty-eight years.

Lewis Weston Dillwyn, Esq., was descended from an old Breconshire family, and was born at Ipswich in the year 1778. His father, William Dillwyn, was a member of the Society of Friends, whose immediate ancestors had emigrated to America in the company of William Penn, and who was himself early and intimately associated with Clarkson and Wilberforce in the agitation for the Abolition of Negro Slavery.

Mr. Dillwyn received his early education at a Friends' school at Tottenham, where he had for the associate of his boyish days our old and valued Fellow, Mr. Joseph Woods, together with whom he was sent for a time to Folkestone on account of the then weak state of his health. In the year 1798 he went to Dover, where he succeeded his school-companion Mr. Woods as the inmate of a friend of the name of Beck. "During his residence at Dover," says Mr. Woods, in a communication on the subject, "I paid him a visit, and well recollect the pleasure we had in rambling over the country, and finding many plants which were then unknown to us. I apprehend that it was during this residence at Dover that he first applied himself to botany, but what fixed his attention to that science I do not know. Probably his intimacy with the three brothers Forster had something to do with it." The fruit of his researches at Dover appeared in a list of plants, read at the Linnean Society in March 1801, and in October of the same year he contributed a notice of the discovery of the *Sisymbrium murale*, L., in the neighbourhood of Ramsgate,

which was published in the sixth volume of our 'Transactions.' At the beginning of 1801 he resided with his father at Walthamstow, but in the following year his father purchased the Cambrian Pottery at Swansea, at the head of which extensive establishment he was thenceforward placed, although he did not absolutely settle there until the year 1803. His principal botanical work, 'The Natural History of British Confervæ,' was commenced in 1802, when he was only 24 years of age; and 'The Botanist's Guide through England and Wales,' in two vols. 8vo, the joint production of himself and Mr. Dawson Turner, was published in 1805. In the establishment which he conducted he found means of turning to good account his studies as a naturalist, and the porcelain of the Cambrian Pottery speedily acquired great celebrity for the faithful and exquisite paintings of birds, butterflies, shells and flowers with which it was ornamented, and which, together with the beauty of the material itself, render the "Swansea China" an article of great value in the eyes of connoisseurs. It was brought to its highest state of perfection about the year 1814, but was soon after laid aside, and earthenware again became, as it now is, the sole product of the Cambrian Pottery.

In 1809 Mr. Dillwyn completed his work on 'British Confervæ,' which formed, at the period of its publication, a most valuable contribution to a very neglected branch of the natural history of the British Islands. Shortly afterwards he married the daughter of John Llewelyn, Esq., of Penllergare, in the county of Glamorgan, on whose death, his eldest son, John Dillwyn Llewelyn, became heir to the extensive estates of his maternal grandfather, and for some years afterwards, as his son's guardian, Mr. Dillwyn resided at Penllergare. Previous, however, to this removal, he published, in 1817, 'A descriptive Catalogue of Recent Shells, arranged according to the Linnean Method,' in two vols. 8vo, a work of great labour and research, which he dedicated to Sir Joseph Banks, with whom he had long been on terms of friendly intimacy, and to the free use of whose extensive library he declares himself in the preface indebted for the means of producing it in so complete a form. This work was followed, in 1823, by 'An Index to the Historia Conchyliorum of Lister, with occasional Remarks,' printed in folio, at the Clarendon Press, at the expense of the University of Oxford, which, on this occasion, offered to Mr. Dillwyn the honorary degree of D.C.L., an honour which he, however, declined. In 1823 also he com-

municated to the Royal Society a paper "On Fossil Shells," which was printed in the 'Philosophical Transactions,' and was succeeded by a second paper on the same subject in the following year. In 1827 he communicated to the Linnean Society a notice of the occurrence of *Ianthina fragilis*, Lam., in the neighbourhood of Swansea, which is published in the 16th volume of our 'Transactions.' Two short papers, one in the third volume of the 'Zoological Journal,' on the Cyprææ described by Mr. Gray, and the other in the 'Proceedings' of the Zoological Society, "On the Capture of a specimen of *Labrus maculatus* in Swansea Bay," were published in 1828 and 1829. His 'Rarer Plants of Swansea,' and his 'Memoranda relating to Coleopterous Insects found in the neighbourhood of Swansea,' both privately printed, were also widely distributed by him in the same years.

In 1832, on the election which followed the passing of the Reform Bill, Mr. Dillwyn was returned to the House of Commons for the county of Glamorgan, of which he had for many years been an active Magistrate, occasionally presiding as Chairman of the Quarter Sessions, and for which he had also served the office of High Sheriff in 1818. The freedom of the borough of Swansea was unanimously presented to him in 1834, "as a mark of great personal respect," and from 1835 to 1840 he served as Mayor and Alderman of the borough. In his capacity of a Member of Parliament, from which he retired at the election of 1841, his votes were given with more than usual independence of party trammels. His portrait appears, in company with those of his friends, Mr. Talbot and Mr. Vivian, in Sir George Hayter's celebrated picture, and has since been separately lithographed by Eddis.

During the period of his parliamentary career his visits to London were necessarily more frequent and of longer duration; but his time was not wholly swallowed up by his attention to public affairs. He was busily engaged in the libraries of the Athenæum, of the British Museum, and of the Royal and Linnean Societies, in preparing 'A Review of the references to the Hortus Malabaricus of Henry Van Rheede Draakenstein,' which he printed in 1839. In the country too he occupied himself on a volume entitled 'Contributions towards a History of Swansea,' 300 copies of which work, printed in 1840, he presented to the managers of a bazaar for the benefit of the Swansea Infirmary, for which valuable institution the sale of these copies is believed to have produced the sum of £150. In 1843 he printed 'Hortus Collinsonianus: an Account of the Plants cultivated by Peter Col-

linson, arranged alphabetically according to their modern names, from the Catalogue of his Garden and other Manuscripts,' which forms a useful commentary on the state of English gardens in the middle of the last century. It was of course with no small delight that Mr. Dillwyn welcomed the meeting of the British Association at Swansea in 1848. As one of the Vice-Presidents of the Meeting, and President of the Section of Zoology and Natural History, he took a warm interest and an active part in all the discussions that arose; and at his residence of Sketty Hall, to which he had some years previously removed, he received with hospitable welcome several of the most distinguished members of the Association. To celebrate the occasion, he dedicated to Lord Northampton and the Council a work 'On the Flora and Fauna of Swansea,' which issued from the local press on the first day of the Meeting, and was received by the members as a pleasing contribution to their local information.

This was the last of his publications: his health gradually gave way, and for several years before his death he had ceased to mingle in the busy world, or to take any active interest in its affairs. He died on the 31st of August last, at Sketty Hall, at the age of 77, leaving two sons (both Fellows of our Society, and both distinguished cultivators of natural history) and two daughters. Mr. Dillwyn was thoroughly honourable and upright in all his dealings, a steady man of business, a liberal and active country gentleman, a warm friend, and a zealous and enlightened contributor to natural science. With his contemporary naturalists, and especially with Sir James Smith, Mr. Dawson Turner, Mr. Edward Forster, Mr. Borrer, Mr. Woods and Mr. Brown, he was on terms of affectionate intimacy; and those of a later generation looked up to him with feelings of grateful respect. He became a Fellow of the Linnean Society in 1800, and of the Royal Society in 1804; and this Society may fairly regard it as a subject of cordial congratulation to have retained for five-and-fifty years the fellowship of so valuable a member and so estimable a man.

George Don, Esq., was born at Forfar, on the 17th of May 1798. He was the eldest son of the zealous British botanist of the same name, well known as the discoverer of many of the most interesting plants of the Scottish Highlands, and a constant correspondent of the late Sir James Edward Smith, who in his 'English Flora' (under *Rosa Doniana*) speaks of him as "one of the most indefatigable, as well as accurate of botanists; who loved the science for its own sake, and braved every difficulty in its ser-

vice." On the death of his father, in 1814, Mr. Don, in conjunction with his younger brother, David, made an attempt to carry on the nursery which their father had established at Forfar; but the business was shortly after given up, the elder brother removing in 1815 to Edinburgh, where he was for a time employed in the establishment of Messrs. Dickson and Co. In the following year he came to London, and after a short engagement at the Portman Nursery, succeeded in obtaining employment at the Chelsea Botanic Garden, then under the charge of Mr. Anderson, with whom he remained as foreman till 1821, when he entered the service of the Horticultural Society, and was shortly after despatched as their collector to Tropical Africa, South America, &c. During this voyage, which occupied something more than a year (from December 1821 till February 1823), he visited Madeira, Sierra Leone, St. Thomas's, Bahia, St. Salvador, Maranham, Trinidad, Jamaica, Havana, &c., and his activity in collecting and sending home living plants, seeds, and dried specimens, obtained for him the highest encomiums of the then Secretary of the Horticultural Society, Mr. Sabine. Many of these plants afterwards flowered at Chiswick, and were described by Professor Lindley in the Horticultural Transactions, &c. Mr. Don's attention having been particularly directed to the introduction of tropical fruits and the procuring of accurate information respecting them, and his visit to Sierra Leone occurring at a time when many of its fruits (then chiefly known from Dr. Afzelius's Report to the African Society) were in perfection, he was enabled to collect materials for a very interesting account of them, which appeared in the 5th volume of the Horticultural Society's 'Transactions,' under the title "Some Accounts of the Edible Fruits of Sierra Leone, drawn up by Joseph Sabine, Esq., Secretary, from the Journal and personal communication of Mr. George Don, A.L.S." At the recent sale of the Herbarium of the Horticultural Society, specimens of the plants obtained by Mr. Don during this expedition, and which are valuable, not merely in connexion with his own botanical labours, but likewise as being, in part, typical of the species described by Messrs. Bentham, Hooker, &c., in the 'Flora Nigritiana,' were purchased for the Herbarium of the British Museum. His brother David having succeeded Mr. Brown, on his resignation in 1822, as Librarian to the Linnean Society, George was for some years domiciled with him. During the earlier part of that period, he appears to have been occupied upon a revision of the genus *Combretum*, which was read before the Linnean Society in

March 1826, and published in the 15th volume of its 'Transactions.' About the same time Mr. Don also communicated to the Wernerian Society a Monograph of the genus *Allium*, which is published in the 6th volume of the Memoirs of that Society. From 1828 to 1837 his time was principally occupied upon the 'General System of Gardening and Botany,' or as it was afterwards called, the 'History of Dichlamydeous Plants,' consisting of four 4to volumes, averaging about 880 pages each. The original intention was, that the work should include all the known species of plants, and that the whole should be comprised in four volumes; but this being found impracticable, and the publishers receiving little encouragement to proceed, it was abruptly closed at the 4th volume without its having extended beyond the *Dichlamydeæ*. He shortly afterwards entered into an engagement to supply the botanical articles of the 'Encyclopædia Metropolitana,' which he continued to do till the close of the work, great part of the introductory treatise having been furnished by him, as well as the articles in the alphabetical series, from the middle of the 11th volume to the end of the 12th. In 1842–3 he was employed by the Board of Woods and Forests in naming the trees and shrubs in Kensington Gardens and the Parks, by means of which the names of a very considerable number of species and varieties of woody plants have become familiar to the visitors. He likewise rendered much assistance to the late Mr. Loudon in the preparation of the various botanical works in which that gentleman was engaged during the last ten or twelve years of his life; and the last of his botanical labours was the preparation of a supplement to Loudon's 'Encyclopædia of Plants,' which made its appearance only a few months before his death. He had been suffering at intervals during the last two years from disease of the heart, which had latterly prevented him from being present at any of our meetings, at which he had for many years previously been a constant attendant, having been elected an Associate in 1822, and a Fellow in 1831. He died at Campden Hill, Kensington, on the 25th of February last, in the 58th year of his age.

Alexander Erskine, Esq., of Balhall, in the county of Forfar, and Longhaven, Aberdeenshire, became a Fellow of the Linnean Society in 1804, and was also a Fellow of the Horticultural Society. He died, at his residence in Bryanstone Square, on the 17th of November last, in the 81st year of his age, having been for more than fifty years a Fellow of our Society.

John Harris, Esq., of Exeter, Surgeon, was admitted a Fellow

of the Linnean Society in 1813, and died at Exeter on the 30th of June last year, at the age of 73.

Samuel Holker Haslam, Esq., became a Fellow of the Linnean Society in 1836. He was warmly attached to literary and scientific pursuits, spoke fluently both French and German, was conversant with Italian, and made considerable collections of plants and insects, both of which he presented, about two years ago, to the Natural History Society of Kendal. He died at his residence, Woodhouse, Milnthorpe, Westmoreland, on the 13th of April in the present year.

Henry Jenner, Esq., M.D., was the son of the Rev. Henry Jenner, M.A., Rector of Rockhampton in Gloucestershire, and Domestic Chaplain to the Earl of Aylesbury. In 1783 he was apprenticed to his uncle, the celebrated Dr. Edward Jenner, and being of an inquiring disposition and greatly attached to natural history, assisted him, not only in his professional avocations, but also in his natural-history studies. In this way he took a share in the investigation in relation to the Habits of the Cuckoo, published by his uncle in the 'Philosophical Transactions' for 1788. He became a Fellow of the Linnean Society in 1799, and had consequently been a Member for the long period of 57 years. His death took place in March of the present year at Berkeley, in Gloucestershire, where he had continued to reside.

Joseph Neeld, Esq., F.S.A., of Grittleton, in the county of Wilts, a Deputy-Lieutenant of Wiltshire, M.P. for the borough of Chippenham, and High-Steward of Malmesbury, was a grand-nephew of the late Philip Rundell, of Ludgate Hill, at whose death in 1827 he became possessed, as residuary legatee, of property little short of a million sterling. In the subsequent year he purchased the estate of Grittleton, to which he has since made large additions, of which Mr. Britton has lately given a particular account. A new mansion, on a scale and of a character fitted to rank with the most magnificent seats in the country, is in progress of erection; the farm-houses, cottages, and churches have been rebuilt, and the whole domain has been placed under a general system of amelioration and improved cultivation. In Parliament, Mr. Neeld was a steady supporter of the Conservative party: he married, in 1831, a sister of the present Earl of Shaftesbury, but having no issue, his great estates devolve upon his brother John. He became a Fellow of the Linnean Society in 1829, and died on the 24th of March in the present year, at the age of 67.

Rear-Admiral the Hon. William Henry Percy, sixth son of Alger-

non, first Earl of Beverley, was born on the 24th of March 1788. He entered the Navy in 1801 as first-class volunteer on board the Lion, 64, and became in the next year Midshipman of the Medusa, 32. In that ship, after sharing in the capture of several Spanish frigates and merchantmen of great value, he sailed with the Marquis Cornwallis for the East Indies, and returned from the Ganges to the Lizard, a distance of 13,831 miles, in the surprisingly short period of 84 days. He next served on board of several vessels on the Home Station, and became in 1807 Lieutenant of the Decade frigate, and afterwards of the Hibernia. In 1810 he obtained the rank of Commander, and was appointed to the Mermaid, 28, which was engaged in the conveyance of troops to Portugal and Spain. He was posted in 1812, and in 1814 commanded the Hermes, 20, which vessel, after twenty-five of her crew had been killed, and twenty-four wounded, in an unsuccessful attack on Fort Bowyer, Mobile, was set on fire and destroyed to prevent her falling into the hands of the Americans. On the court-martial which ensued, Captain Percy, who had also on this occasion under his command the Canon, 20, and Sophia and Childers, of 18 guns each, was honourably acquitted of all blame.

He sat in two Parliaments, from 1818 to 1826, for the borough of Stamford, and was appointed a Commissioner of Excise in 1828, from which office he retired in 1849, having previously, in 1846, accepted the rank of Rear-Admiral. His fellowship of the Linnean Society dates from 1823, and he died, unmarried, at the house of his brother, the present Earl of Beverley, in Portman Square, on the 5th of last October, in the 68th year of his age.

Henry Perkins, Esq., of Hanworth Park, in the county of Middlesex, one of the celebrated firm of Barclay, Perkins and Co., became a Fellow of the Linnean Society in the year 1825, and was also a Fellow of the Geological and Horticultural Societies. He died at Dover, on the 15th of April of the present year, at the age of 78.

John Reeves, Esq., F.R.S. &c., was the youngest son of the Rev. Jonathan Reeves of Westham, near London, and was born on the 1st of May 1774. Left an orphan at an early age, he was educated at Christ's Hospital, and afterwards entered the counting-house of a tea-broker, where he acquired so thorough a knowledge of teas, as to recommend him in 1808 to the office of Inspector of Tea in England in the service of the Honourable East India Company. In 1812 he proceeded to China as Assistant, and subsequently became Chief Inspector of Tea in the East

India Company's establishment at Canton. From the time of his arrival in China, he devoted his leisure to investigating the resources of the country, and to the pursuit of various branches of science, making it his principal object to procure specimens of the natural productions of the country, and especially those which promised to be either useful or ornamental, and to transmit them to England to such individuals or societies as appeared most likely to turn them to account. His principal correspondent for some years after his first arrival in China was Sir Joseph Banks. He formed no collections of his own, neither did he keep any record of his proceedings in this respect; so that were it not for the knowledge possessed by many among us of the extent of his contributions to our gardens and museums, there would be some risk of our obligations to his memory remaining unacknowledged and forgotten. During the whole period of his residence in China, from 1812 to 1831, he contributed largely to English horticulture, and to the Horticultural Society in particular, not only by his own direct shipments of plants, but also by collecting plants during the spring and summer, establishing them well in pots previous to the shipping season, and then commending them to the care of the captains of the Company's ships, to whom he was also always ready to recommend the most desirable plants for transportation to England. It was in this way, to instance one case among many, that the *Wistaria Sinensis* first found its way to England. It was in the latter part of his stay in China that he made the fine collection of fishes, which, together with his drawings, furnished the groundwork of Sir John Richardson's valuable Report "On the Ichthyology of the Seas of China and Japan," published in the 'Reports of the British Association' for 1845. As the history of these drawings and collections strikingly illustrates his activity in collecting, and disinterestedness in distributing his materials, I cannot do better than quote the observations of Sir John Richardson in regard to them. "For upwards of fifteen years," says that gentleman, "materials for an ample account of the fishes of China have existed in England. John Reeves, Esq., who was long resident at Macao, with an enlightened munificence, caused beautiful coloured drawings, mostly of the natural size, to be made of no fewer than 340 species of fish, which are brought to the markets of Canton. These drawings are executed with a correctness and finish which will be sought for in vain in the older works on ichthyology, and which are not surpassed in the plates of any large European work of the present day. The brilliancy

and effect of the colouring, and correctness of profile, render them excellent portraits of the fish they are intended to represent. Mr. Reeves had four copies of these drawings made. One set, which he presented to General Hardwicke, is bound up with that officer's large collection of sketches of Indian Fish, in four folio volumes, in the British Museum. Another copy, left by Mr. Reeves at Macao with Mr. Beale, formed the groundwork of the enumeration of Chinese fishes in Bridgeman's 'Chrestomathy.' A third copy, which he liberally lent to me, is the foundation of this Report. Mr. Reeves has also deposited in the British Museum specimens of Chinese fish, both dried and preserved in spirits, part of them the very examples which are figured in his drawings. His son, John Russell Reeves, Esq., [also, let me add, a valuable Fellow of our Society,] has likewise presented various fish procured at Macao to the British Museum; among which are several species not figured in his father's drawings." Mr. Reeves's contributions to the British Museum were not limited to the Natural-History departments, but included also the Library and the department of Antiquities, to the latter of which in particular he gave, from his large collection of Chinese coins, all such as were thought desirable for the national cabinet. At an early period of his residence in China, he collected, at the request of Dr. Morison, the Chinese names of the stars and constellations, which were published at that time, and are usually bound up with Dr. Morison's Chinese Dictionary.

Mr. Reeves became a Fellow of the Linnean Society in 1817, and of the Royal Society in the same year; he was also a Fellow of the Horticultural Society, the Royal Astronomical, the Asiatic, and the Zoological Societies, and of the Society of Arts; and most of these institutions are indebted to him for valuable contributions to their collections. From the time of his return to England, in 1831, he resided at Clapham, where he died on the 22nd of March in the present year, having nearly completed his 82nd year.

Samuel Rootsey, Esq., for many years Lecturer on Chemistry and Botany in the Medical School of Bristol, was born on the 12th of February 1788, at Colchester, where his father was the proprietor of extensive oil-mills. At an early age he was placed under the charge of his grandmother at Halstead in the county of Essex, and attended the grammar-school of that place for some years; after which he was removed to a boarding-school at Harlow in the same county. In 1803 he was apprenticed to a chemist at Southampton, and eagerly attached himself to the study of che-

mistry and botany, and to the acquisition of different languages, which occupied a large share of his attention during the remainder of his life. Soon after the expiration of his apprenticeship he wrote to Dr. Maton, to whom he was then personally unknown, stating his anxious desire to become a Fellow of the Linnean Society, and so strongly was Dr. Maton impressed in his favour by the terms of his letter, that he readily undertook to propose him. In the following year he was elected, and passing some time in London, was introduced by Dr. Maton to Sir Joseph Banks, Sir James E. Smith, and other eminent men of science, and derived great advantage from the permission readily granted him by Sir J. Banks to make use of his library and herbarium. In the year 1812, Mr. Rootsey established himself at Bristol as a chemist and druggist, and soon after commenced his Lectures on Chemistry and Botany, the latter of which he continued until within a short period of his death. In 1815 he published "A General Dispensatory, or Arrangement of the Pharmacopœias of London, Edinburgh and Dublin," which he dedicated to Dr. Maton; and in 1818, a "Syllabus of a Course of Botanical Lectures," delivered to his pupils at Bristol. He also published a new system of Notation in Music, and various other works. A tour in Sweden in 1824 made him acquainted with Westring, from whom he obtained the copper-plates of his Essays on Lichens and the Dyes afforded by them, of which he proposed publishing an English translation; but unfortunately this intention was never carried out. He also made the acquaintance of Broling and Afzelius; and his MS. Journal of his tour is stated to contain some highly interesting facts and observations relating to natural history. In it he mentions, among other subjects on which he was engaged, a new projection of the World, his theory of vocal intervals in Music, his mode of studying the Chinese Characters, his system of Pharmacy, his Mineralogical Sliding-Rule, &c. &c. In 1826 he published a revised and corrected edition of Donne's 'Mechanical Geometry;' and besides the separate publications already mentioned, he communicated to the Philosophical and Literary Institution of Bristol, of which he was an Honorary Member, numerous Papers on a variety of subjects, and to the Medico-Botanical Society a Paper "On the Medical Botany of Shakespeare," which was published in their 'Transactions' for 1832. From the year 1834 he was chiefly occupied in lecturing on various subjects, but more particularly on Botany, in Bristol, Bath, Swansea, Neath, and other towns in the Western district; but of late years his health

had been gradually failing, and he died on the 4th of September last, after a short illness, in the 68th year of his age.

Thomas Salter, Esq., was the descendant of a highly respectable Quaker-family in Somersetshire, and became at an early age the pupil of the late Thomas Bell, Esq. of Poole, the father of our excellent President. In 1809 he entered at St. Thomas's Hospital, and in 1810 he was admitted a Member of the Royal College of Surgeons, the Council of which, on the grant of their new Charter in 1844, conferred on him the title of Fellow. On his return to Poole, after the completion of his medical studies in London, he was admitted into partnership by Mr. Bell, whose only daughter he married. From that time, until the day of his death, he continued to practise his profession in Poole, where he acquired a high degree of influence, not only by the success of his medical practice, but also by his social qualities, the cheerfulness of his disposition, and the atmosphere of pleasant comfort which his presence diffused even in the chamber of sickness and of suffering. Through the whole of this lengthened period he prosecuted his profession in all its scientific bearings, and constantly kept pace with advancing discovery, reading all the most important medical works as they appeared, and preparing with his own hands anatomical and pathological specimens. The medical library which he has left behind him is one of the largest, and his medical museum by far the most important in the county of Dorset. He also contributed many valuable Papers to medical literature, most of which were published in the Transactions of the different medical societies; and educated more than twenty pupils, many of whom, including his three surviving sons, hold a distinguished position in the ranks of the profession: two of his sons are Fellows of our Society. His youngest son, Mr. Morgan Salter, unhappily volunteered to take the medical charge of H.M.S. Prince, and perished from the wreck of that ill-fated ship in the great storm at Balaklava. Mr. Salter's death, which was no doubt hastened by this sad event, from the shock of which he never recovered, took place suddenly. On his way to visit some sick poor, on the night of the 20th of February, the extreme coldness of the air appears partially to have arrested his circulation, which his heart was apparently too feeble to restore. He sought refuge in the house of a friend, where he died before any assistance could arrive, from no actual disease, but from sudden and complete prostration of the system. In early life he devoted his few leisure hours to the study of geology, botany and chemistry, and he has

left a choice and numerous collection of fossils accumulated at that period. In 1824 he became a Fellow of the Linnean Society, and in 1827 of the Medico-Chirurgical: he held also the Commission of a Justice of Peace for the town of Poole. Although it was his express desire that his funeral should be quiet and unostentatious, some hundreds of the most respectable inhabitants of the town attended to do honour to his memory, and the closing of shops and private houses in the route through which the funeral was to pass, evinced the deep respect in which he was held. He died at the age of 70.

The Most Noble Edward Adolphus, Duke of Somerset, K.G., Vice-Admiral of the Coast of Somersetshire, D.C.L., F.R.S., F.S.A., and a Trustee of the Hunterian Museum, was born at Monkton-Farley in Wiltshire, on the 24th of February 1775. While in his nineteenth year he succeeded to the title and estates. He was a Member of Christ Church College, Oxford, where the degree of M.A. was conferred upon him in 1794, and that of D.C.L. in 1810. From an early age he evinced an attachment to science: he was elected F.R.S. in 1797; in 1816 he became F.S.A., and in 1820 F.L.S. For some years he was President of the Royal Institution; and from 1801 to 1838 he was likewise President of the Literary Fund, to which he contributed largely during forty-six years. From 1826 to 1831 he was a Vice-President of the Zoological Society. At the anniversary of 1834, on the resignation of Lord Stanley, he was elected President of the Linnean Society, and continued to hold that office till the end of 1837, when he resigned and was succeeded in it by the late Lord Bishop of Norwich. His uniform courtesy of manners and amiability of temper, combined with the hospitable and friendly reception which he gave to men of literature and science, and the extent of his information on a wide range of subjects, will cause his memory to be cherished and respected by all who were admitted to the privilege of meeting him in social intercourse. In science he chiefly attached himself to mathematical studies, and published, in 1842, "A Treatise in which the Elementary Properties of the Ellipse are deduced from the Properties of the Circle, and geometrically demonstrated," of which a second edition was printed in the following year; and the investigation was still further pursued in another treatise, entitled "Alternate Circles and their Connexion with the Ellipse," published in 1850. His Grace was twice married, first to a daughter of the Duke of Hamilton, and secondly to the eldest daughter of Sir Michael Shaw Stewart, Bart., who,

together with seven of his children by his first wife, survives him. He died on the 15th of August last, at his residence in Park Lane, and was buried in the cemetery at Kensal Green. His eldest son, the present Duke, has filled several important offices in the State, and is a Trustee of the British Museum.

William Swainson, Esq., F.R.S., Hon. M.C.P.S. &c., was born on the 8th of October 1789. His father was then Secretary of the Board of Customs in London, and subsequently filled the important office of Collector of the Port of Liverpool. At the early age of 14, he was appointed a Junior Clerk in the same branch of the service; but a love of natural history had been so strongly implanted in him, when a mere child, by the inspection of his father's collections of British insects and shells, that it became impossible to reconcile his ardent disposition to the formal routine of official life at home. To gratify his inclination for studying the natural history of other countries, his father therefore obtained for him an appointment in the Commissariat, and in this new capacity, after a short stay at Malta, he arrived in Sicily in the spring of 1807. During the eight succeeding years he was chiefly stationed in that island, and no serious operations being undertaken by the corps to which he was attached, he had abundant opportunities of adding to his collections of plants, insects, shells and fishes, and leisure to make a multitude of drawings and sketches of natural objects. During this period he made an excursion to Greece, and also visited Naples, Genoa and Tuscany. In 1815 he returned to England, bringing with him large collections in natural history; and resolving henceforward to devote himself to no other pursuit, he relinquished the certain prospect of rapid advancement in his profession, and retired upon half-pay. His great object was to visit some distant part of the world which had been little investigated by naturalists, and he first fixed upon Southern Africa; but on hearing of the successful journey of Dr. Burchell in that region, which he supposed to have nearly exhausted its natural productions, he determined on penetrating into the interior of Northern Brazil. With this view, in company with Mr. Koster, the narrative of whose first journey in Brazil had just been published, he left England late in the autumn of 1816. But his attempts to traverse the Continent, or even to penetrate far into the interior, were frustrated by the revolution of 1817, and he was compelled to content himself with collecting in the neighbourhood of Olinda, in the district of the Rio San Francisco, and afterwards in that of Rio de Janeiro. On his

return to Liverpool he proposed to publish a Narrative of his Travels, but a short abstract of them given in the 'Edinburgh Philosophical Journal' having attracted little attention, he abandoned the idea, and determined to confine himself to the publication of his zoological materials. Accordingly having familiarized himself with the then novel art of lithography, he commenced a series of plates, drawn by himself, and issued periodically, under the title of 'Zoological Illustrations,' the first series of which, consisting of three vols., were published between the years 1820 and 1823. In order more efficiently to superintend this publication, and also another in which he soon afterwards engaged, under the title of 'Exotic Conchology,' he removed to London; but, in 1825, in pursuance of an engagement long previously formed, he married the daughter of John Parkes, Esq. of Warwick, and took up his residence in that town. In 1826 he lost his father, and soon after entered into engagements with Messrs. Longman for the publication of an 'Encyclopædia of Zoology,' which was intended to form a companion volume to Loudon's 'Encyclopædia of Agriculture and Gardening.' On reconsidering the subject, however, the publishers determined to combine this intended work with their projected 'Cabinet Cyclopædia,' and eleven volumes of the 'Cabinet Cyclopædia of Natural History,' from the pen of Mr. Swainson, successively made their appearance between 1834 and 1840, embracing 'A Preliminary Discourse on the Study of Natural History,' 'A Treatise on the Geography and Classification of Animals,' 'A Treatise on the Natural History and Classification of Quadrupeds;' of 'Birds,' 2 vols.; of 'Fishes, Amphibia, and Reptiles,' 2 vols.; of 'Shells and Shell-fish,' 2 vols.; and volumes on 'The Habits and Instincts of Animals,' on 'Animals in Menageries,' on 'Taxidermy, Bibliography, and Biography,' and, in conjunction with Mr. Shuckard, 'On the History and Natural Arrangement of Insects.' Previous to commencing this laborious undertaking, Mr. Swainson had again changed his residence from Warwick to Tittenhanger Green, in the neighbourhood of St. Albans, where he found himself sufficiently removed from the distractions of a residence in London, and at the same time sufficiently near the metropolis, to avail himself frequently of its libraries and collections. Here also he prepared and published a second series of his 'Zoological Illustrations,' consisting, like the first, of three vols. 8vo; two volumes on 'The Birds of Western Africa,' and one on 'The Flycatchers,' forming part of Lizars's 'Naturalist's Cabinet'; extensive contributions to the volume of

Sir John Richardson's 'Fauna Boreali-Americana,' illustrating the Birds; the zoological portion of Murray's 'Encyclopædia of Geography;' 'Elements of Conchology, for the use of Students and Travellers;' and five parts of a work entitled 'Ornithological Drawings: Series 1, Birds of Brazil.' In 1828 Mr. Swainson passed several weeks in Paris, busied in studying the collections of the French Museum, and adding to his large collection of natural-history drawings. In 1835 he was left a widower with five children; and marrying again some years afterwards, he determined on emigrating, with his family, to New Zealand, on the climate of which, principally with reference to its sanative character, he published a little work in 1840. In that year he embarked on board a vessel, from the unseaworthiness of which he unfortunately lost a large portion of his collections; while, on his arrival in New Zealand, he soon found that he had been misled by exaggerated representations. He did not, however, suffer himself to be dejected by these losses and disappointments. From Rio de Janeiro, at which the vessel had touched to refit, he had brought with him numerous vegetable productions, which he thought would be suitable to the climate of New Zealand, and he set himself energetically to work to establish himself in his new abode. Of his pursuits as regards natural history during this period few traces have reached England, although it cannot be doubted that here, as elsewhere, a large portion of his attention must have been devoted to his favourite pursuit. We only know that he had his full share of those losses and privations which usually fall to the lot of the earlier settlers in a new colony, aggravated by the storms and earthquakes to which New Zealand appears to be peculiarly subject. In 1851 he visited Sydney; and in 1853, he was engaged, under the authority of the governments of Van Diemen's Land and Victoria, in an examination of the timber-trees of those colonies. Soon afterwards he returned to his residence at Fern Grove, River Hutt, New Zealand, where he died, it is supposed of an apoplectic seizure, after a week or ten days' illness, on the 7th of December last, in the 67th year of his age. His entry into the Linnean Society dates from 1816, and into the Royal Society from 1820; and he was also an Honorary or Corresponding Member of numerous scientific societies both in Europe and America. Of his five children by his first wife, four sons survive him; and of these, two are settled in New Zealand. By his second wife he had three children, all daughters, who, with their mother, also survive him. In addition to the extensive series

of separate works above mentioned, he was author of 'Instructions for Collecting and Preserving Subjects of Natural History and Botany,' Liverpool, 1808 and 1820, subsequently enlarged into 'The Naturalist's Guide for Collecting,' &c., London, 1822 and 1824; and of numerous Papers in Scientific Transactions and Journals, among the most important of which are the following:—

1. On the genus *Picus* of Linnæus, &c.—*Mem. Wern. Soc.* iii. p. 288.

2. On two new Birds of the genus *Pteroglossus* of Illiger.—*Journ. Roy. Inst.* ix. p. 266.

3. On two new and remarkable Freshwater Shells, *Melania setosa* and *Unio gigas*.—*Ibid.* xvii. p. 13.

4. On several new Shells belonging to the Linnean genus *Voluta*.—*Ibid.* xvii. p. 28

5. Monograph of the genus *Ancillaria*.—*Ibid.* xviii. p. 272.

6. On *Psittacus Fieldii*, a new species of Parrot from Australia.—*Ibid.* xix. p. 198.

7. Monograph of the genus *Tachyphonus*.—*Ibid.* xx. p. 60.

8. On the Tyrant Shrikes of America.—*Ibid.* xx. p. 267.

9. On the Importance of preserving Facts connected with the Natural History of Animals.—*Ibid.* xxiii. p. 83.

10. The Characters of *Achatinella*, a new group of Terrestrial Shells.—*Ibid.* xxv. p. 81.

11. On those Birds which exhibit the typical perfection of *Anatidæ*.—*Ibid.* ser. 2. ii. p. 11.

12. An Inquiry into the Natural Affinities of the *Laniadæ*.—*Zool. Journ.* i. p. 289.

13. On the Characters and Natural Affinities of several new Birds from Australia.—*Ibid.* i. p. 443.

14. Characters and Descriptions of several Birds belonging to the genus *Thamnophilus*, Vig.—*Ibid.* ii. p. 84.

15. On two new genera of Birds, *Formicivora* and *Drymophila*, with Descriptions of several Species.—*Ibid.* ii. p. 145.

16. On the genus *Psaris* of Cuvier.—*Ibid.* ii. p. 354.

17. On several Groups and Forms in Ornithology not hitherto defined.—*Ibid.* iii. p. 158, & p. 343.

18. On the Analogies of the *Mitranæ*.—*Proc. Zool. Soc.* iii. p. 197.

19. On *Hemipodius nivosus*, a new Bird from Africa.—*Phil. Mag.* lx. p. 353.

20. On *Iridina*, a genus of Freshwater Bivalve Shells.—*Ibid.* lxi. p. 112.

21. The Characters of several rare and undescribed Shells.—*Phil. Mag.* lxi. p. 375, & lxii. p. 401.

22. On the Natural Affinities of the *Lepidoptera Diurna* of Latreille.—*Ibid.* ser. 2. i. p. 180.

23. Synopsis of the Birds discovered in Mexico by W. Bullock, F.L.S., and W. Bullock, Jun.—*Ibid.* ser. 2. i. p. 364, & p. 433.

24. On the Nut-hatch (*Sitta Europæa*).—*Mag. Nat. Hist.* i. p. 328.

25. On the Natural History and Relations of the Family of *Cuculidæ*.—*Mag. Zool. & Bot.* i. p. 213, & p. 430.

The titles of this long list of publications sufficiently indicate the wide scope of his zoological acquirements. He became deeply imbued, at an early period, with Mr. W. S. MacLeay's views on the circular succession of affinities, and the strict numerical relations of the several groups; and carried out these principles, with some peculiar modifications of his own, through nearly all the classes of the animal kingdom. As a zoological draughtsman he also attained high distinction, combining the skill of a practised artist with the accuracy of a well-instructed naturalist, and thus giving to his representations of animals a double interest as accurate copies of nature embellished by a refined taste in art.

The Rev. William Webb, D.D., Master of Clare Hall in the University of Cambridge, was the son of William Webb, M.A., Master of Bishop Vesey's Grammar-school at Sutton-Coldfield, near Birmingham, and a magistrate of the county of Warwick. He was born at Sutton-Coldfield in February 1775, and educated at home until sent to Clare Hall in 1793, where he took his degrees of B.A. 1797, M.A. 1800, B.D. 1808, and D.D. 1816. He became Fellow and Tutor of his College, and in 1815 was unanimously elected Master, which office he filled for the long period of forty-one years, during which he was twice Vice-Chancellor of the University. Previous to his election as Master, he held for a short time the living of Fornham near Bury St. Edmunds, and subsequently that of Litlington near Cambridge. At this place, during his incumbency, in the year 1821, a Roman cemetery was opened, which yielded an extraordinary store of sepulchral vessels. These are now preserved in the library at Clare Hall, and are described in two papers in the 'Archæologia,' vols. 25 and 26, accompanied by plates from drawings made by Mrs. Webb. By this lady, to whom he was married in 1815, during his short connexion with the rectory of Fornham, he had several children, one of whom, a son, alone survives. Dr. Webb

is stated to have rendered great services both to his College and to the University. He collected a very valuable library of topographical, antiquarian and botanical works, as well as a considerable number of articles of *virtù*, which have been sold by auction since his death. He was elected a Fellow of the Linnean Society in 1815, and died at Litlington, on the 4th of January in the present year, in the 81st year of his age.

The only death which it is my duty to record as having occurred among our *Foreign Members* during the past year, is that of *Johann Christoph Friedrich Klug*, Doctor of Medicine and Philosophy, for the last thirty-eight years Extraordinary Professor in the University of Berlin, and one of the Directors of the Royal Zoological Museum of that capital. Information of the death of this distinguished entomologist has been so recently communicated to me, that I have not yet had the opportunity of making myself sufficiently acquainted with the particulars of his life to give even an imperfect sketch of his career. He was born at Berlin on the 5th of May 1775, and educated at the University of Halle, where he printed, in 1797, his inaugural dissertation, entitled 'Historia Instrumentorum ad Polyporum extirpationem.' His entomological publications commenced with a valuable 'Monographia Siricum Germaniæ,' published at Berlin in 4to, 1803; and this has been followed by a long succession of monographs (chiefly on the stinging *Hymenoptera*) and other works, extending nearly to the present time. Of these thirty-five are enumerated in the 'Bibliographia Zoologiæ et Geologiæ' of the Ray Society. As Keeper of one of the most extensive and best-arranged collections of insects in Europe, he had ample opportunities of contributing to entomological science, not only by his own labours, but also by the assistance which he was ever ready to afford in facilitating the labours of others.

The Secretary also announced that nineteen Fellows had been elected since the last Anniversary.

At the Election which subsequently took place, Thomas Bell, Esq. was re-elected President; William Yarrell, 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:—Robert Bentley, Esq.; L. L. Dillwyn, Esq.; Richard Owen, Esq.; Joseph Woods, Esq.; and James Yates, Esq.

The President nominated Francis Boott, Esq., M.D.; Robert Brown, Esq.; Richard Owen, Esq.; and William Yarrell, Esq., Vice-Presidents for the ensuing year.

The President proposed the Election of His Majesty Don Pedro, King of Portugal, as one of the Honorary Members; which, having been put to the Society by open vote, was carried unanimously.

June 3rd, 1856.

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

Mr. William Penny was elected an Associate.

J. O. Westwood, Esq., F.L.S., made some observations on a Lepidopterous Insect infesting the Sugar-canes of the Island of Mauritius, and greatly diminishing the saccharine products (see "Zoological Proceedings," p. 101); and a Conversation followed among the Members present on the best means of destroying the insect and thereby preventing its ravages.

Read, a "Note on the development of *Fungi* upon Patna Opium;" by the Rev. M. J. Berkeley, M.A., F.L.S. &c. (See "Botanical Proceedings," p. 143.)

June 17th, 1856.

Special General Meeting.

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

The Meeting having been specially summoned "to consider a proposal from Her Majesty's Government to give Apartments to the Linnean Society in Burlington House," contained in a Letter addressed by the Secretary of the Treasury to the President of the Royal Society, and printed at p. xxxii, it was moved by Joseph Dalton Hooker, Esq., M.D., seconded by John Forster, Esq., and resolved unanimously:—

That the Council be authorized to place itself in communication with the Councils of the Royal and Chemical Societies, with the view of carrying out the proposal of the Government, as to the occupation of Burlington House.

June 17th, 1856.

Ordinary Meeting.

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

Joseph Wainwright, Esq. was elected a Fellow.

Read, a Paper "On a New Organ in Insects;" by J. B. Hicks, Esq., M.D., F.L.S. (See "Zoological Proceedings," p. 136.)

Read also, a Paper "On a New Species of *Peziza*;" by Frederick Currey, Esq., F.L.S.

Read further, "Notes on some rare or undescribed *Fungi* lately found in the vicinity of Malvern, Worcestershire;" by Edwin Lees, Esq., F.L.S.

ADDITIONS

TO THE

LIBRARY OF THE LINNEAN SOCIETY.

RECEIVED FROM JANUARY 1, 1856, TO JUNE 30, 1856.

[*Continued from page* xv.]

TITLES.	DONORS.

ACADEMIES and SOCIETIES.

Basel :—Naturforschende Gesellschaft. Verhandlungen, heft 2. Basel, 1855, 8vo. THE SOCIETY.

Batavia :—Natuurkundige Vereeniging voor Nederlandsch Indië. Natuurkundig Tijdschrift. Nieuwe Serie, deel 5, afl. 5 & 6, & deel 6, afl. 3–6. Batavia, 1855, 8vo. THE SOCIETY.

Berlin :—Verein zur Beförderung des Gartenbaues in den K. preussischen Staaten. Verhandlungen. band 16–19, bd. 20, heft 1, & band 21. Berlin, 1842–53, 4to.

—— : —— Neue Reihe, jahrg. 3. *Ib.* 1855, 8vo. THE SOCIETY.

Bombay :—Hon. East India Company's Observatory. Magnetical and Meteorological Observations made at, in the years 1852 & 1853. Bombay, 1855, 4to. THE COMPANY.

Breslau :—Imperial Academy "Naturæ Curiosorum." Nova Acta, tom. 24, suppl. & tom. 25, pars 1. Vratislaviæ et Bonnæ, 1854–55, 4to. THE ACADEMY.

Calcutta :—Asiatic Society. Asiatic Researches, vol. 18. Calcutta, 1833, 4to. THE SOCIETY.

Charleston, S. C. :—Elliott Society of Natural History. Proceedings, No. 1. 1853, 8vo. THE SOCIETY.

Cherbourg :—Société Imp. des Sciences Naturelles. Mémoires, tom. 2. Cherbourg, 1854, 8vo. THE SOCIETY.

Dublin :—Geological Society. Journal, vol. 7, parts 1 & 2. Dublin, 1856, 8vo. THE SOCIETY.

Frankfort :—Senckenbergische Naturforschende Gesellschaft. Abhandlungen. band 1, lief. 2. Frankfort-a-M., 1855, 4to. Schädel abnormen Forms, in geometrischen Abbildungen, &c., von Dr. J. C. G. Lucæ. *Ib.* 1855, fol. THE SOCIETY.

TITLES.	DONORS.

ACADEMIES and SOCIETIES (*continued*).

Geneva:—Société de Physique et d'Histoire Naturelle. Mémoires, tom. 14, part. 1. Genève, 1855, 4to. THE SOCIETY.

Göttingen:—Königl. Gesellschaft der Wissenschaften.

Abhandlungen, band 6. Göttingen, 1856, 4to.

Nachrichten, &c., vom Jahre 1855 (Nos. 1–18.). *Ib.* 8vo. THE SOCIETY.

Hobart Town:—Royal Society of Van Diemen's Land.

Papers and Proceedings, vol. 2, part 3. Hobart Town, 1854, 8vo.

Tasmanian Contributions to the Exhibition of Industry at Paris, 1855, fol.

THE SOCIETY, through JOSEPH MILLIGAN, Esq. F.L.S.

Liège:—Société des Sciences. Mémoires, tome 10. Liège, 1855, 8vo. THE SOCIETY.

London:—

British Museum, Catalogues of the Collections in.

List of the Specimens of Birds, part 4. London, 1856, 12mo.

Catalogue of Shield Reptiles, part 1. *Ib.* 1855, 4to.

List of Lepidopterous Insects, parts 6 & 7. *Ib.* 1855–56, 12mo.

Catalogue of Coleopterous Insects, part 8. *Ib.* 1855, 12mo.

Catalogue of the Crustacea, part 1. *Ib.* 1855, 12mo.

List of the Mollusca, part 1. *Ib.* 1855, 12mo.

List of the Specimens of British Animals, part 17. *Ib.* 1855, 12mo. THE TRUSTEES.

Entomological Society. Transactions. New Series, vol. 3, parts 7 & 8. London, 1856, 8vo. THE SOCIETY.

Exhibition of the Works of Industry of All Nations, 1851. First Report of the Commissioners. London, 1852. WILLIAM MATCHWICK, Esq.

—— —— Third ditto. *Ib.* 1856, 8vo. THE COMMISSIONERS.

Geological Society. Quarterly Journal, nos. 45 & 46. London, 1856, 8vo. THE SOCIETY.

Royal Society.

Philosophical Transactions, part 2 for 1855. London, 1855, 4to.

Proceedings, vol. 7, nos. 16–20. *Ib.* 1856, 8vo.

List of the Members, Nov. 30, 1855, 4to. THE SOCIETY.

Royal Agricultural Society. Journal, vol. 16, part 2. London, 1856, 8vo. THE SOCIETY.

TITLES. DONORS.

ACADEMIES and SOCIETIES (*continued*).

Royal Asiatic Society. Journal, vol. 16, part 2. London, 1856, 8vo. THE SOCIETY.

Royal Astronomical Society.

Memoirs, vol. 24. London, 1856, 4to.

Monthly Notices, vol. 15. *Ib.* 1855, 8vo. THE SOCIETY.

Royal Geographical Society.

Journal, vol. 25. London, 1855, 8vo.

Proceedings, nos. 1–3. *Ib.* 1856, 8vo. THE SOCIETY.

Society of Arts. Journal, nos. 163–188. London, 1856, 8vo. THE SOCIETY.

Zoological Society.

Proceedings, nos. 296–298. London, 1855, 8vo.

Illustrations to ditto, for 1850–52, 8vo. THE SOCIETY.

Madrid:—Real Academia de Ciencias.

Memorias. 3ra serie. *Ciencias Naturales*, tomo 1, pte. 3. Madrid, 1853, 4to.

—— —— 1ra serie. *Ciencias Exactas*, tomo 1, pte. 1. *Ib.* 1853, 4to.

Resumen de las Actas, &c. *Ib.* 1851–53, 4to. THE ACADEMY.

Munich:—Königl. Bayerische Akademie der Wissenschaften.

Abhandlungen der mathem.-physikal. Classe, bd. 7, abth. 3. München, 1855, 4to.

Gelehrte Anzeigen, bände 40 & 41. *Ib.* 1855, 4to.

Almanach für das Jahr 1855. *Ib.* 8vo.

Verzeichniss von Verlagsschriften der Akademie, 8vo.

Reden gehalten von Fr. von Thiersch, Nov. 28, 1854; März 28, 1855, & Nov. 28, 1855. München, 1855, 4to.

Denkrede auf Dr. Thad. Siber & Dr. G. S. Ohm, vorgetragen am 28 März, 1855, von Dr. Lamont. *Ib.* 1855, 4to.

Ueber die Gliederung der Bevölkerung des Königreichs Bayern, von Dr. von Hermann. *Ib.* 1855, 4to. THE ACADEMY.

Neustadt a.-d.-H.:—Pollichia (ein naturwissenschaftliche Verein der Bayerischen Pfalz.). Jahresberichte 12 & 13. Neustadt a.-d.-H., 1854–55, 8vo. THE ASSOCIATION.

Newcastle-upon-Tyne:—Tyneside Naturalists' Field Club.

Transactions, vol. 2. part 4, and vol. 3, part 1. Newcastle, 1854–55, 8vo. THE CLUB.

TITLES. DONORS.

ACADEMIES and SOCIETIES (*continued*).

Paris:—

Société Botanique. Bulletin, tome 1, nos. 2–7, tome 2, nos. 1–11, and tome 3, no. 1. Paris, 1854–56, 8vo. THE SOCIETY.

Académie des Sciences de l'Institut de France. Comptes rendus, tomes 40 & 41. Paris, 1855, 4to. THE ACADEMY.

Philadelphia:—Academy of Natural Sciences.

Journal, new series, vol. 2, part 4. Philadelphia, 1854, fol.
Proceedings, vol. 2, no. 2, vol. 6, nos. 7–12, and vol. 7, no. 1. *Ib.* 1853–54, 8vo. THE ACADEMY.

Stettin:—Entomologischer Verein.

Entomologische Zeitung, jahrgang 16. Stettin, 1855, 8vo.
Linnæa Entomologica, band 10. Berlin, 1855, 8vo. THE ASSOCIATION.

Turin:—Reale Accademia delle Scienze. Memorie, Serie 2, tomo 15. Torino, 1855, 4to. THE ACADEMY.

Vienna:—

Kaiserl. Akademie der Wissenschaften. Sitzungsberichte, Mathem.-naturw. Classe. Band 16, heft 2, and band 17, heft 1–3. Wien, 1855, 8vo. THE ACADEMY.

K. K. Geologische Reichsanstalt.

Abhandlungen, band 2. Wien, 1855, 4to.
Jahrbuch, jahrg. 6, nos. 1 & 2. *Ib.* 1855, 8vo. THE INSTITUTE.

Würzburg:—Physicalisch-medicinische Gesellschaft. Verhandlungen, band 6, hefte 2 & 3. Würzburg, 1855–56, 8vo. THE SOCIETY.

Alder (J.) and Hancock (A.) Monograph of the British Nudibranchiate Mollusca, pts. 1–4. London, 1845–48, fol. R. KIPPIST, Esq., Libr. L.S.

Backhouse (J. jun.) Monograph of the British Hieracia. York, 1856, 8vo. THE AUTHOR.

Baily (F.) Journal of a Tour in unsettled parts of North America in 1796 & 1797. London, 1856, 8vo. MISS BAILY.

Belcher (Sir E.) The last of the Arctic Voyages; being a Narrative of the Expedition in H.M.S. "Assistance," in search of Sir John Franklin, during the years 1852–54; with Notes on the Natural History, by Sir J. Richardson, Professor Owen, T. Bell, J. W. Salter, and L. Reeve. 2 vols. London, 1855, 8vo. THE PUBLISHER, L. REEVE, Esq., F.L.S.

TITLES. DONORS.

Bentley (R.) On a monstrosity of the *Papaver bracteatum*, 1856, 8vo. THE AUTHOR.

—— On the distinctive characters of the roots of *Aconitum Napellus* and *Cochlearia Armoracia*. 1856, 8vo. THE AUTHOR.

Brewer (J. A.) New Flora of the Neighbourhood of Reigate, Surrey.. London, 1856, 8vo. THE AUTHOR.

Burchell (W. J.) Travels in the Interior of Southern Africa. 2 vols. London, 1822–24, 4to. THE AUTHOR.

Dallas (W. S.) Natural History of the Animal Kingdom. London, 1856, 8vo. THE AUTHOR.

Dana (J. D.) Second Supplement to his Mineralogy, 1856, 8vo.

—— Science and the Bible: a Review of "The Six Days of Creation," by Prof. T. Lewis. Andover (Mass.), 1856, 8vo. THE AUTHOR.

Ferguson (W.) America, by River and Rail. London, 1856, 8vo. THE AUTHOR.

Hanley (S.) Ipsa Linnæi Conchylia: the Shells of Linnæus, determined from his MSS. and Collections. London, 1855, 8vo. THE AUTHOR.

Headland (F. W.) On poisoning by the root of *Aconitum Napellus*. London, 1856, 8vo. THE AUTHOR.

Hooker (J. D.) Botany of the Antarctic Voyage: Division 3. Flora of Tasmania; parts 1 & 2. London, 1855–56, 4to. THE AUTHOR AND PUBLISHER.

Johnson (C.) and Sowerby (J. E.) Fern-Allies of Great Britain, parts 3–6. London, 1856, 8vo. J. E. SOWERBY, Esq.

Johnston (G.) History of British Zoophytes. London, 1838, 8vo. WILLIAM YARRELL, Esq., V.P.L.S.

—— History of British Sponges and Lithophytes. Edinburgh, 1842, 8vo. T. C. JANSON, Esq., F.L.S.

Jones (T. R.) Notes on the Palæozoic Bivalved Entomostraca. no. 3. 1856, 8vo. THE AUTHOR.

Journals:—

Annales des Sciences Naturelles. Parties Zoologique et Botanique. 4ème série, tome 4, nos. 1–5. Paris, 1855, 8vo.

Annals and Magazine of Natural History. 2nd series, nos. 97–102. London, 1856, 8vo. RICHARD TAYLOR, Esq., Under-Sec. L.S.

Botanical Magazine; edited by Sir W. J. Hooker, K.H., F.R.S. and L.S. 3rd series, nos. 133–138. London, 1856, 8vo.

TITLES. DONORS.

Journal of Botany and Kew Garden Miscellany; edited by Sir W. J. Hooker, K.H. &c. Nos. 84–89. London, 1856, 8vo. THE PUBLISHER, L. REEVE, Esq., F.L.S.

Linnæa; herausgegeben von D.F.L.von Schlechtendal. Band 26, heft 3, and band 27, heft. 2–4. Halle, 1853–55, 8vo. THE EDITOR.

Literary Gazette, nos. 2033–2040, and New Series, nos. 1–18. London, 1856, 4to. THE PUBLISHER, L. REEVE, Esq., F.L.S.

Medical Independent, and Monthly Review of Medicine and Surgery; by Drs. Goadby, Kane, and Robinson, nos. 1–3. Detroit, U.S., 1856, 8vo. HENRY GOADBY, M.D., F.L.S.

Nya Botaniska Notiser, nos. 9–12 för 1854, and nos. 1–12 for 1855. Utgifne af K. F. Thedenius. Stockholm, 1854-56, 8vo. THE EDITOR.

Pharmaceutical Journal and Transactions; edited by Jacob Bell, Esq., F.L.S. Nos. 175–180. London, 1856, 8vo. THE EDITOR.

Philosophical Magazine and Journal of Science. 4th series, nos. 69–74. London, 1856, 8vo. RICHARD TAYLOR, Esq., Under-Sec. L.S.

Phytologist: new series, nos. 9–14. London, 1856, 8vo. THE PUBLISHER, W. PAMPLIN, Esq., A.L.S.

Quarterly Journal of Microscopical Science; by Edwin Lankester, M.D., and George Busk, Esq. Nos. 14 & 15. London, 1856, 8vo. THE MICROSCOPICAL SOCIETY.

Zoologist; edited by Edward Newman, Esq., F.L.S. Nos. 159–164. London, 1856, 8vo. THE EDITOR.

Kirby (Rev. W.) and Spence (W.) Introduction to Entomology. 7th edition. London, 1856, 8vo. WILLIAM SPENCE, Esq., F.R. & L.S.

Lindley (J.) Folia Orchidacea, vol. 1. London, 1852–55, 8vo. THE AUTHOR.

Lowe (E. J.) Natural History of Ferns, British and Exotic, parts 1–14. London, 1855–56, 8vo. THE AUTHOR.

Lucæ (J. C. G.) Symmetria et Asymmetria Organorum Animalitatis; imprimis Cranii. Marburgi, 1839, 4to. THE AUTHOR.

Lyell (Sir C.) On the successive changes of the Temple of Serapis. 1856, 8vo. THE AUTHOR.

Macarthur (Sir W.) and Moore (C.) Catalogue des Collections de bois indigènes de la Colonie "New South Wales," Australia. Paris (1855), 4to. WILLIAM MATCHWICK, Esq.

TITLES. DONORS.

Macgillivray (W.) Natural History of the Dee-side and Braemar; edited by Edwin Lankester, M.D., F.R.S. London, 1855, 8vo. H.R.H. PRINCE ALBERT, Hon.M.L.S.

Martineau (H.) Guide to the English Lakes; with an account of the Flowering Plants, Ferns, and Mosses of the district; by W. Dickinson, F.L.S. Windermere (1855), 8vo. WILLIAM DICKINSON, Esq.

Martins (Ch.) Mémoire sur la température des Oiseaux Palmipèdes du Nord de l'Europe. Montpellier, 1856, 4to. THE AUTHOR.

Martius (C. F. von) Beitrag zur Natur- und Literär-Geschichte der Agaveen. München, 1855, 4to. THE AUTHOR.

—— Tabulæ Vegetationis in Brasiliâ physiognomiam illustrantes, 1856, fol. THE AUTHOR.

Moore (T.) Ferns of Great Britain and Ireland (Nature-printed), parts 10–15. London, 1856, fol. HENRY BRADBURY, Esq.

—— Illustrations of Orchidaceous Plants, part 13. London, 1856, 8vo. THE AUTHOR.

Müller (F.) Report of his Journey to Omeo, 1854, ½ sheet; and

—— Annual Report, as Government Botanist, for 1854. Melbourne, 1855, fol. H.M. GOVERNMENT.

Planchon (J. E.) Des Hermodactes, au point de vue Botanique et Pharmaceutique. Paris, 1856, 4to. THE AUTHOR.

Radlkofer (L.) Die Befruchtung der Phanerogamen. Leipzig, 1856, 4to. THE AUTHOR.

Salter (T. B.) Monthly Lists (for Jan. Feb. and April, 1856) of the plants flowering in the open air in Ryde and the neighbourhood. THE AUTHOR.

Shuttleworth (R. J.) Notitiæ Malacologicæ: oder, Beiträge zur nähern Kenntniss der Mollusken. Heft 1. Bern, 1856, 8vo. THE AUTHOR.

Smith (W.) Synopsis of the British Diatomaceæ, the plates by T. West. vol. 2. London, 1856, 8vo. THE AUTHOR.

South (Sir J.) Letter in reply to the Obituary Notice of the late Rev. R. Sheepshanks. London, 1856, 8vo. THE AUTHOR.

Ville (G.) Recherches expérimentales sur la Végétation. Paris, 1856, 8vo. THE AUTHOR.

Walker (F.) Insecta Saundersiana. *Diptera*, parts 2 & 5. London, 1850–56, 8vo. W. W. SAUNDERS, Esq., F.L.S.

—— Insecta Britannica. *Diptera*. vol 3. *Ib.* 1856, 8vo. T. C. JANSON, Esq., F.L.S.

TITLES. DONORS.

Wrottesley (Lord) Address read at the Anniversary Meeting of the Royal Society, Nov. 30, 1855. London, 1855, 8vo.
THE ROYAL SOCIETY.

Yates (J.) Narrative of the Origin and Formation of the International Association for obtaining a uniform Decimal System of Measures, Weights, and Coins. 2nd edition. London, 1856, 8vo. THE AUTHOR.

Anon. Correspondence relating to the Lancet Sanitary Commission; with an appendix of documents. London, 1856, 8vo.
Dr. HASSALL.

DONATIONS

TO THE

MUSEUM OF THE LINNEAN SOCIETY.

[*Continued from page* xvi.]

DONATIONS. DONORS.

Photographic Portraits of Thomas Bell, Esq., Pres.L.S.; Robert Brown, Esq., V.P.; Francis Boott, Esq., M.D., V.P.; William Yarrell, Esq., V.P.; J. S. Bowerbank, Esq., F.L.S.; and N. B. Ward, Esq., F.L.S. Messrs. MAULL and POLYBLANK.

Dried Specimens of Aretic Plants, collected by Dr. Rae.
Sir JOHN RICHARDSON, C.B., F.R. & L.S.

Dried Specimens of about 130 species of East Australian Plants, collected by Dr. Ferdinand Müller. Dr. MÜLLER.

Cluster of the fruit of *Alpinia Renealmia*? from Jamaica.
G. ROBERTS, Esq., through D. HANBURY, Esq., F.L.S.

Specimens of the fruit of *Paulownia imperialis*, Sieb. & Zucc., ripened during the last summer in the open air at Paris.
WILLIAM MATCHWICK, Esq.

Specimen (in spirit) of *Sphæria militaris*, growing from the chrysalis of an insect; found by the Rev. C. A. Johns in June, 1855, among dead leaves, in Buckleigh Vale, Devon.
Rev. C. A. JOHNS, B.A., F.L.S.

pubescent. Hind wings greyish. Length of the body 3½ lines; of the wings 8 lines.

Singapore.

Subtrib. SERRIPEDES, *Amyot et Serv.*

Coh. TETTIGONIDES, *Amyot et Serv.*

Gen. TETTIGONIA, *Germar.*

61. Tettigonia farinosa, *Fabr. Syst. Rhyn.* 70. 41. *T. brevifrons*, Walk. Cat. Homopt. 754. 41.—*T. nigrifrons*, Signoret, Ann. Soc. Ent. Fr. 3me sér. i. 671. 123. pl. 21. f. 14.

Malacca and Singapore. Inhabits also Java, Pulo-Pinang, and Sumatra.

M. Signoret apparently describes the male of this species as *T. farinosa*, and the female as *T. nigrifrons*.

62. Tettigonia ferruginea, *Fabr. Syst. Rhyn.* 69. 36. (Cicada.)

Singapore. Inhabits also Hindostan, Java, the Philippine Isles, and China.

63. TETTIGONIA TRIPARS, n. s. Læte rufa subtùs ænea, capite brevi rotundato vittis duabus nigris, fronte testaceâ margine nigricante, abdomine obscurè rufo fasciis nigricantibus apice æneo, pedibus testaceis, tarsis nigris, alis anticis testaceis glaucescentibus basi rufis, posticis fuscis.

Bright red, dark æneous beneath. Head short, rounded, nearly semicircular; vertex with two black stripes; front dull testaceous, with a blackish border. Abdomen dull dark red, with blackish bands; tip æneous. Legs dark testaceous; tarsi black. Fore wings dull testaceous, with a glaucous bloom, bright red at the base. Hind wings brown. Length of the body 5 lines; of the wings 10 lines.

Malacca.

64. TETTIGONIA SUAVISSIMA, n. s. Nigra subtùs alba, capite brevi-conico vittâ guttisque duabus nigris, thoracis lateribus luteis, pectore maculis nigris, abdomine luteo maculis lateralibus fasciâ rufâ apice albo, alis anticis fuscis apices versus pallidioribus strigâ obliquâ rufâ anticè limpidis costâ luteâ, posticis fuscis apud costam limpidis basi nigricantibus.

Nearly allied to *T. semiclara*, Signoret, and to *T. stellata*, Sign., and forming with them a distinct group in the genus. Black, white beneath. Head short-conical, rounded in front, white with a black stripe and two black dots. Thorax luteous on each side. Pectus with black spots. Abdomen luteous with black spots on each side, red towards the tip which is white. Legs white. Fore wings dark brown, paler brown with an oblique red streak towards each tip, interruptedly limpid along the costa which is luteous. Hind wings brown, limpid along the costa, blackish at the base. Length of the body 4 lines; of the wings 10 lines.

Singapore.

65. TETTIGONIA JOCOSA, n. s. Rufa subtùs alba, capite albo brevi rotundato lateribus nigris, thorace vittis quinque testaceis duabusque albis, pedibus albis, alis anticis albo-vittatis fasciâ luridâ basi testaceis apice fuscis, posticis cinereis.

Red, white beneath. Head white, short, rounded, nearly semicircular; front

black on each side. Thorax with five testaceous stripes and with two white stripes. Legs white. Fore wings with several various white stripes, testaceous at the base, lurid towards the tips which are brown. Hind wings dark grey. Length of the body 3 lines; of the wings 7 lines.
Mount Ophir.

Coh. SCARIDES, *Amyot et Serv.*

Gen. LEDRA, *Fabr.*

66. LEDRA CULTELLIFERA, n. s. Testacea punctis pallidioribus, capite conico, scutello attenuato, oviductu fulvo apice nigro, alis anticis subtuberculatis, posticis limpidis.
Testaceous. Head and thorax with minute paler dots. Head conical, broader than long. Scutum about twice broader than long. Scutellum attenuated and acuminated at the tip. Oviduct tawny, with a black tip. Fore wings very minutely tuberculate. Hind wings limpid. Length of the body 6½ lines; of the wings 12 lines.
Singapore.

67. LEDRA CONIFERA, n. s. Fulva tuberculis pallidis, subtùs testacea, capite conico, alis anticis testaceis venis ex parte rufescentibus, posticis limpidis.
Tawny, testaceous beneath. Head and thorax thickly covered with very minute pale tubercles. Head conical, hardly broader than long. Scutum not twice broader than long. Scutellum acuminated. Fore wings testaceous, very minutely tuberculated; veins partly reddish. Hind wings limpid. Length of the body 6 lines; of the wings 10 lines.
Singapore.

68. LEDRA NIGRILINEA, n. s. Testacea subpunctulata, capite scutique lateribus nigro marginatis, capite brevi-conico, alis posticis limpidis.
Testaceous, very minutely punctured. Head and sides of the scutum bordered with black. Head short-conical, twice broader than long. Scutum not twice broader than long. Scutellum acuminated. Hind wings limpid. Length of the body 3½ lines; of the wings 7 lines.
Singapore.

Gen. PENTHIMIA, *Germar.*

69. PENTHIMIA CASTANEA, n. s. Ferruginea lævis nitens, capite anticè subtùsque pectoris margine antico maculisque duabus nigris, pedibus nigris, tibiis spinosissimis, alis anticis apices versus luridis maculis nigris.
Ferruginous, smooth, shining. Head black in front and beneath. Pectus black in front and with a black spot on each side behind. Legs black; tibiæ very spinose. Fore wings lurid, and with black spots towards the tips. Length of the body 2½ lines; of the wings 5 lines.
Malacca.

Coh. IASSIDES, *Amyot et Serv.*

Gen. ACOCEPHALUS, *Germar.*

70. Acocephalus olivaceus, *Walk. Cat. Homopt.* pt. 3. 846. 1.
Malacca. Inhabits also the Philippine Islands.

Gen. Cœlidia, *Germar.*

71. Cœlidia guttivena, n. s., fœm. Nigro-ænea, capite viridi-testaceo, verticis guttis duabus frontisque vittis duabus rufis, thorace punctis testaceis, pectore abdomineque testaceis ex parte nigris, pedibus testaceis, tibiis tarsisque apice nigris, alis anticis hyalino-bifasciatis apicibus semihyalinis venis nigris luteo-guttatis, posticis cinerascentibus.

Female. Blackish-æneous. Head greenish testaceous, with two red spots on the vertex, and with two red stripes in front. Thorax thickly covered with testaceous points. Pectus and abdomen testaceous, partly black. Legs testaceous; tips of the tibiæ and of the tarsi black. Fore wings with two hyaline bands, and with semihyaline tips; veins black, with very numerous luteous dots. Hind wings greyish. Length of the body 3½ lines; of the wings 8 lines.

Malacca.

72. Cœlidia punctivena, n. s., fœm. Nigro-ænea, capite testaceo strigis tribus abbreviatis nigris, thorace punctis testaceis, pectore et abdomine nigris ex parte testaceis, pedibus nigricantibus, alis anticis testaceo-guttatis venis luteo-guttatis, posticis cinerascentibus.

Female. Blackish-æneous. Head dull testaceous, with three short black streaks between the eyes. Thorax thickly covered with testaceous points. Pectus and abdomen black, partly testaceous. Legs blackish. Fore wings with numerous minute testaceous dots between the veins which are black, with minute luteous dots. Hind wings greyish. Length of the body 4 lines; of the wings 9 lines.

Malacca.

Ord. PHYTOPHTHIRES, *Burmeister.*

Fam. COCCIDÆ, *Leach.*

Gen. Monophlebus, *Leach.*

73. Monophlebus atripennis, *Klug, Handb.* ii. 80.

Malacca and Singapore. Inhabits also Hindostan.

Description of Plates.

Plate III.

Fig. 1. *Eupilis albilineola*, p. 93; 1*a*, head and rostrum seen in front; 1*b*, the same seen sideways; 1*c*, the extremity of the body seen sideways.

Fig. 2. *Micreune formidanda*, p. 94.

Fig. 3. *Benna capitulata*, p. 90; 3*a*, the head and rostrum seen in front; 3*b*, the same seen sideways; 3*c*, the abdomen seen beneath.

Fig. 4. *Cromna acutipennis*, p. 85; 4*a*, the head and rostrum seen in front; 4*b*, the same seen sideways; 4*c*, the abdomen seen sideways.

Fig. 5. *Colobesthes marginata*, p. 92; 5*a*, the head and rostrum seen in front; 5*b*, the same seen sideways; 5*c*, the abdomen seen sideways.

PLATE IV.

Fig. 1. *Colsa costæstriga*, p. 96; 1*a*, the head and rostrum seen in front; 1*b*, the same seen sideways.

Fig. 2. *Bidis notivena*, p. 88; 2*a*, the head and rostrum seen in front; 2*b*, the same seen sideways.

Fig. 3. *Conna guttifera*, p. 90; 3*a*, the head and rostrum seen in front; 3*b*, the same seen sideways.

Fig. 4. *Elica latipennis*, p. 86; 4*a*, the head and rostrum seen in front; 4*b*, the same seen sideways.

Fig. 5. *Daradax fusipennis*, p. 86; 5*a*, the head and rostrum seen in front; 5*b*, the same seen sideways; 5*c*, the extremity of the abdomen seen sideways.

Fig. 6. *Euria lurida*, p. 88; 6*a*, the head and rostrum seen in front; 6*b*, the same seen sideways; 6*c*, the extremity of the abdomen seen sideways.

On the Occurrence of *Sepia biserialis* in Cornwall.

By JONATHAN COUCH, Esq., F.L.S. &c.

[Read March 4th, 1856.]

IT appears from the "History of British Mollusca," by Professor E. Forbes and Mr. Hanley (vol. iv. p. 241, and Pl. P.P.P.), that the *Sepia biserialis* is regarded as of very rare occurrence in Britain; one specimen only of its shell or plate having been found in England and three in Ireland. The English specimen was obtained on the shore of the county of Northumberland. It may therefore be regarded as of some importance in the completion of our local fauna, to make the Linnean Society acquainted with the fact, that in the course of two days in the month of February of the present year I have myself found no less than ten specimens of the dorsal plate or shell of this animal, scattered among perhaps a hundred of those of the Common Bone or Burn Cuttle, *Sepia officinalis*.

My attention was attracted to these specimens by the beautiful pale pink colour of the dorsal aspect of the shell; and a very slight examination of the most perfect specimen I could find, compared with those of the common species, was sufficient to point out the decided distinction there is between them; but as the shell of this species is but little known, and those which have fallen into my hands are slightly different from what is described in the work above referred to, I beg leave to lay before the Society a more particular description than might otherwise be necessary.

The length of this shell, as described by Professor Forbes, was

2½ inches, and the breadth (I suppose without the membranous wing) was ⅓ths of an inch; but in the most perfect of my specimens, which however is defective at its blunt end, the length is 4 inches, and the breadth, including the membranous border, 1⅛ inch. The form is much more slender than in the common species, and, as it approaches the mucro or spur, may be described as lancet-shaped. The spur projects much more considerably than in the *Sepia officinalis*, although in the latter I find a difference in different specimens. In the *S. biserialis* it advances ¼th of an inch beyond the membranous border in a straightforward direction, whereas in the *S. officinalis* it is depressed and bent inward. The membranous border at this part is also turned inward, so as to enclose a cavity, and conceal the narrower portion of the shell. The structure of this spur in the *S. biserialis* is also different; for while that of the common species is for the most part hooked, round and simple, in the *S. biserialis* it is slightly lobed or keeled. I have not been able to assure myself of its shape at the point, as in my most perfect specimen it was a little injured.

In addition to these well-marked distinctions, the rarer species is smooth on its dorsal aspect at that part where the more common is covered with a decided graining. The transverse striæ are also much more numerous, and of a finer structure. Their direction also at the sides is not so bent towards the slender extremity.

It is still a subject of interesting inquiry whether the animal to which this shell or plate belongs is truly a native of our own waters, since it does not appear that any observer has ascertained its existence. It is to be observed, however, that although the whole of these specimens were injured, and most of them much broken, they were scarcely more so than were those of the common species, which is, beyond question, common on our coasts. The two species were lying together on the beach, as they had been left by the tide; and although there were at no great distance from them many specimens of the stalks of the American maize, clothed with perfect leaves—and although without heads of grain, still bearing clumps of the male flowers,—yet we cannot conclude from the presence of these foreign plants that the shells can have come to us from a considerable distance, since those of the *Sepia officinalis* certainly have not done so, and the leaves and stalks of the plants bear no marks of long immersion or of a distant voyage. It is probable that they were thrown overboard from

some ship, as is often the case with foreign productions which we find cast up on our shores.

Polperro, 1856.

Notice of the "Borer," a Caterpillar very injurious to the Sugar-Cane. By J. O. Westwood, Esq., F.L.S. &c.

[Read June 3rd, 1856.]

[Abstract.]

Mr. Westwood gave an account of the natural history of the "Borer," or caterpillar of a moth which is at the present time doing immense damage to the sugar-canes in the island of Mauritius. A committee had been formed in the island, composed of the chief planters and scientific individuals, for the purpose of investigating the subject, and from the able report which they had drawn up, it appears that the insects were in all probability imported with a cargo of new cane plants from the island of Ceylon several years ago, and that since that time the damage has been rapidly extending, and now threatens the entire destruction of the plantations. The female insect deposits her eggs in the axils of the young leaves, and the larvæ as soon as hatched bore into the stem, forming long galleries filled with the excrement of the insect, and which have the effect of bringing the stem into such a state of disease, that no crystallization will take place, and the plant becomes quite useless even for making rum. The entire transformations of the insect are effected in about six weeks, so that there are at least six successive generations in the course of a year. It appears that the chrysalis state is passed in a slight cocoon spun amongst the dead leaves of the plant; and the committee, after reviewing various proposals suggested for the destruction of the insect, had come to the conclusion that a well-organized system of burning the infested canes, as well as all loose rubbish and leaves in the plantation, was the only practicable means of getting rid of the enemy. Dr. Ulcoq, an extensive sugar-cane planter in the island, who was present at the meeting, confirmed the details contained in the report, and begged for any suggestions which could be offered by scientific men in this country for the purpose of remedying the evil. He had already been in communication with M. Guérin-Méneville and other naturalists in Paris.

Several of the members present took part in the discussion

upon the subject, and especially dwelt on the care necessary in the selection and treatment of the cuttings of the cane-tops for future plantations. The destruction of the eggs and young larvæ attached to such shoots would be effected if the latter were kept immersed in damp furrows, but the nature of the soil of the island prevented such a process; their immersion in a liquid capable of destroying the insect embryo without hurting the plant was also insisted upon; as well as the placing of the cuttings for a time in a close atmosphere saturated with the fumes of prussic acid arising from bruised laurel-leaves, which would certainly destroy the insect.

From the account given of this Mauritian borer, it appears identical with the borer of the West Indian plantations described by Fabricius under the name of *Phalæna saccharalis*, and by the Rev. L. Guilding under that of *Diatræa Sacchari* in a memoir published in the Transactions of the Society of Arts, for which he received the Gold Ceres Medal from the Society.

Notice of a Specimen of Insect-wax from China.

By DANIEL HANBURY, Esq., F.L.S. &c.

[Read April 15th, 1856.]

[Abstract.]

MR. D. HANBURY exhibited a specimen of Chinese Insect-wax in the crude state, attached to the branch on which it had been formed by the insect, *Coccus Pe-la*, Westw.* (*C. sinensis*, Westw. Pharm. Journ. xii. 478).

The specimen was obtained by Dr. M'Cartee of Ningpo, at a spot about fourteen miles N.E. of that city. The exact locality is described as "three miles from Chin-hae, southerly, behind the first range of hills across the river,—in the direction of Ling-fung," where the trees supporting the wax-insect occur on the banks of the canals.

Dr. M'Cartee procured specimens for Mr. Fortune, which that gentleman has taken to India with the view of introducing the insect into that country. He also sent specimens to William Lockhart, Esq., of Shanghai, through whose kindness that exhibited was received.

It may be remarked that, according to the Chinese accounts

* Gardener's Chronicle for Aug. 20, 1853 (p. 532).

the trees upon which the wax-insect lives are of two or three species. Of one of these, resembling an ash, a dried specimen was on the table. Mr. Lockhart has in his garden at Shanghai a small wax-tree of this species which he hopes shortly to colonize with the wax-insect. The tree has not yet flowered, and its botanical position is as yet undetermined. A living plant of the same species was brought to England by Mr. Fortune, from whose hands it passed into those of Messrs. Rollisson and Sons of Tooting.

Specimens of the manufactured insect-wax from China were also on the table.

Note on Insects producing Wax from Port Natal and China.

By J. O. Westwood, Esq., F.L.S. &c.

[Read April 15th, 1856.]

The wax-insect from Natal, exhibited by Mr. W. W. Saunders, is the female of a large species of *Coccus*, analogous to the *Coccus ceriferus*; each female being about the size of a pea, and of a dark chestnut colour, but encased in a solid layer of white waxy matter nearly a quarter of an inch thick, so as to make the entire insect as large as a boy's marble; the under side being flattened, or rather concave, so as to fit the convex surface of the branch on which they are found. The size of the insect would render it easy of observation, and the thickness of the wax would make it a more important object of commerce than the wax-insects of South America.

The Chinese wax-insect, of which so fine a specimen on the branch has been exhibited by Mr. Daniel Hanbury, differs from the latter by the waxy matter being deposited over the surface of the branch, and not confined to a coating of the insect. The specimens submitted to my examination are probably of considerable age, as they have been much deteriorated in a commercial point of view, by being attacked by other insects, namely a species of ant, of which I found the heads and other parts of several specimens; and a species of moth, of which I found portions of many chrysalides; the larvæ of which, I do not doubt, had devoured the animal matter of the *Cocci*, as well as burrowed into the wax. There were also some fragments of a *Curculio* (*Otiorhynchus*?), but these, I suppose, must have been taken accidentally on the trees in collecting the *Cocci*.

Catalogue of the Dipterous Insects collected at Sarawak, Borneo, by Mr. A. R. Wallace, with Descriptions of New Species. By Francis Walker, Esq., F.L.S.

[Received Sept. 15, 1856.]

Fam. MYCETOPHILIDÆ, *Haliday*.

Gen. Sciara, *Meigen*.

Div. A. a. *Meig.* vi. 305.

1. Sciara laticornis, n. s., mas et fœm. Nigra, antennis validis, thorace nitido. Mas. Alis subnigricantibus. Fœm. Abdomine ferrugineo, alis nigricantibus.

Male and Female. Black. Antennæ stout. Thorax shining. *Male.* Wings slightly blackish. *Female.* Abdomen ferruginous. Wings blackish. Length of the body 3–4 lines; of the wings 5–6 lines.

2. Sciara solita, n. s., fœm. Nigra, antennis gracilibus, thorace abdominisque apice subnitidis, pedibus piceis, alis subnigricantibus.

Female. Black. Antennæ slender. Thorax and tip of the abdomen slightly shining. Legs piceous. Wings slightly blackish. Length of the body 1¼ line; of the wings 3 lines.

Fam. CECIDOMYZIDÆ, *Haliday*.

Gen. Cecidomyia, *Latreille*.

3. Cecidomyia deferenda, n. s., fœm. Fusca, capite nigro, thorace rufescente, pedibus testaceis, alis albidis, venis halteribusque testaceis.

Female. Brown. Head black. Thorax reddish. Legs testaceous. Wings whitish, ciliated; veins and halteres pale testaceous; subcostal vein ending at a little before the middle of the costa; cubital vein ending at the tip of the wing; hind branch of the anal vein straight, and proceeding obliquely to the hind border. Length of the body 1¾ line; of the wings 3¼ lines.

Fam. BIBIONIDÆ, *Haliday*.

Gen. Plecia, *Hoffmansegg*.

4. Plecia dorsalis, *Walk.* See page 5.

5. Plecia subvarians, n. s., mas et fœm. Atra. Mas. Thorace rufo, alis subnigricantibus. Fœm. Thorace rufescente, alis nigricantibus.

Male and Female. Deep black. *Male.* Thorax bright red. Wings slightly blackish. *Female.* Thorax dull red. Wings blackish. Length of the body 1½–2 lines; of the wings 4–5 lines.

This species may be distinguished from *P. dorsalis* by its narrower wings.

Fam. CULICIDÆ, *Haliday*.

Gen. Culex, *Linn.*

6. Culex fuscanus, *Wied.* See page 5.

Fam. TIPULIDÆ, *Haliday*.

Gen. Limnobia, *Meigen*.

Div. n.

Veins of the wings like those of Div. S. *Meig.* (*Zweifl.* i. 147. pl. 4. f. 17), with the exception of the subcostal vein, which is not connected with the costal, but emits a veinlet at its tip to the radial.

7. Limnobia impressa, n. s., fœm. Fusca, capite nigro, thoracis lateribus testaceo-marginatis, pectore cano, abdomine lutescente fasciis fuscis, pedibus pallidè fuscescentibus, genubus testaceis, alis subcinereis venis nigris.

Female. Brown. Head and antennæ black. Lateral segments of the thorax with testaceous borders. Pectus hoary. Abdomen somewhat luteous, with brown bands. Legs slender, pale brownish; knees testaceous. Wings greyish; veins black. Length of the body 4½ lines; of the wings 8 lines.

Div. n.

Veins of the wings much like those of Div. E. *Meig.* (*Zweifl.* i. 125. pl. 6. f. 2), but the veinlet which connects the subcostal vein with the radial is far beyond the base of the fork of the latter, the cubital parts from the radial at some distance from the veinlet which connects it with the 3rd externo-medial, and the veinlet between the 3rd externo-medial and the subanal is very near the base of the discal areolet.

8. Limnobia rubrescens, n. s., mas. Ferrugineo-rufa, capite pedibusque nigris, pectore ventre femoribus basi coxisque rufescentibus, abdomine vittâ dorsali nigricante, alis fusco-cinereis venis stigmateque nigricantibus.

Male. Ferruginous red, paler beneath. Head, antennæ and legs black. Abdomen with a blackish stripe. Femora at the base and coxæ reddish. Wings brownish-grey; veins and stigma blackish. Length of the body 5 lines; of the wings 12 lines.

Div. n.

Veins of the wings much like those of Div. E. *Meig.* (*Zw.* i. 125. pl. 6. f. 2), but the veinlet which connects the subcostal vein with the radial is beyond the base of the fork of the latter, and the veinlet between the 3rd externo-medial vein and the subanal is opposite the middle of the discal areolet.

9. Limnobia pyrrhochroma, n. s., mas. Ochraceo-rufa, capite nigro?, pedibus nigris, femoribus basi coxisque fulvis, alis cinereis venis fuscis.

Male. Ochraceous red. Head black? Legs black, slender; femora towards the base and coxæ tawny. Wings grey; veins brown. Length of the body 3¼ lines; of the wings 8 lines.

Div. n.

Differs from all the other divisions of *Limnobia* by the contorted petiole of the radial and cubital veins, and by the radial vein which near its base forms an angle emitting a branch; externo-medial veins simple; discal areolet sub-

hexagonal, about twice longer than broad; veinlet between the 3rd externo-medial vein and the subanal near the base of the discal areolet.

10. LIMNOBIA ARGENTO-CINCTA, n. s., fœm. Nigra, antennis verticillato-pilosis, thorace nitido, abdomine fasciis argenteis, femoribus subclavatis, alis cinereis venis nigris nebulosis.

Female. Black. Antennæ verticillate-pilose. Thorax shining. Abdomen with silvery bands. Femora subclavate. Wings grey; veins black, slightly clouded with black. Length of the body 3½ lines; of the wings 6 lines.

Gen. PTEROCOSMUS, *Walk.*

Limnobia leucotelus and *L. plecioides*, p. 6, and other species, may be placed in this genus; the structure of their wing-veins differs somewhat from that of Meigen's Div. 1.

11. PTEROCOSMUS LUNIGERUS, n. s., mas. Ater, pedibus piceis, alis violaceo-nigricantibus apice testaceis maculâ discali sublunatâ albâ.

Male. Deep black. Legs piceous. Wings black, with violet reflections, testaceous at the tips, and with a white slightly curved discal white spot. Length of the body 5 lines; of the wings 8 lines.

12. PTEROCOSMUS INFIXUS, n. s., mas et fœm. Niger, thorace ferrugineo, abdomine antico flavescente, vittâ viridi, pedibus ferrugineis, femoribus tibiisque apice tarsisque nigris, alis violaceo-nigricantibus fasciâ brevi discali maculâque subapicali albis. Fœm. Abdominis segmentis posterioribus nigris fulvo marginatis, terebrâ ferrugineâ.

Male and Female. Black. Thorax and legs ferruginous. Abdomen towards the base yellowish, and with a green stripe. Tarsi and tips of the femora and of the tibiæ black. Wings blackish, with violet reflections, adorned with a short white discal band and with a subapical white spot.

Female. Hinder segments of the abdomen black, with tawny borders; oviduct ferruginous. Length of the body 5–6 lines; of the wings 10 lines.

13. PTEROCOSMUS OPTABILIS, n. s., mas. Ater, abdomine luteo basi fasciâque latâ posticâ atris, pedibus piceis, alis nigricantibus apice subcinereis fasciâ brevi discali albâ.

Male. Deep black. Abdomen luteous, black at the base, and with a broad black posterior band. Legs piceous, very slender. Wings blackish, with violet reflections, greyish hyaline at the tips, with a limpid mark by the interior angle, and with a short white discal band. Length of the body 3 lines; of the wings 6 lines.

14. PTEROCOSMUS COMBINATUS, n. s., fœm. Saturatè rufo-ferrugineus, capite nigro, abdomine fasciâ anticâ testaceâ, terebrâ pedibusque pallidè fulvis, alis violaceo-nigricantibus guttis costalibus et marginalibus maculâ discali lunulâque subapicali albis costâ testaceâ.

Female. Deep reddish ferruginous. Head and antennæ black. Abdomen with an anterior testaceous band. Oviduct, legs and halteres pale tawny. Tarsi blackish towards the tips. Wings blackish, with violet reflections, with a few marginal white dots, with two white spots (one discal, the other

subapical), and with a limpid mark on the hind part of the base; costa testaceous. Length of the body 8 lines; of the wings 12 lines.

15. PTEROCOSMUS DILUTUS, n. s. Saturatè rufus, capite nigro, antennis pedibus halteribusque testaceis, alis cinereis costâ testaceâ venulis transversis nigricante nebulosis maculâ discali guttisque marginalibus albis.

Nearly allied to the preceding species, of which it may be an immature variety. Deep red. Head black. Antennæ, legs and halteres pale testaceous. Tarsi a little darker towards the tips. Wings greyish, pale testaceous along the costa, with a discal white spot, and with some white marginal dots of various size; transverse veinlets slightly clouded with black. Length of the body 6 lines; of the wings 10 lines.

Gen. TIPULA, *Linn.*

16. Tipula pedata, *Wied. Auss. Zweifl.* i. 45. 7.

Inhabits also Java.

17. TIPULA VILIS, n. s., mas. Fusca, antennis subverticillato-pilosis, thorace ferrugineo nitido, femoribus basi fulvescentibus, alis subcinereis venis stigmateque nigris.

Male. Brown. Antennæ short, slightly verticillate-pilose. Thorax ferruginous, shining. Legs slender; femora somewhat tawny towards the base. Wings very slightly greyish; stigma and veins black. Length of the body 4 lines; of the wings 10 lines.

Fam. STRATIOMIDÆ, *Haliday.*

Gen. PTILOCERA, *Wied.*

18. Ptilocera quadridentata, *Fabr.* See page 7.

Gen. CLITELLARIA, *Meigen.*

19. Clitellaria varia, *Walk.* See page 7.

20. Clitellaria flaviceps, *Walk.* See page 7.

21. CLITELLARIA NOTABILIS, n. s., fœm. Nigro-cyanea, capite halteribusque pallidè testaceis, antennis pedibusque nigris, abdomine cyaneo, alis fuscis costam versus nigricantibus.

Female. Blackish-blue. Head pale testaceous. Antennæ and legs black. Thorax with a band and a stripe of grey tomentum. Abdomen blue, with grey tomentum beneath. Wings dark brown, blackish along the costa. Length of the body 5 lines; of the wings 10 lines.

Gen. CYCLOGASTER, *Macquart.*

22. CYCLOGASTER DETRACTA, n. s., fœm. Nigra, cinèreo-pubescens, antennis fulvis, aristâ albidâ elongatâ tenui, pedibus albidis, coxis femoribusque nigris, alis subcinereis venis sordidè albidis.

Female. Black, with grey down. Head shining. Antennæ tawny; arista

whitish, elongated, filiform. Legs whitish; coxæ and femora black. Wings very slightly greyish; veins dingy whitish. Halteres whitish. Length of the body 2 lines; of the wings 4 lines.

23. Cyclogaster infera, n. s., fœm. Nigra cinereo-pubescens, antennis nigris, articulo 1° fulvo, 3° valido; pedibus albidis, coxis femoribusque nigris, alis limpidis venis albidis.

Female. Black, with grey down. Head shining. Antennæ black; 1st joint tawny; arista stout. Legs whitish; coxæ and femora black. Wings limpid; veins whitish. Halteres white. Length of the body 2 lines; of the wings 4 lines.

Gen. Culcua, n. g.

Caput parvum; frons declivis. *Antennæ* breves; articulus 3^us^ rotundus; arista apicalis, longa, tenuis, setiformis. *Thorax* productus, longiconicus. *Scutellum* quadrispinosum. *Abdomen* crassum, subrotundum, thorace brevius et latius. *Pedes* breves, simplices. *Alæ* sat angustæ. *Mas. Oculi* suprà connexi.

Head small; front vertical. Antennæ short; 3rd joint round; arista long, slender, setiform, apical. Thorax elongate-conical, produced in front. Scutellum with 4 spines. Abdomen thick, nearly round, shorter and broader than the thorax. Legs short, slender, unarmed. Wings rather narrow; structure of the veins like that of *Clitellaria*.

Male. Eyes connected above.

24. Culcua simulans, n. s., mas. Nigra, capite albo-tomentoso, antennis fulvis, thorace et abdomine fasciis cinereo-pubescentibus, scutelli spinis fulvis, alis subcinereis fasciâ mediâ nonnunquam subinterruptâ apiceque latè nigricantibus.

Male. Black. Head with white tomentum. Antennæ tawny. Thorax and abdomen with bands of grey down. Scutellum with tawny spines. Legs pubescent. Wings slightly greyish, blackish towards the tips, and with a sometimes nearly interrupted blackish band. Length of the body 3–3½ lines; of the wings 5–6 lines.

This species also inhabits Malacca, and was accidentally omitted in the descriptions of the Malay species.

Gen. Evaza, n. g.

Corpus planum, subglabrum. *Caput* thoracis latitudine. *Antennæ* breves; articulus 1^us^ longiusculus; 3^us^ rotundus; arista apicalis, longa, gracilis, setiformis. *Thorax* ellipticus. *Scutellum* quadri-spinosum. *Abdomen* subellipticum, thorace paullò longius, vix latius. *Pedes* graciles, simplices. *Alæ* sat longæ, vix latæ. *Mas. Oculi* magni, suprà connexi.

Body rather flat, nearly bare. Head as broad as the thorax. Antennæ short; 1st joint rather long; 3rd round; arista long, slender, setiform, apical. Thorax elliptical. Scutellum with 4 rather long spines. Abdomen flat, elliptical, a little longer but hardly broader than the thorax. Legs slender, unarmed. Wings rather long, moderately broad; structure of the veins like that of *Clitellaria*.

Male. Eyes large, connected above.

25. Evaza dipars, n. s., mas. Nigra nitida, oculis rufis, antennis scutelli margine postico spinisque pedibus halteribusque pallidè flavescentibus, abdominis disco flavescente, alis cinereis stigmate venisque nigricantibus.

Male. Black, shining. Eyes red. Antennæ, hind border and spines of the scutellum, legs and halteres pale yellow. Arista black. Thorax with a testaceous line on each side. Disk of the abdomen yellowish. Wings grey; stigma and veins blackish, the latter testaceous at the base. Length of the body 3 lines; of the wings 6 lines.

Gen. Sargus, *Fabr.*

26. Sargus metallinus, *Fabr. Syst. Antl.* 258. 11.
Inhabits also Hindostan and Java.

27. Sargus luridus, *Walk.* See page 8.

28. Sargus latifascia, n. s., mas. Fulvus, antennis pectore abdomine pedibusque testaceis, abdomine fasciis latis nigris, pedum posticorum femoribus nigro vittatis, tibiis tarsisque nigris, his albido fasciatis, alis cinereis venis nigris basi fulvis.

Male. Tawny. Antennæ, pectus, abdomen and legs testaceous. Abdomen with broad black bands. Hind femora striped with black; hind tibiæ and hind tarsi black, the latter with a whitish band. Wings grey; veins black, tawny at the base. Length of the body 5 lines; of the wings 11 lines.

Fam. TABANIDÆ, *Leach.*

Gen. Tabanus, *Linn.*

29. Tabanus hybridus, *Wied. Auss. Zweifl.* i. 557. 31.
Inhabits also Macao.

30. Tabanus univentris, *Walk.* See page 9.
Var. Abdomen luteous-tawny, with an indistinct paler dorsal stripe.

31. Tabanus nexus, n. s., fœm. Ferrugineus subtùs canescens, callo piceo elongato, antennis nigris, thorace vittis subobsoletis rufescentibus, abdomine rufescente e maculis trigonis testaceis univittato, pedibus rufescentibus, femoribus anticis tibiis anticis apice tarsisque nigris, alis cinereis venis fusco marginatis, halteribus pallidè luteis.

Female. Very nearly allied to *T. univentris.* Ferruginous, somewhat hoary beneath. Callus piceous, long and slender. Proboscis black. Lancets ferruginous. Palpi brown. Antennæ black; angle of the 3rd joint small. Thorax with indistinct reddish stripes. Abdomen reddish, with a testaceous triangular spot on the hind border of each segment. Legs reddish; fore femora, tips of the fore tibiæ and tarsi black. Wings grey; veins black, clouded with brown. Halteres pale luteous. Length of the body 8 lines; of the wings 16 lines.

32. Tabanus fumifer, n. s., mas et fœm. Fuscus subtùs cinereus, abdomine ferrugineo-rufo apicem versus nigro segmentorum marginibus posticis testaceis, pedibus nigris, tibiis ferrugineo vittatis, alis fuscis. Mas. An-

tennis ferrugineis, alarum margine postico cinereo. Fœm. Antennis nigris, basi ferrugineis, abdomine maculis dorsalibus subtrigonis testaceis, alarum areolis cinereo vittatis.

Male and Female. Very nearly allied to *T. univentris.* Brown, cinereous beneath. Abdomen ferruginous-red, black towards the tip; hind borders of the segments testaceous. Legs black; tibiæ with ferruginous stripes. Wings brown; veins black. Halteres pale luteous. *Male.* Eyes æneous, and with very small facets in front. Antennæ ferruginous. Wings grey along the hind border, and with indistinct grey streaks on the areolets elsewhere. *Female.* Antennæ black, ferruginous at the base. Abdomen with a small nearly triangular spot on the hind border of each segment. Areolets of the wings with cinereous disks. Length of the body 6–7 lines; of the wings 12–14 lines.

33. Tabanus optatus, n. s., fœm. Ferrugineus subtùs canus, capite antico albido callo lanceolato, antennis nigris basi fulvis, thoracis lateribus testaceis, scutello cano, abdomine fulvo vittâ posticè dilatatâ nigrâ guttis dorsalibus albidis, pedibus nigris, tibiis anticis basi tibiisque posterioribus fulvis, alis nigro-fuscis apice lato margineque postico subcinereis maculâ mediâ sublimpidâ.

Female. Ferruginous, hoary beneath. Head whitish in front. Callus lanceolate. Proboscis black. Palpi testaceous. Antennæ black, tawny at the base; angle of the third joint acute, slightly elongated. Thorax with three darker lines; sides testaceous. Scutellum hoary. Abdomen tawny; hind borders of the segments beneath and on each side above testaceous; a black dorsal stripe which is dilated hindward; a whitish nearly triangular dot on the hind border of each segment. Legs black; fore tibiæ at the base and hinder tibiæ tawny. Wings blackish-brown; apical third part and hind border slightly cinereous; a nearly limpid discal spot before the middle; veins black. Halteres blackish. Length of the body 6 lines; of the wings 12 lines.

34. Tabanus simplicissimus, n. s., mas et fœm. Cinereus, callo trigono piceo, antennis fulvis, thoracis lateribus testaceis, abdomine testaceo apice nigricante, pedibus nigris. *Mas.* Tarsis posterioribus basi tibiisque posterioribus testaceis, tibiis anticis testaceis apice nigris, alis sublimpidis costâ venisque testaceis. *Fœm.* Femoribus apice fulvis, tibiis albidis, anticis apice nigris, tarsis posterioribus basi fulvis, alis cinereis apud costam luridis venis nigris basi ferrugineis.

Male and Female. Cinereous. Callus at the base of the antennæ broad, triangular, piceous. Palpi testaceous. Antennæ tawny; 3rd joint not dilated nor dentate. Sides of the thorax testaceous. Abdomen testaceous, blackish at the tip. Legs black.

Male. Eyes in front æneous, and with very minute facets. Tibiæ testaceous; fore tibiæ with black tips; hinder tarsi testaceous at the base. Wings nearly limpid, very slightly cinereous; costa, veins and halteres testaceous.

Female. Callus between the eyes long and slender. Femora with tawny tips; tibiæ whitish; fore tibiæ with black tips; hinder tarsi tawny towards the base. Wings cinereous, lurid along the costa; veins black, ferruginous towards the base. Length of the body 3½–4½ lines; of the wings 7–8 lines.

Gen. CHRYSOPS.

35. Chrysops dispar, *Fabr.* See p. 9. "Very abundant in the jungle at Sarawak."

36. Chrysops fasciatus, *Wied. Auss. Zweifl.* i. 198. 5.
Inhabits also Java.

37. CHRYSOPS FIXISSIMUS, n. s., fœm. Picea, capite thoracisque marginibus aureo-pubescentibus, capitis callo atro, facie ferrugineâ guttis duabus lateralibus nigris, antennis nigris basi fulvis, abdomine fulvo fasciis tribus nigricantibus, pedibus fulvis, tibiis subdilatatis nigricantibus, alis subcinerascentibus costâ apice fasciâque latâ nigro-fuscis.
Var. Abdomine bifasciato basi testaceo.
Female. Piceous. Head and borders of the thorax with gilded down. Head with a black shining callus above the antennæ; face ferruginous, shining, with a black dot on each side. Palpi tawny. Antennæ black, tawny at the base. Abdomen tawny, with three blackish bands. Legs tawny; femora and tarsi with piceous tips; tibiæ and fore tarsi black, the former slightly dilated. Wings very slightly cinereous, brown along the costa and at the tips, and with a broad brown band. Halteres testaceous.
Var. Abdomen testaceous at the base, with two bands, the fore one black, the hind one brown. Length of the body 3¼–4 lines; of the wings 7–8 lines.

Gen. HÆMATOPOTA, *Meig.*

38. Hæmatopota roralis, *Fabr. Syst. Antl.* 107. 2.
"Eyes above opal white, with black specks."

39. HÆMATOPOTA ATOMARIA, n. s., fœm. Nigro-picea, capite antico atro nitido, antennis nigris basi nitidis, abdominis marginibus posticis canis, tibiis albido cinctis, alis nigricantibus guttis plurimis annuloque unico albis.
Female. Piceous-black. Head black and shining in front. Palpi ferruginous. Antennæ black; 1st joint shining. Abdominal segments with hoary hind borders. Tibiæ with a whitish band on each. Wings blackish, with very numerous white dots, and with one white ringlet which is by the costa at two-thirds of the length. Length of the body 3 lines; of the wings 6 lines.

Fam. ASILIDÆ, *Leach.*

Subfam. DASYPOGONITES, *Walk.*

Gen. DASYPOGON, *Fabr.*

Subgen. MICROSTYLUM, *Macq.*

40. Dasypogon Vica, *Walk. Cat. Dipt.* pt. 2. 304.
Inhabits also Silhet.

41. DASYPOGON INCOMPTUS, n. s., mas. Nigro-cinereus subtùs canescens, facie ferrugineâ, antennis pedibusque nigris, thorace vittis quatuor canis,

abdomine maculis lateralibus canis apice rufescente, alis violaceo-nigricantibus.

Male. Blackish-cinereous, hoary beneath. Face bright ferruginous. Epistoma with six white bristles. Antennæ and legs black. Thorax with four hoary stripes. Abdomen with hoary spots along each side; tip reddish; appendages black, ciliated. Wings blackish, with violet reflections. Length of the body 9 lines; of the wings 16 lines.

Gen. Discocephala, *Macquart*.

42. Discocephala dorsalis, *Walk*. (See page 9.) mas. Thorace vittis duabus testaceis, abdomine piceo fasciis latis abbreviatis testaceis apice nigro-cupreo, pedibus testaceo-fulvis, femoribus tibiisque apice nigricantibus, femoribus posticis crassis spinosis.

Male. Thorax with two testaceous stripes. Abdomen piceous, with short broad testaceous bands, blackish cupreous towards the tip. Legs testaceous-tawny; femora and tibiæ with blackish tips; hind femora thick, spinose.

Subfam. Laphrites, *Walk*.

Gen. Laphria, *Fabr*.

43. Laphria Reinwardtii, *Wied*. See page 10.

44. Laphria alternans, *Wied*. See page 10.

45. Laphria notabilis, *Walk*. See page 10.

46. Laphria triangularis, *Walk*. *Cat. Dipt*. 2nd Ser. 3. 553. 138.
Inhabits also Sumatra.

47. Laphria constricta, *Walk*. *Cat. Dipt*. 2nd Ser. 3. 555. 142.
Inhabits also Sumatra.

48. Laphria aurifacies, *Macq*. See page 10.

49. Laphria inaurea, *Walk*. See page 11.

50. Laphria plana, *Walk*. See page 12.

51. Laphria unifascia, n. s., mas. Nigro-cuprea aureo-hirta, mystace nigro, abdominis lateribus fasciâ ventreque rufescentibus, alis nigricantibus basi latè sublimpidis venis nigris, halteribus fulvis.

Male. Blackish cupreous, partly clothed with gilded hairs. Face with very pale gilded tomentum. Mystax with some black bristles. Antennæ black; 3rd joint linear, acuminated, a little longer than the 1st and the 2nd together. Thorax with two bands of gilded tomentum. Abdomen reddish beneath and on each side, and with a very broad reddish band. Legs black, stout, pilose; hind femora very thick. Wings blackish, nearly limpid for one-third of the length from the base. Halteres tawny. Length of the body 5 lines; of the wings 8 lines.

52. Laphria comptissima, n. s., mas et fœm. Aureo-tomentosa, facie albo-tomentosâ, antennis pedibusque nigris, abdomine apicem versus nigro-purpureo, tibiis luteis, alis nigricantibus dimidio ferè basali subcinereo, halteribus fulvis apice fuscis.

Male and Female. Body covered with gilded tomentum. Mystax composed of several slender black bristles. Antennæ and legs black. Third joint of the antennæ nearly linear, slightly acuminated, hardly longer than the 1st and the 2nd together. Abdomen bare, shining and blackish-purple towards the tip. Legs rather stout; tibiæ luteous; hind tibiæ black towards the tips. Wings blackish, slightly greyish on nearly half the length from the base; veins black, tawny at the base. Halteres tawny, with brown knobs.

Male. Face with white tomentum.

Female. Face with pale gilded tomentum.

Length of the body 4½–5 lines; of the wings 8–9 lines.

53. LAPHRIA RUDIS, n. s., fœm. Nigra, capite postico pectoreque canotomentosis, facie fulvâ, thorace vittis duabus canis; abdomine cyaneonigro maculis lateralibus canis, alis nigricantibus basi latè subcinereis, halteribus fulvescentibus.

Male. Black. Head with hoary tomentum behind, thickly clothed beneath with testaceous hairs. Face tawny. Mystax composed of many black bristles. Thorax with two hoary stripes. Pectus hoary. Abdomen bluish-black, with hoary spots along each side. Legs stout, clothed with hoary and pale testaceous hairs, and with black bristles. Wings blackish, slightly greyish for more than one-third of the length from the base; veins black. Halteres somewhat tawny. Length of the body 6 lines; of the wings 11 lines.

54. LAPHRIA PRODUCTA, n. s., mas. Atra vix pilosa, facie aureo-tomentosâ, pectore cano, abdomine longiusculo punctis lateralibus canis, pedibus crassis, alis nigricantibus dimidio ferè basali subcinereo, halteribus testaceis.

Male. Deep black, hardly pilose. Face with pale gilded tomentum. Mystax with very few black bristles. Pectus with hoary tomentum. Abdomen somewhat long, with minute hoary dots along each side. Legs thick, rather short. Wings blackish, greyish for nearly half the length from the base; veins black. Halteres testaceous. Length of the body 4½ lines; of the wings 7 lines.

55. LAPHRIA LEPIDA, n. s., mas. Nigra aureo-pilosa, facie aureo-tomentosâ, thorace bivittato et bifasciato, abdomine aureo-rufo, pedibus crassis pilosis, alis nigricantibus triente basali subcinereo, halteribus testaceis.

Male. Black, clothed with gilded hairs. Face with gilded tomentum. Mystax with many gilded and with a few black bristles. Third joint of the antennæ linear, conical at the tip, longer than the 1st and the 2nd together. Thorax with two stripes and two bands of gilded tomentum. Pectus gilded. Abdomen with golden-red tomentum. Legs pilose; femora incrassated. Wings blackish, slightly cinereous for full one-third of the length from the base; veins black. Halteres testaceous. Length of the body 6 lines; of the wings 11 lines.

56. LAPHRIA COMPLETA, n. s., fœm. Nigra fulvo-pilosa, facie pectoreque aureo-tomentosis, abdominis apice glabro nigro-purpureo, pedibus robustis, alis fuscis triente basali pallidiore, halteribus testaceis.

Female. Black, clothed with tawny hairs. Face and pectus with gilded tomentum. Mystax with several gilded and with a few black bristles. Third joint of the antennæ elongate-fusiform, longer than the 1st and the 2nd together. Legs hairy; femora slightly thickened. Wings brown, paler towards the base; veins black. Halteres testaceous. Length of the body 6 lines; of the wings 12 lines.

57. LAPHRIA INCIVILIS, n. s., fœm. Nigra fulvo-tomentosa, facie subauratâ, pectore cano, abdominis lateribus cano-guttatis, tibiis basi fulvis, alis fusco-cinereis basi pallidioribus, halteribus testaceis.

Female. Black, thinly covered with tawny tomentum, not pilose. Face with slightly gilded tomentum. Mystax with very few black bristles. Pectus hoary. Hind borders of the abdominal segments with a hoary dot on each side. Legs slightly pilose; femora rather stout; tibiæ tawny, black towards the tips. Wings brownish-grey, paler at the base; veins black. Halteres testaceous. Length of the body 4½ lines; of the wings 8 lines.

58. LAPHRIA PARTITA, n. s., fœm. Nigra, facie albido-tomentosâ, thorace fusco-tomentosâ, pectore cano, abdomine nigro-purpureo, pedibus fulvis, tarsis tibiis apice genubusque posticis nigris, alis subfuscis aut subcinereis, halteribus testaceis.

Female. Black. Face with whitish tomentum, which is very slightly gilded. Mystax with several bristles of the same hue. Third joint of the antennæ fusiform, as long as the 1st and 2nd together. Thorax thinly covered with brownish tomentum. Pectus hoary. Abdomen purplish-black, with a very slight cupreous tinge; sides with brownish tomentum. Legs tawny; femora moderately stout; coxæ, trochanters, tarsi, tips of the tibiæ and hind knees black. Wings slightly cinereous or with a brownish tinge; veins black. Halteres testaceous. Length of the body 4 lines; of the wings 8 lines.

59. LAPHRIA INTERRUPTA, n. s., fœm. Nigra, facie aureo-tomentosâ, thoracis fasciis duabus interruptis pectoreque subaurato-tomentosis, abdomine nigro-æneo maculis tribus lateralibus fulvis, tibiis tarsisque testaceis apice nigris, alis nigricantibus dimidio basali subcinereo, halteribus testaceis.

Female. Black. Face with gilded tomentum. Mystax with a few gilded and very few black bristles. Thorax with two interrupted bands of very pale gilded tomentum, which also covers the pectus. Abdomen blackish-æneous, with three tawny tomentose spots on each side. Femora moderately thick; tibiæ and tarsi testaceous, black towards the tips. Wings blackish, very slightly greyish for half the length from the base; veins black. Halteres testaceous. Length of the body 4 lines; of the wings 8 lines.

60. LAPHRIA CINGULIFERA, n. s., fœm. Nigra, capite pectore thoracisque fasciis duabus interruptis pallidè aureo-tomentosis, abdominis segmentis apud margines posticos aurato-tomentosis, pedibus testaceis, femoribus nigro-vittatis, tibiis posticis apice tarsisque anticis nigris, tarsis posterioribus nigro-cinctis, alis cinereis, halteribus testaceis.

Female. Black. Head and pectus with very pale gilded tomentum. Thorax with two stripes and two interrupted bands of the same hue. Mystax with many pale gilded bristles. Third joint of the antennæ linear, slightly acuminated, very much longer than the 1st and the 2nd together. Ab-

domen with a gilded band on the hind border of each segment. Legs testaceous; femora hardly stout, with black stripes; hind trochanters and fore tarsi black; hind tibiæ with black tips; posterior tarsi with black bands. Wings cinereous; veins black. Halteres testaceous. Length of the body 6 lines; of the wings 11 lines.

61. LAPHRIA DETECTA, n. s., mas. Atra, capite postico pectoreque albido-tomentosis, thorace maculâ laterali pallidè aureo-tomentosâ, abdomine basi albo piloso maculis tribus lateralibus aurato-tomentosis, pedibus fulvis, femoribus nigro-vittatis, tarsis nigris basi fulvis, alis limpidis dimidio ferè apicali nigricante.

Male. Deep black. Head behind and pectus with whitish tomentum. Mystax with very few black bristles. Third joint of the antennæ nearly linear, elongate-conical towards the tip, very much longer than the 1st and the 2nd together. Thorax with a spot of pale gilded tomentum on each side, in front of the base of the wing. Abdomen with white hairs at the base, and with three spots of gilded tomentum on each side. Legs tawny; coxæ and trochanters black; femora rather thick, with black stripes, which are very short on the hind pair; tarsi black, tawny at the base. Wings limpid, blackish for nearly half the length from the tips; veins black, tawny in the limpid part. Halteres very pale yellow. Length of the body 6¼ lines; of the wings 11 lines.

Subfam. ASILITES, *Walk.*

Gen. TRUPANEA, *Macq.*

62. Trupanea Amorges, *Walk. Cat. Dipt.* pt. 2. 391 (Asilus); 2nd ser. pt. 3. 612. 102.

63. TRUPANEA INSERENS, n. s., mas et fœm. Nigra, fusco-tomentosa, facie pectoreque subauratis, mystace suprà albido subtùs nigro, antennis pedibusque nigris, thorace vittis quinque nigris, abdominis segmentis cano interruptè marginatis, alis fuscis.

Male and Female. Black, with brown tomentum. Face and pectus with pale, slightly gilded tomentum. Mystax with some whitish bristles above, and with very few black bristles beneath. Antennæ black; arista as long as the 3rd joint. Thorax with five black stripes. Abdomen rather slender, moderately long; hind borders of the segments with slightly interrupted hoary bands. Legs black; tibiæ ferruginous above, except towards the tips. Wings brown; veins black; 3rd externo-medial vein joining the 4th far from the base. Halteres tawny.

Male. Sexualia moderately large. *Female.* Abdomen attenuated, not stylate. Length of the body 6 lines; of the wings 9–10 lines.

Gen. ASILUS, *Linn.*

64. Asilus Barium, *Walk.* See p. 14.

65. ASILUS FLAGRANS, n. s., fœm. Piceus, capite pectoreque aureo-tomentosis, mystace aureo, antennis fulvis, thorace strigis duabus obliquis lateralibus vittisque duabus aureo-tomentosis, abdominis segmentis testaceo-

marginatis, pedibus fulvis, tibiis posticis femoribusque piceo-vittatis, tarsis posticis nigris, alis luridis triente apicali fusca.

Female. Piceous. Head and pectus with gilded tomentum. Mystax with several gilded bristles. Antennæ tawny; arista as long as the preceding joints together. Thorax with two oblique streaks on each side, and with two stripes of gilded tomentum. Abdomen moderately long, hardly stylate; hind borders of the segments testaceous. Legs tawny; femora and hind tibiæ mostly piceous above; hind tarsi black. Wings lurid; apical third part brown, which colour extends further along the hind border; veins black, tawny at the base; cubital vein forked at a little beyond half its length; hind fork very undulating; 3rd externo-medial vein joining the 4th at some distance from the border. Halteres tawny. Length of the body 5½ lines; of the wings 12 lines.

66. Asilus contortus, n. s., fœm. Niger, cinereo-tomentosus, facie albidâ, mystace suprà nigro subtùs albido, antennis nigris, thorace vittis duabus nigricantibus, pectore cano, abdomine subaureo piloso segmentis testaceo-marginatis, pedibus ferrugineis, femoribus tibiisque apice tarsisque nigris, alis luridis areolarum apicalium fuscarum discis pallidioribus.

Female. Black, with cinereous tomentum. Face prominent, whitish. Mystax with some black bristles above, and with many whitish bristles beneath. Antennæ black; arista as long as the preceding joints together. Thorax with two indistinct blackish stripes. Pectus hoary. Abdomen with slightly gilded hairs, moderately long, hardly stylate; hind borders of the segments testaceous; tip black, shining. Legs ferruginous; tarsi and tips of the femora and of the tibiæ black. Wings lurid; apical areolets brown, with pale disks; veins black; cubital vein forked at beyond half its length; fore fork angular near its base; hind fork very undulating; 3rd externo-medial vein joining the 4th near the border. Halteres tawny. Length of the body 6 lines; of the wings 13 lines.

Gen. Ommatius, *Illiger*.

67. Ommatius Hecale, *Walk.* See p. 14.

Gen. Leptogaster, *Meigen*.

68. Leptogaster tricolor, n. s., mas. Piceus, capite albido-tomentoso, thoracis vittis duabus posticè attenuatis pectorisque lateribus testaceis, abdomine nigro fasciis quinque flavis, pedibus flavis, tibiis posticis tarsisque apice nigris, tarsis posticis ferrugineis apice nigris, alis cinereis costâ luridâ, halteribus testaceis.

Male. Piceous. Head with whitish tomentum. Antennæ testaceous towards the base. Thorax with two stripes, which are attenuated hindward, and with the sides of the pectus testaceous. Abdomen black, with five yellow bands. Legs yellow; coxæ and knees black; hind femora striped with black beneath; hind tibiæ with black tips; hind tarsi ferruginous, with black tips. Wings grey, lurid along the costa; veins black. Halteres testaceous. Length of the body 7 lines; of the wings 11 lines.

69. Leptogaster inutilis, n. s., mas. Niger nitens, pectore cano, pedibus testaceis, femoribus tibiis et tarsorum articulis apice nigris, femoribus

posticis apices versus nigricantibus annulo subapicali testaceo, alis limpidis venis nigris triente basali infuscatis, halteribus testaceis apice fuscis.

Male. Black, shining. Pectus with hoary tomentum. Legs testaceous; tips of the femora, of the tibiæ, and of the joints of the tarsi black; hind femora mostly blackish, with a testaceous subapical band. Wings limpid; veins black, clouded with brown towards the base. Halteres testaceous, with brown knobs. Length of the body 2½ lines; of the wings 5 lines.

Fam. LEPTIDÆ, *Westw.*

Gen. LEPTIS, *Fabr.*

70. Leptis ferruginosa, *Wied. Auss. Zweifl.* i. 224. 6.

71. Leptis decisa, *Walk.* See p. 15.

Gen. CHRYSOPILA, *Macq.*

72. CHRYSOPILA MACULIPENNIS, n. s., mas et fœm. Picea, pectore testaceo cano-tomentoso, abdominis segmentis testaceo-fasciatis, pedibus testaceis, alis limpidis, fasciis tribus maculosis fuscis.

Male and Female. Piceous. Head in front and pectus with hoary tomentum. Proboscis, legs and halteres testaceous. Antennæ black. Abdomen with a testaceous band on the hind border of each segment. Wings limpid, with three irregular brown bands; 2nd and 3rd bands broad, connected, adorned with several limpid spots; veins black. Length of the body 2½ lines; of the wings 5 lines.

Fam. BOMBYLIDÆ, *Leach.*

Subfam. THEREVITES, *Walk.*

Gen. THEREVA, *Latr.*

73. THEREVA PRÆCEDENS, n. s., fœm. Nigra confertim cano-tomentosa, capite antico albo barbâque albâ, pedibus subpilosis, alis subcinereis venis nigris.

Female. Black, entirely covered with hoary tomentum. Head white and shining in front, clothed beneath with white hairs. Proboscis black and shining as usual. Legs slightly hairy. Wings slightly greyish; veins black. Length of the body 3½ lines; of the wings 5 lines.

Subfam. BOMBYLITES, *Walk.*

Gen. ANTHRAX, *Fabr.*

74. Anthrax Tantalus, *Fabr. Syst. Antl.* 124. 29.
Inhabits also Hindostan, Java and China.

75. Anthrax pennipes, *Wied. Auss. Zweifl.* i. 272. 23.
Inhabits also Java.

76. ANTHRAX SEMISCITA, n. s. (Group 10. *Dipt. Saund.* 167), mas. Nigro-picea cinereo nigroque pilosa, abdomine nigro apicem versus argenteo-

micante, alis nigricantibus dimidio apicali obliquè limpido guttis duabus (unâ anteriore exteriore, alterâ posteriore interiore) nigricantibus.

Very nearly allied to *A. bimacula*, Walk. *Male.* Blackish-piceous, with a few grey and black hairs. Abdomen black, brilliant silvery towards the tip. Wings obliquely blackish for half the length from the base, the blackish part very irregular in outline, and extending to $\frac{3}{4}$ths of the length of the costa; one blackish dot on the basal angle of the fore fork of the cubital vein, the other on the hind end of the veinlet between the 2nd and 3rd externo-medial veins; veins black. Halteres with whitish tips. Length of the body 4 lines; of the wings 11 lines.

77. Anthrax Satellitia, n. s. (Group 10. *Dipt. Saund.* 167), mas. Atra vix pilosa, alis nigricantibus plus triente apicali subobliquè limpidâ guttis tribus discalibus unâque apicali nigricantibus.

Male. Deep black, hardly pilose. Wings blackish, obliquely limpid for more than one-third of the length from the tips; the outline of the blackish part slightly denticulate; the limpid part containing four blackish dots, three discal and one apical, the middle discal dot much larger than the two others. Length of the body 3 lines; of the wings 8 lines.

Fam. DOLICHOPIDÆ, *Leach.*

Gen. Psilopus, *Meigen.*

78. Psilopus apicalis, *Wied. Auss. Zweifl.* ii. 227. 32.
Inhabits also Sumatra.

79. Psilopus robustus, *Walk.* See page 16.

80. Psilopus tenebrosus, *Walk.* See page 16.

81. Psilopus allectans, n. s., mas. Lætè cyaneo-viridis, antennarum articulo 3° fulvo, aristâ longissimâ apice albidâ, abdominis segmentis atro-fasciatis, pedibus testaceis, tarsis nigricantibus, alis obscurè fuscis posticè pallidioribus, venis halteribusque nigris.

Male. Bright bluish-green. Proboscis testaceous. Third joint of the antennæ tawny; arista longer than the body, whitish at the tip. Abdomen with deep black bands. Legs testaceous; tarsi blackish, paler towards the base. Wings dark brown, paler along the hind border; veins and halteres black; fore branch of the præbrachial vein nearly straight; discal transverse vein curved outward. Length of the body 3 lines; of the wings 5 lines.

82. Psilopus alliciens, n. s., mas. Lætè cyaneo-viridis, facie pectoreque argenteo-tomentosis, antennis testaceis, articulo 3° lanceolato, aristâ vix longâ, abdominis segmentis atro-fasciatis, pedibus testaceis, alis sublimpidis, venis halteribusque testaceis.

Male. Bright bluish-green. Face and pectus with silvery tomentum. Proboscis testaceous. Antennæ testaceous; 3rd joint lanceolate; arista black, less than half the length of the body. Abdomen with broad deep black bands, partly æneous towards the tip. Legs testaceous; tarsi darker towards the tips. Wings nearly limpid; veins and halteres testaceous; fore branch of the præbrachial vein much curved; discal transverse vein undulating. Length of the body $3\frac{1}{4}$ lines; of the wings 6 lines.

83. PSILOPUS ILLICIENS, n. s., mas. Lætè cyaneo-viridis, antennis nigris articulo 3° brevi, aristâ sat longâ, abdomine lætè viridi segmentis atro-fasciatis, pedibus nigris, tibiis fulvescentibus, alis cinereis apud costam fuscescentibus, venis halteribusque nigris.

Male. Bright bluish-green. Proboscis black. Antennæ black; 3rd joint short; arista more than half the length of the body. Abdomen emerald-green, with broad black bands. Legs black; tibiæ dull tawny. Wings grey, brownish along the costa; veins and halteres black; fore branch of the præbrachial vein curved; discal transverse vein undulating. Length of the body 3 lines; of the wings 6 lines.

84. PSILOPUS DELECTANS, n. s., mas. Lætè cyaneo-viridis, facie pectoreque argenteo-tomentosis, antennis nigris articulo 3° conico, aristâ sat longâ, abdomine lætè viridi segmentis nigro-fasciatis, pedibus nigris, alis subcinereis, venis halteribusque nigris.

Male. Bright bluish-green. Face and pectus with silvery tomentum. Proboscis black. Antennæ black; 3rd joint conical; arista black, more than half the length of the body. Abdomen bright green, with narrow black bands. Legs black. Wings greyish; veins and halteres black; fore branch of the præbrachial vein curved; discal transverse vein undulating. Length of the body 3½ lines; of the wings 6 lines.

85. PSILOPUS PROLICIENS, n. s., fœm. Lætè viridis robustus, capite cyaneo-viridi, facie pectore abdominisque lateribus argenteo-tomentosis, antennis nigris articulo 3° longi-conico, aristâ sat longâ, abdominis segmentis atro-fasciatis, pedibus nigris, alis cinereis maculâ costali fuscâ venis nigris, halteribus fulvis.

Female. Bright green, stout. Head bluish-green; face with silvery tomentum. Proboscis black. Antennæ black; 3rd joint elongate-conical; arista full half the length of the body. Thorax with three bright cupreous stripes. Pectus and sides of the abdomen with silvery tomentum. Abdomen with broad deep black bands. Legs black. Wings grey, with an elongated brown spot towards the middle of the costa; veins black; fore branch of the præbrachial vein much curved; discal transverse vein nearly straight. Halteres tawny. Length of the body 2½ lines; of the wings 5 lines.

86. PSILOPUS PROLECTANS, n. s., fœm. Lætè cyaneo-viridis, antennis nigris articulo 3° conico, aristâ longissimâ, abdomine apicem versus purpureo, pedibus nigris, alis obscurè fuscis fasciis tribus abbreviatis apiceque sublimpidis, venis halteribusque nigris.

Female. Bright bluish-green. Proboscis black. Antennæ black; 3rd joint conical; arista nearly as long as the body. Abdomen purple towards the tip. Legs black. Wings dark brown, with three nearly limpid bands which do not extend to the costa; 1st band dilated along the hind border to the base of the wing; 2nd very short; 3rd much longer; tips nearly limpid; veins and halteres black; fore branch of the præbrachial vein very much curved; discal transverse vein very deeply undulating, angular, and emitting a short stump in the middle. Length of the body 3 lines; of the wings 6 lines.

87. PSILOPUS COLLUCENS, n. s., fœm. Lætè viridi-cyaneus brevis latus, vertice purpureo, facie pectoreque albido-tomentosis, antennis nigris articulo

3° longi-conico, aristâ vix longâ, abdomine lætè viridi segmentis cupreo-fasciatis, pedibus nigris, tibiis testaceis, alis subcinereis, venis nigris, halteribus testaceis.

Female. Bright greenish-blue, short, broad. Vertex purple. Face and pectus with whitish tomentum. Proboscis black. Antennæ black; 3rd joint elongate-conical; arista about half the length of the body. Abdomen bright green, with cupreous bands. Legs black; tibiæ testaceous. Wings greyish; veins black; fore branch of the præbrachial vein very much curved; discal transverse vein almost straight. Halteres testaceous. Length of the body 1¼ line; of the wings 3 lines.

88. PSILOPUS DERELICTUS, n. s., mas. Lætè cyaneo-viridis gracilis, metathorace purpureo, abdomine lætè viridi segmentis cupreo-fasciatis, pedibus pallidè flavis, alis sublimpidis venis nigris, halteribus testaceis.

Male. Bright bluish-green, slender. Head wanting. Metathorax purple. Abdomen bright green, with cupreous bands. Legs pale yellow. Wings nearly limpid; veins black; fore branch of the præbrachial vein almost rectangular; discal transverse vein straight. Halteres testaceous. Length of the body 1¾ line; of the wings 3 lines.

Gen. DOLICHOPUS, *Latr.*

89. DOLICHOPUS ELECTUS, n. s., fœm. Lætè viridis robustus, capite antico albo, antennis pedibusque nigris, thoracis margine æneo, abdomine æneo-viridi maculis lateralibus albo-tomentosis, tibiis spinosissimis obscurè testaceis apice nigris, alis fusco-cinereis venis nigris, halteribus fulvis.

Female. Bright green, stout. Head white in front. Antennæ black; arista rather stout. Thorax æneous in front and on each side. Abdomen dark æneous-green, with spots of white tomentum along each side. Legs black; tibiæ dull testaceous with black tips, very spinose. Wings brownish-grey; veins black; præbrachial vein forming a very obtuse angle, nearly straight from thence to its tip; discal transverse vein straight, upright. Halteres tawny. Length of the body 2½ lines; of the wings 5 lines.

90. DOLICHOPUS ALLIGATUS, n. s., mas. Æneo-viridis sat gracilis, capite argenteo, antennis nigris, pectore cano, abdomine obscurè æneo, pedibus fulvis, tibiis subspinosis, tarsis nigricantibus basi fulvis, femoribus posterioribus nigris, mediis apice fulvis, alis fuscis sat latis venis nigris, halteribus fulvis.

Male. Æneous-green, rather slender. Head with silvery-white tomentum. Antennæ black. Pectus hoary. Abdomen dark æneous. Legs tawny; tibiæ slightly spinose; tarsi blackish, tawny at the base; posterior femora black; middle femora with tawny tips. Wings brown, rather broad, darker along the apical half of the costa; veins black; præbrachial vein and discal transverse vein straight. Halteres tawny. Length of the body 2½ lines; of the wings 5 lines.

91. DOLICHOPUS COLLECTUS, n. s., mas. Lætè viridi-cyaneus gracilis, facie perangustâ, antennis nigris, abdomine cyaneo-purpureo, pedibus testaceis, tibiis vix spinosis, femoribus posticis nigris, tibiis posticis nigricantibus apice testaceis, alis subcinereis latiusculis apud costam fuscescentibus, halteribus testaceis.

Male. Bright greenish-blue, slender. Face extremely narrow. Antennæ black. Abdomen dark bluish-purple. Legs testaceous; tibiæ hardly spinose; hind femora black; hind tibiæ blackish, with testaceous tips. Wings greyish, rather broad, brownish along the costa; veins black; præbrachial vein hardly curved, forming an almost imperceptible angle at its junction with the discal transverse vein which is nearly straight. Halteres testaceous. Length of the body 1¾ line; of the wings 3½ lines.

Gen. Diaphorus, *Meigen.*

92. Diaphorus delegatus, n. s., fœm. Viridis albido-tomentosus, antennis nigris, abdomine æneo-viridi basi testaceo, pedibus testaceis, tarsis nigris, tibiis posticis fuscescentibus, alis subcinereis venis nigris, halteribus testaceis.

Female. Green, with whitish tomentum. Proboscis and antennæ black. Abdomen æneous-green, testaceous towards the base. Legs testaceous; tarsi black; hind tibiæ brownish. Wings greyish; veins black; præbrachial vein and discal transverse vein almost straight. Halteres testaceous. Length of the body 2½ lines; of the wings 4 lines.

Fam. SYRPHIDÆ, *Leach.*

Gen. Ceria, *Fabr.*

93. Ceria Javana, *Wied.* See page 17.

Gen. Eristalis, *Latr.*

94. Eristalis niger, *Wied.* See page 17.

95. Eristalis arvorum, *Fabr. Syst. Antl.* 235. 14.
Inhabits also Java and China.

96. Eristalis Andræmon, *Walk. Cat. Dipt.* pt. 3. 627.
Inhabits also Hindostan.

Gen. Helophilus, *Meigen.*

97. Helophilus insignis, *Walk.* See page 17.

Gen. Merodon, *Fabr.*

98. Merodon varicolor, n. s., fœm. Atra, antennis nigris, aristâ testaceâ, thorace postico cinereo, scutello fulvo, abdomine basi fulvo segmentis testaceo-fasciatis, pedibus nigris, alis subcinereis apud costam fuscis venis nigris, halteribus testaceis.

Female. Deep black. Head with hoary tomentum in front. Antennæ black; arista testaceous. Thorax cinereous towards the scutellum, which is tawny. Abdomen with testaceous bands; base tawny. Legs black. Wings slightly greyish, mostly dark brown along the costa; veins black. Halteres testaceous. Length of the body 8 lines; of the wings 12 lines.

Gen. Xylota, *Meigen.*

99. Xylota conformis, *Walk.* See page 18.

Gen. Milesia, *Latr.*

100. Milesia macularis, *Wied.* See page 18.

101. Milesia Reinwardtii, *Wied.* See page 18.

102. Milesia Zamiel, n. s., fœm. Atra, abdomine nigro-cupreo fasciis duabus angustis interruptis flavis, femoribus rufis basi nigris, alis luteis posticè subcinereis maculâ magnâ costali subapicali fuscâ, halteribus fulvis.

Female. Deep black. Head shining in front. Proboscis and antennæ black. Abdomen blackish cupreous, shining, with two slender interrupted yellow bands. Legs black; femora red, black at the base. Wings luteous, greyish along the hind border, with a large brown costal subapical spot; veins luteous, brown towards the tips. Halteres tawny. Length of the body 8 lines; of the wings 16 lines.

Gen. Volucella, *Geoff.*

103. Volucella trifasciata, *Wied. Auss. Zweift.* ii. 196. 3.
Inhabits also Java.

Gen. Baryterocera, n. g.

Fœm. *Corpus* sublineare, compactum. *Caput* thorace paullò latius; facies plana. *Antennæ* conspicuæ; articuli 1us et 2us brevissimi; 3us longissimus, dilatatus, subarcuatus; arista nuda, basalis, articulo 3o non longior. *Abdomen* subovatum, arcuatum, sessile, thorace paullò brevius et latius. *Pedes* validi, breviusculi. *Alæ* breviusculæ; venæ transversæ exteriores rectæ non obliquæ.

Female. Body compact, nearly linear. Head a little broader than the thorax; face flat; epistoma slightly prominent. Proboscis extending a little beyond the epistoma. Antennæ diverging; 1st and 2nd joints very short; 3rd very long, dilated, curved and slightly widened towards the tip; arista bare, seated on the base of the 3rd joint, which it does not exceed in length. Abdomen sessile, arched, nearly oval, a little broader and shorter than the thorax. Legs stout, simple, rather short. Wings somewhat short; exterior transverse veins straight, upright, forming almost right angles with the cubital, præbrachial and externo-medial veins.

104. Baryterocera inclusa, n. s., fœm. Nigro-cuprea, capite antico albido, antennis nigris articulo 3o subtùs luteo, thorace pectoreque testaceo bivittatis, abdomine fasciis tribus testaceis, 1a basali biguttatâ, 2a interruptâ, 3a apicali latissimâ trimaculatâ, pedibus testaceis, femoribus posticis apice tibiisque posticis nigris, alis subcinereis maculâ costali fasciâque exteriore pallidiore fuscis.

Female. Blackish cupreous, shining. Head whitish in front. Antennæ black; 3rd joint luteous beneath. Thorax with a testaceous stripe on each side. Pectus with a testaceous streak on each side. Abdomen with three testaceous bands; 1st basal, entire, dilated on each side, including a blackish-cupreous dot on each side; 2nd interrupted, dilated on each side and connected with the 3rd, which is apical, very broad, and includes three very large blackish cupreous spots. Legs testaceous; hind femora towards the tips and hind tibiæ black. Wings greyish, with a dark brown spot

beyond the middle of the costa, and with a paler incomplete exterior band; veins black, testaceous at the base. Halteres testaceous. Length of the body 3 lines; of the wings 5 lines.

Gen. CITIBÆNA, n. g.

Mas. Corpus sublineare, pilosissimum. *Caput* thorace vix latius; facies plana. *Oculi* villosissimi. *Antennæ* breves; articuli 1us et 2us transversi; 3us conicus, longior et paullò latior; arista nuda, basalis, articulo 3° duplò longior. *Abdomen* thorace multò longius. *Pedes* simplices, sat graciles. *Alæ* sat angustæ; vena transversa exterior inter cubitalem et præbrachialem angulata, ramulum emittens.

Male. Allied to *Chrysochlamys*. Body nearly linear, thickly pilose. Head hardly broader than the thorax; face flat. Proboscis short. Eyes very pubescent. Antennæ short; 1st and 2nd joints transverse; 3rd conical, longer and a little broader; arista bare, seated on the base of the 3rd joint, and about twice its length. Abdomen much longer than the thorax. Legs simple, pubescent, rather slender. Wings rather narrow; 1st externo-medial vein curved; transverse vein between it and the præbrachial nearly straight and upright; transverse vein between the cubital and the præbrachial forming an angle which emits a short stump; fore side of the angle straight; hind side curved.

105. CITIBÆNA AURATA, n. s., mas. Cuprea aureo-pubescens, capite aurato, oculis villosis, antennis pedibusque testaceis, thorace bivittato, femoribus basi cupreis, posticis cupreis apice testaceis, alis sublimpidis apice subcinereis, venis halteribusque testaceis.

Male. Cupreous, thickly covered with gilded down. Head with gilded tomentum in front. Antennæ testaceous. Eyes very pubescent. Thorax with two stripes of pale tomentum. Abdomen brighter than the thorax. Legs testaceous; anterior femora cupreous at the base; hind femora cupreous, with testaceous tips. Wings nearly limpid, greyish towards the tips; veins testaceous, black towards the tips. Halteres testaceous. Length of the body 4 lines; of the wings 7 lines.

Gen. SYRPHUS, *Fabr.*

106. Syrphus ægrotus, *Fabr. Syst. Antl.* 243. 48. (Eristalis.)
Inhabits also Hindostan, Java, and China?

107. Syrphus alternans, *Macq. Dipt. Exot.* ii. 89. 7.
Inhabits also Hindostan.

108. SYRPHUS DIVERTENS, n. s., fœm. Chalybæus æneo-varius, capite antico antennis thoracis vittis duabus scutelloque testaceis, abdomine subluteo fasciis tribus strigis sex obliquis vittâque brevi interruptâ apicali nigris, pedibus halteribusque testaceis, tibiis posticis fuscis, alis limpidis.

Female. Chalybeous, partly æneous. Head in front, antennæ, a stripe on each side of the thorax and scutellum testaceous. Abdomen pale luteous, with three black bands on the hind borders of the segments; a black basal forked streak; the two following segments with an oblique black streak on each side, and an apical interrupted black streak. Legs testaceous; hind

tibiæ brown. Wings limpid, rather long; veins black. Halteres testaceous. Length of the body 4 lines; of the wings 9 lines.

109. Syrphus cyathifer, n. s., fœm. Chalybæo-niger, antennis pedibusque fulvis, abdomine maculis sex subtrigonis duabusque minoribus apicalibus fulvis, alis fusco-cinereis, halteribus fulvis.

Female. Chalybeous-black. Head about the eyes and pectus chalybeous. Antennæ tawny. Abdomen with eight tawny spots; 1st, 2nd and 3rd pair large, nearly triangular; 4th smaller, semicircular. Legs tawny. Wings brownish-grey; veins black. Halteres tawny. Length of the body 3 lines; of the wings 6 lines.

Gen. Baccha, *Fabr.*

110. Baccha Amphithoë, *Walk. Cat. Dipt.* pt. 3. 549.
Inhabits also Hindostan.

Gen. Ascia, *Meigerle.*

111. Ascia brachystoma, *Wied. Auss. Zweifl.* ii. 90. 1.
Inhabits also Hindostan.

Fam. MUSCIDÆ, *Latr.*

Subfam. Tachinides, *Walk.*

Gen. Eurygaster, *Macq.*

112. Eurygaster subferrifera, n. s., fœm. Nigra cinereo-tomentosa, capite albo, palpis fulvis, thorace vittis quatuor angustis nigris, abdomine fasciis tribus vittâque angustâ nigris, maculis duabus ventre femoribusque ferrugineis, alis subcinereis.

Female. Black, with cinereous tomentum and long black bristles. Head white in front and about the eyes; frontalia black, nearly linear; facialia without bristles; epistoma not prominent, with a stout bristle on each side. Eyes pubescent. Palpi tawny. Antennæ extending to the epistoma; 3rd joint linear, rounded at the tip, full four times the length of the 2nd; arista slender, very much longer than the 3rd joint. Thorax with four slender incomplete black stripes. Abdomen obconical, hardly longer than the thorax, with three black bands and with a slender black stripe; a large ferruginous spot on each side of the 2nd segment; underside mostly ferruginous. Legs black; femora ferruginous. Wings greyish; veins black; præbrachial vein forming a somewhat rounded but hardly obtuse angle at its flexure, from whence it is nearly straight to its tip; discal transverse vein slightly curved inward near its hind end, parted by less than its length from the border and from the flexure of the præbrachial. Alulæ greyish. Length of the body 3 lines; of the wings 6 lines.

Gen. Megistogaster, *Macq.*

Corpus angustum, cylindricum. *Facies* obliqua. *Facialia* non setosa. *Antennæ* longæ; articulus 3us linearis, 2° sextuplò longior; arista nuda, gracilis, articulo 3° paullò longior. *Pedes* longiusculi, setosi. *Alæ* angustæ.

Megistogaster, *Macq. Mém. Soc. Sci. Nat. de Lille*, 1850, 185.

Body narrow, cylindrical, slightly setose. Face slightly retracted and oblique; epistoma not prominent; facialia without bristles. Antennæ very long; 3rd joint nearly linear, six times the length of the 2nd; arista bare, slender, a little longer than the 3rd joint. Legs setose, rather long. Wings narrow; præbrachial vein forming an obtuse angle at its flexure, nearly straight from thence to its tip, joining the costal at somewhat in front of the tip of the wing; discal transverse vein undulating, parted by about half its length from the border and from the flexure of the præbrachial. Type. Tachina Diabolus, *Wied.*

113. Megistogaster Imbrasus, *Walk. Capt. Dipt.* pt. 4. 781. (Tachina.)

Inhabits also China.

The female has silvery-white tomentum in front of the head.

Subfam. Dexides, *Walk.*

Gen. Dexia, *Meigen.*

114. Dexia munda, n. s., mas. Viridis, capite cano, frontalibus atris, oculis nudis, antennis pedibusque nigris, abdomine nigro albo-tomentoso fasciis duabus latissimis interruptis apiceque testaceis, alis fuscis, halteribus testaceis.

Male. Green, shining. Head with hoary tomentum in front and beneath, and with gilded tomentum along the eyes above; frontalia deep black, widening in front; facialia without bristles; epistoma not prominent. Eyes bare. Proboscis and palpi testaceous. Antennæ black; 3rd joint elongate; arista pubescent. Pectus and sides of the thorax with whitish tomentum. Abdomen black, shining, oblanceolate, about twice the length of the thorax, armed with several very stout spines; segments with whitish reflections, and with two very broad interrupted testaceous bands; tip testaceous. Legs black. Wings brown; veins black; præbrachial vein emitting a branch at its flexure which forms an almost right angle, from whence it is indistinctly undulating to its tip, which joins the costal at somewhat in front of the tip of the wing; discal transverse vein undulating, parted by less than half its length from the border, and by more than half its length from the flexure of the præbrachial. Alulæ slightly greyish. Halteres testaceous. Length of the body 6 lines; of the wings 8 lines.

115. Dexia extendens, n. s. (gen. Thelaira, *Desv.*), fœm. Atra, capite cano-tomentoso, vertice cervino, palpis antennisque ferrugineis, thorace vittis tribus fasciâque testaceo-tomentosis, scutelli apice testaceo, abdomine fasciis duabus latis albido-tomentosis, pedibus piceis, femoribus fulvis, alis nigro-fuscis posticè cinereis, halteribus fulvis.

Female. Deep black. Head with hoary tomentum; vertex with fawn-coloured tomentum; frontalia broad; epistoma, proboscis and palpi ferruginous. Antennæ ferruginous, much shorter than the face; arista plumose. Thorax with three stripes and one hinder band of testaceous tomentum; scutellum testaceous at the tip. Pectus with whitish tomentum. Abdomen with some stout bristles, and with two broad bands of whitish tomentum,

the fore one interrupted. Legs piceous; femora tawny. Wings blackish-brown, dark cinereous along the hind border; veins black, tawny at the base; præbrachial vein emitting a short branch at its flexure which forms a slightly acute angle from whence the vein is curved to its tip, and joins the costal at somewhat in front of the tip of the wing; discal transverse vein undulating, parted by hardly half its length from the border, and by rather less than its length from the flexure of the præbrachial. Alulæ cinereous. Halteres tawny. Length of the body 5½ lines; of the wings 12 lines.

Subfam. Sarcophagides, *Walk.*

Gen. Cynomyia, *Desv.*

116. Cynomyia fortis, n. s., mas. Lætè cyaneo-viridis, capite testaceo-tomentoso, frontalibus nigris, palpis antennisque ferrugineis, abdomine cyaneo, pedibus nigris, alis fusco-cinereis, halteribus fulvis.

Male. Bright bluish-green, with black bristles. Head with shining testaceous tomentum; frontalia black, widening in front. Proboscis, palpi and antennæ pale ferruginous; 3rd joint of the antennæ very long; arista deeply plumose. Abdomen blue. Legs black, stout, very pilose. Wings brownish-grey, darker along the costa beyond the middle; veins black, ferruginous at the base. Halteres tawny. Length of the body 7 lines; of the wings 12 lines.

Gen. Sarcophaga, *Meigen.*

117. Sarcophaga aliena, *Walk.* See page 22.

118. Sarcophaga indicata, n. s., mas. Nigra, capite albo-tomentoso, frontalibus atris, thoracis vittis quatuor interlineatis pectoreque canis, abdomine apicem versus subferrugineo e maculis excavatis albidis quadrifariam tessellato, alis subcinereis, halteribus fulvis.

Male. Black. Head with shining white tomentum; frontalia deep black, linear, rather broad. Antennæ black. Thorax with four hoary stripes, which are interlined with black. Pectus hoary. Abdomen with a ferruginous tinge, which is most apparent towards the tip, distinctly tessellated with four rows of excavated whitish spots. Wings greyish; veins black; præbrachial forming an acute angle at its flexure, near which it is very much curved inward, and is thence straight to its tip; discal transverse vein slightly undulating, parted by less than its length from the border, and by much less than its length from the flexure of the præbrachial. Alulæ grey. Halteres tawny. Length of the body 4½ lines; of the wings 8 lines.

Subfam. Muscides, *Walk.*

Gen. Idia, *Meigen.*

119. Idia discolor, *Fabr. Syst. Antl.* 295. 55. (Musca.)
Inhabits also Java.

120. IDIA BIVITTATA, n. s., fœm. Rufa subtùs testacea, capite antico nigro, thorace vittis duabus nigris, abdomine suprà nigro vittâ brevi anticâ rufâ, pedibus testaceis, tarsis anticis nigris basi albidis, alis fusco-cinereis.

Var. β. Thorace nigro vittis duabus canis, abdominis dorso toto nigro.

Female. Red, testaceous beneath. Head black in front. Antennæ pale red. Thorax with two black stripes. Abdomen above black, with a short red stripe on the anterior part. Legs testaceous; fore tarsi black, whitish towards the base. Wings brownish-grey, darker along the costa towards the base; veins black. Halteres testaceous.

Var. β. Thorax black, with two hoary stripes. Abdomen wholly black above. Length of the body 3 lines; of the wings 5 lines.

Gen. MUSCA, *Linn.*

121. Musca flaviceps, *Macq.* See page 23.

122. Musca chalybea, *Wied. Auss. Zweifl.* ii. 402. 30.
Inhabits also Java.

123. Musca micans?, *Fabr. Syst. Antl.* 291. 38 (genus Silbomyia, *Macq.*).
Inhabits also Hindostan, Sumatra and Java.
This is certainly the *S. micans* of Macquart, but does not quite agree with the descriptions of Fabricius and of Wiedemann.

124. Musca trita, *Walk.* See page 24.

125. Musca diffidens, *Walk.* See page 26.

126. MUSCA EXEMPTA, n. s. (n. subgen. allied to Pyrellia, *Desv.*), fœm. Lætè viridis, palpis antennisque nigris, abdominis disco purpureo, pedibus piceis, alis subcinereis basi fuscis, venis præbrachiali et cubitali conjunctis.

Female. Bright green. Palpi and antennæ black. Disk of the abdomen purple. Legs piceous; femora darker than the tibiæ. Wings slightly greyish, brown at the base and along nearly half the length of the costa; veins black; præbrachial vein curved, not angular, joining the cubital vein near the tip of the latter; discal transverse vein almost straight, parted by less than its length from the border, and by more than its length from the flexure of the præbrachial. Alulæ lurid. Length of the body 2 lines; of the wings 3½ lines.

127. Musca domestica, *Linn. Syst. Nat.* ii. 990.
Inhabits also Europe and some parts of Africa, Asia, and America.

Gen. BENGALIA, *Dev.*

128. Bengalia Dioclea, *Walk. Cat. Dipt.* pt. 4. 869 (Musca).

Subfam. ANTHOMYIDES, *Walk.*

Gen. ARICIA, *Macq.*

129. Aricia patula, *Walk.* See page 28.
This may perhaps be a variety of Anthomyia quadrata, *Wied. Auss. Zweifl.* ii. 428. 14.
The latter inhabits Java.

130. Aricia inaperta, n. s., mas et fœm. Testacea, capite suprà et thoracis disco nigris, orbitis albis, pedibus testaceis, alis cinereis apud costam obscurioribus venis nigris basi fulvis. *Fœm.* Abdominis disco nigro.

Male and Female. Testaceous. Head above and disk of the thorax black. Abdomen shining. Eyes bordered with white tomentum. Legs testaceous. Wings grey, darker along the costa; veins black, tawny at the base; discal transverse vein undulating, slightly oblique, parted by less than its length from the border, and by much more than its length from the præbrachial transverse vein. *Female.* Disk of the abdomen black. Length of the body 3 lines; of the wings 5½ lines.

Gen. Anthomyia, *Meigen.*

131. Anthomyia illocata, n. s., fœm. Albida, capite albo, maculâ verticis subquadratâ nigrâ; thorace fasciâ nigrâ, abdomine e maculis nigris trivittato, alis sublimpidis.

Closely allied to *A. tonitrui*, Wied. *Female.* Whitish, with black bristles. Head white. Frontalia with a black subquadrate spot in front. Proboscis and legs black. Thorax with a black band in front of the wings. Abdomen with three rows of black spots; the middle spots lanceolate, the lateral triangular. Wings nearly limpid; veins black, testaceous at the base; discal transverse vein slightly curved and oblique, parted by much less than its length from the border, and by much more than its length from the præbrachial transverse vein. Length of the body 2½ lines; of the wings 4 lines.

Gen. Cænosia, *Meigen.*

132. Cœnosia macularis, *Wied. Auss. Zweifl.* ii. 438. 2.

Inhabits also Hindostan.

133. Cænosia insurgens, n. s., fœm. Nigra cinereo-tomentosa, orbitis albis, antennis testaceis, abdomine e maculis nigris trivittato, alis limpidis, halteribus pallidis.

Female. Black, with cinereous tomentum. Head white about the eyes. Antennæ dull testaceous. Abdomen with three black spots on each side. Wings limpid; veins black, testaceous at the base; discal transverse vein parted by full its length from the border and by nearly twice its length from the præbrachial transverse vein. Halteres pale. Length of the body 2 lines; of the wings 4 lines.

Subfam. Helomyzides, *Fallen.*

Gen. Helomyza, *Fallen.*

134. Helomyza orientalis, *Wied. Auss. Zweifl.* ii. 575. 2. (Sciomyza.)

Inhabits also Java.

135. Helomyza fuscicostata, n. s., fœm. Fulva, facie orbitisque canotomentosis, abdomine nigro basi fulvo, tibiis tarsisque fuscescentibus, alis cinereis apud costam fuscis.

Female. Tawny with black bristles, paler beneath. Head with hoary tomentum about the eyes and in front. Abdomen black, tawny at the base. Tibiæ and tarsi brownish. Wings grey, brown along the costa; veins black,

tawny at the base; discal transverse vein oblique, hardly undulating, parted by full half its length from the border and by less than twice its length from the præbrachial transverse vein. Halteres testaceous, with darker knobs. Length of the body 3½ lines; of the wings 7 lines.

136. HELOMYZA ÆQUATA, n. s., fœm. Ferruginea, facie cinereo-tomentosâ, antennis fulvis, scutelli apice pectoreque nigricantibus, abdomine nigro, pedibus piceis, alis luridis posticè cinereis.

Female. Ferruginous, with black bristles. Head with cinereous tomentum in front. Antennæ tawny. Scutellum towards the tip and pectus blackish. Abdomen black. Legs piceous. Wings lurid, grey along the hind border; veins tawny; discal transverse vein straight, oblique, parted by less than its length from the border, and by much more than twice its length from the præbrachial transverse vein. Halteres testaceous. Length of the body 2½ lines; of the wings 5 lines.

137. HELOMYZA LIMBATA, n. s., fœm. Pallidè fulva, thorace abdomineque latè nigro-vittatis, pedibus testaceis, alis cinereis.

Female. Pale tawny, with black bristles, testaceous beneath. Arista black, deeply plumose. Thorax and abdomen with a broad black stripe. Legs testaceous. Wings grey; veins black, tawny at the base; discal transverse vein parted by much less than its length from the border, and by more than twice its length from the præbrachial transverse vein. Length of the body 2 lines; of the wings 4 lines.

138. HELOMYZA PROVECTA, n. s., fœm. Fulva, orbitis albidis, pedibus testaceis, tarsis obscurioribus, alis luridis posticè cinereis apice fuscis.

Female. Tawny, testaceous beneath. Head whitish about the eyes. Arista black, with long hairs. Legs testaceous; tarsi darker. Wings lurid, grey along the hind border, brown at the tips and along the adjoining part of the costa; veins tawny, black in the brown part and along the costa; discal transverse vein clouded with brown, parted by half its length from the border, and by twice its length from the præbrachial transverse vein. Length of the body 2½ lines; of the wings 5 lines.

139. HELOMYZA INVICTA, n. s., fœm. Fulva, abdominis segmentis nigro-fasciatis, pedibus testaceis, alis cinereis dimidio apicali anticè fusco venâ discali transversâ fusco-nebulosâ.

Female. Tawny, testaceous beneath. Arista black, with long hairs. Abdomen with a blackish band on the hind border of each segment. Legs testaceous. Wings grey, brown on half the breadth behind the apical half of the costa; discal transverse vein clouded with brown, almost straight and upright, parted by its length from the border, and by more than twice its length from the præbrachial transverse vein.. Length of the body 2 lines; of the wings 4 lines.

Gen. SAPROMYZA, *Fallen.*

140. Sapromyza biguttata, *Macq. Dipt. Exot.*
Inhabits also Java.

Gen. GAUZANIA, n. g.

Fœm. *Corpus* gracile, setosum, subcylindricum. *Oculi* nudi. *Antennæ*

breves; articulus 3us longè conicus; arista plumosa. *Abdomen* oblanceolatum, thorace angustius, vix longius. *Pedes* non setosi. *Alæ* angustæ, venis parallelis.

Female. Body slender, bristly, nearly cylindrical. Eyes bare. Antennæ short; 3rd joint elongate-conical; arista deeply plumose. Abdomen oblanceolate, shining, narrower but very little longer than the thorax. Legs not bristly. Wings narrow; præbrachial vein parallel to the cubital; discal transverse vein straight, parted by about its length from the border, and by much more than twice its length from the præbrachial transverse vein.

141. Gauzania devecta, n. s., fœm. Nigra obscura, abdomine nitente, pedibus piceis, alis nigricantibus posticè pallidioribus, halteribus albidis.

Female. Black, dull. Abdomen shining. Legs piceous; femora darker than the tibiæ. Wings blackish, paler along the exterior border; veins black. Halteres whitish. Length of the body 1¾ line; of the wings 3½ lines.

Subfam. Lauxanides, *Walk.*

Gen. Lauxania, *Latr.*

142. Lauxania eucera, *Walk.* See page 29.

Gen. Celyphus, *Dalman.*

143. Celyphus scutatus, *Wied. Auss. Zweifl.* ii. 601. 2.
Inhabits also Hindostan and the Philippine Islands.

Subfam. Ortalides, *Haliday.*

Gen. Lamprogaster, *Macq.*

144. Lamprogaster zonata, *Walk.* See page 30.

145. Lamprogaster glabra, *Walk.* See page 30.
"On decaying timber," *Wallace MSS.*

146. Lamprogaster basilutea, n. s., mas. Nigra, capite apud oculos vittisque duabus anticis testaceis, antennis piceis, thorace vittis quatuor pallidè flavis, abdomine fasciis duabus pallidè flavis posticâ interruptâ, femoribus apice rufescentibus, tarsis albis apice nigris, alis cinereis fusco subnebulosis basi anticè luteis, halteribus testaceis.

Male. Very nearly allied to *L. zonata*, and perhaps the male of that species. Black, shining. Head testaceous about the eyes, and with two testaceous stripes in front. Antennæ piceous. Thorax with four pale yellow stripes, one on each side in front of the wings, and one on each side of the scutum. Abdomen with two slender pale yellow bands, the hind one interrupted. Femora reddish at the tips; tarsi white, with black tips. Wings grey, partly and very slightly clouded with brown, luteous along the basal part of the costa; veins black, tawny towards the base and along the costa; discal transverse vein like that of *L. zonata*. Halteres testaceous. Length of the body 3 lines; of the wings 6 lines.

147. Lamprogaster divisa, n. s., fœm. Nigra, tibiis testaceis nigro-fasciatis, tarsis albis apice nigris, alis nigricantibus guttis plurimis fasciâque interlineatâ limpidis, halteribus pallidis.

Female. Black. Abdomen shining. Tibiæ testaceous, with black bands; tarsi white, with black tips. Wings blackish, with numerous limpid dots, and with a limpid band which includes the discal transverse vein, and is intersected by an interrupted blackish line. Halteres pale. Length of the body 2 lines; of the wings 4 lines.

148. LAMPROGASTER PUNCTATA, n. s., mas. Nigra, capite antico testaceo, orbitis albidis, antennis halteribusque testaceis, pectore vittis duabus testaceis, pedibus piceis, alis nigro-fuscis guttis decem discalibus luridis guttâque apicali albâ.

Male. Black, slightly shining. Head very shining in front, testaceous about the mouth, whitish about the eyes. Antennæ testaceous. Pectus with a testaceous stripe on each side. Legs piceous. Wings blackish-brown, with about ten lurid dots on each, and with a larger white dot on each tip. Halteres testaceous. Length of the body 1¾ line; of the wings 3 lines.

149. LAMPROGASTER GUTTATA, n. s., mas. Nigra, orbitis albidis, epistomate antennis halteribusque testaceis, pectore vittis duabus vix determinatis testaceis, pedibus piceis, alis nigro-fuscis guttis plurimis apicibusque limpidis.

Male. Black, slightly shining. Head very shining in front, testaceous about the epistoma, whitish about the eyes. Antennæ testaceous. Pectus with an indistinct testaceous stripe on each side. Legs piceous. Wings blackish-brown, with many limpid dots, the largest on the hind border; tips limpid. Halteres testaceous. Length of the body 1½ line; of the wings 2½ lines.

The two preceding species may perhaps form a new genus, the peculiar characters of *Lampromyia* being hardly conspicuous in them.

Gen. SOPHIRA, *Walk.*

150. SOPHIRA CONCINNA, n. s., fœm. Testacea, frontalibus luteis, thorace fasciis duabus lateralibus vittisque duabus nigricantibus, pectore ex parte abdominisque vittis quatuor nigris, tibiis posticis fuscescentibus, alis obscurè fuscis apices versus pallidè fuscis strigis basalibus fasciâque abbreviatâ limpidis.

Female. Testaceous, shining. Head with luteous frontalia. Thorax with two blackish stripes, and on each side with two blackish bands. Pectus partly black. Abdomen with four black stripes. Hind tibiæ brownish. Wings dark brown, pale brown on the apical third part, with limpid basal streaks, and with a limpid slightly abbreviated band beyond the middle; veins black. Length of the body 3 lines; of the wings 6 lines.

Gen. RIOXA, *Walk.*

151. Rioxa lanceolata, *Walk.* See page 35. This species is very variable in the breadth of the stripes of the thorax, and in the number and size of the spots on the wings.

152. RIOXA CONFINIS, n. s., fœm. Ferruginea, abdomine nigricante, alis nigro-fuscis basi guttisque octo limpidis.

Female. Ferruginous. Abdomen blackish. Wings blackish-brown, limpid towards the base, with three triangular limpid spots on the costa, with two limpid spots (one of them double) on the hind border, and with two on the disk; veins black. Length of the body 3 lines; of the wings 6 lines.

Gen. Dacus.

153. Dacus æneus, *Wied. Auss. Zweifl.* ii. 513. 2.
Inhabits also Java.

154. Dacus determinatus, n. s., mas. Nigro-æneus, capite antennis pedibusque fulvis, thorace vittis tribus albidis duabusque fulvis, abdomine ferrugineo basi nigro, tibiis anticis tarsisque fuscis, alis sublimpidis apice fasciisque duabus fuscis.

Male. Æneous-black. Head and antennæ tawny. Thorax with three whitish stripes and with two tawny stripes; the latter are united at the tip of the scutellum, and the whitish bands extend obliquely on each side to the pectus. Abdomen ferruginous, black above at the base. Legs tawny; tips of the femora darker; posterior femora minutely spinose beneath; tarsi and fore tibiæ brown. Wings nearly limpid, brown from the discal transverse vein to the tips, and with two brown bands; 1st band very imperfect; 2nd very pale and diffuse on the hind half of the wing. Halteres whitish. Length of the body 4½ lines; of the wings 7 lines.

155. Dacus figuratus, n. s., fœm. Niger, capite antennis pedibusque fulvis, vertice nigro, thorace vittis tribus (intermediâ quadriramosâ) pectoreque testaceis, abdomine vittâ anticâ fasciâque lutcis, tibiis tarsisque posterioribus fuscis, alis subcinereis apice fuscis plagâ mediâ costali luridâ, halteribus albidis.

Female. Black, shining. Head and antennæ pale tawny; vertex black. Thorax with three testaceous stripes, the middle one emitting two oblique branches on each side. Pectus with two testaceous stripes. Abdomen with a luteous stripe extending from the base to the middle, where it is united to a luteous band. Legs tawny; posterior tibiæ and tarsi brown. Wings slightly greyish, with a large lurid space along the middle of the costa; tips brown; veins black. Halteres whitish. Length of the body 3½ lines; of the wings 6 lines.

Gen. Noeeta, *Desv.*

156. Noeeta latiuscula, n. s., mas. Nigra, capite testaceo, thorace cinereo, scutello nitido, tibiis tarsisque albidis, illis fusco-fasciatis, alis nigro-fuscis guttis plurimis limpidis apud costam dilatatis limpidis fusco-fasciatis.

Male. Black. Head testaceous, with white tomentum in front and beneath. Antennæ and halteres testaceous. Thorax with grey tomentum. Scutellum brilliant black. Abdomen shining. Tibiæ and tarsi whitish, the former with brown bands. Wings blackish-brown, with many limpid dots; costal part limpid, somewhat dilated, with transverse brown streaks. Length of the body 1¼ line; of the wings 3 lines.

Gen. Trypeta, *Meig.*

157. Trypeta rudis, n. s., fœm. Nigra cinereo-tomentosa, capite thoracis scapulis fasciâ interruptâ scutello abdominis apice pedibusque testaceis, alis sublimpidis fasciis duabus fuscis 1ª posticè abbreviatâ.

Female. Black, with cinereous tomentum. Head testaceous in front and beneath. Antennæ, legs and halteres testaceous. Scapulæ of the thorax,

an interrupted band, scutellum, and tip of the abdomen also testaceous. Wings nearly limpid, with two brown bands, the interior one abbreviated hindward; veins black, testaceous at the base. Length of the body 3 lines; of the wings 5 lines.

Gen. UROPHORA, *Desv.*

158. UROPHORA FASCIATA, n. s., fœm. Nigra nitens, capite antennis scapulis scutello abdominis terebrâ pedibusque testaceis, abdomine fasciis duabus albido-tomentosis, femoribus posterioribus piceis, alis nigro-fuscis vittâ latâ subobliquâ limpidâ apicem versus furcatâ et arcuatâ.

Female. Black, shining. Head testaceous, whitish in front and beneath. Antennæ, scapulæ, scutellum, legs and halteres testaceous. Abdomen with two bands of whitish tomentum. Terebra testaceous, long, slender. Posterior femora mostly piceous. Wings blackish-brown, with some paler spots along the costa, and with a broad, slightly oblique limpid stripe, which towards its tip is divided and curved to the hind border. Length of the body 4 lines; of the wings 6 lines.

Subfam. ACHIIDES, *Walk.*

Gen. ACHIAS, *Fabr.*

159. Achias maculipennis, *Westw.* See page 36.

There are two specimens of the male of this species, and the petiole with which the head is furnished on each side is much longer in one specimen than in the other, and in the latter is much longer than in the male from Singapore. I am indebted to Mr. Westwood for the correction of an error in page 33, where the female of this species is described by the name of *Themara ampla.*

Subfam. DIOPSIDES, *Walk.*

Gen. DIOPSIS, *Linn.*

160. Diopsis quinqueguttata, *Walk.* See page 36.

161. Diopsis quadriguttata, *Walk.* See page 37.

162. DIOPSIS DISCREPANS, n. s., mas et fœm. Nigra nitens, antennis fulvis, abdomine apud petioli apicem maculis duabus rufis tomento albo plagiatis, pedibus rufescentibus, tarsis testaceis, alis sublimpidis maculâ apud venam transversam præbrachialem fasciâque exteriore fuscis. *Mas.* Oculorum petiolis corpore paullò longioribus aut brevioribus. *Fœm.* Oculorum petiolis corporis dimidio brevioribus.

Male and Female. Black, shining. Antennæ tawny. Abdomen at the tip of the petiole with two red spots, each accompanied by a patch of white tomentum. Legs reddish; tarsi testaceous. Wings nearly limpid, with a brown spot on the præbrachial transverse vein, and with an exterior brown band; veins black. Halteres white.

Male. Petioles of the eyes a little longer or a little shorter than the body.

Female. Petioles of the eyes less than half the length of the body. Length of the body 2½ lines; of the wings 4 lines.

Subfam. Sepsides, *Walk.*

Gen. Calobata, *Fabr.*

163. Calobata strenua, n. s., fœm. Nigra sat valida, capite antico nigro-cyaneo, thorace subcinereo, femoribus mediis flavo unifasciatis posticis flavo bifasciatis, tarsis anticis albis, alis subcinereis fasciâ latâ fuscâ apice subfuscescentibus, halteribus piceis.

Female. Black, rather stout. Head shining, blackish-blue in front, with white tomentum about the eyes. Thorax slightly tinged with grey tomentum. Legs long, slender; middle femora with one yellow band; hind femora with two yellow bands, one of them at the base; fore tarsi white. Wings slightly greyish, with a broad brown band beyond the middle; tips slightly brownish; veins black. Halteres piceous. Length of the body 6 lines; of the wings 8 lines.

164. Calobata cedens, n. s., fœm. Nigro-cyanea nitens, antennis abdomine pedibusque nigris, pectore plagis duabus albo-tomentosis, femoribus anticis basi testaceis posterioribus testaceis nigro-fasciatis, tarsis anticis albis, alis subcinereis fasciâ fuscâ apice subfuscescentibus.

Female. Blackish-blue, shining. Antennæ, abdomen and legs black. Pectus with a patch of white tomentum on each side. Legs long and slender; fore femora testaceous towards the base; posterior femora testaceous, with blackish bands; fore tarsi white. Wings slightly greyish, with a brown band beyond the middle; tips slightly brownish. Halteres testaceous, with blackish knobs. Length of the body 3¼–4 lines; of the wings 6–7 lines.

Gen. Cardiacephala, *Macq.*

165. Cardiacephala longicollis, n. s., mas. Rufo-lutea, capitis maculis duabus facieque nigris, thorace longissimo lanceolato lineis duabus glaucis, abdomine apicem versus nigro, tibiis tarsisque nigricantibus, tarsis anticis basi albis, alis subcinereis apice fuscescentibus, apud costam subluteis.

Male. Reddish luteous. Head with a black spot on each side of the vertex; face black, with white tomentum on each side. Thorax very long, attenuated in front, with a glaucous stripe on each side. Abdomen black towards the tip, not longer than the thorax. Legs long and slender; tibiæ and tarsi blackish; fore tarsi white at the base. Wings slightly greyish, brownish at the tips, and with a luteous tinge along the costa; veins black, tawny towards the base. Length of the body 5 lines; of the wings 7 lines.

Subfam. Psilides, *Walk.*

Gen. Micropeza, *Meigen.*

166. Micropeza fragilis, *Walk.* See page 37.

Gen. Nerius, *Wied.*

167. Nerius fuscipennis, *Macq.* See page 38.

Gen. Texara, *Walk.*

168. Texara compressa, *Walk.* See page 38.

Subfam. Geomyzides, *Fallen*.

Gen. Gymnopa, *Fallen*.

169. Gymnopa? gutticosta, n. s., fœm. Nigra nitens, pectoris lateribus canis, thoracis fasciâ abdominisque basi pallidè flavis, tibiis tarsisque ferrugineis, alis subflavescentibus guttâ costali nigrâ.

Female. Black, shining. Head wanting. Thorax with a pale yellow band. Pectus hoary on each side. Abdomen blackish, cupreous towards the base, which is pale yellow. Tibiæ and tarsi ferruginous. Wings slightly yellowish, with a black dot on the costa before half the length; veins yellowish. Length of the body 1¼ line; of the wings 3 lines.

170. Gymnopa infusa?, n. s., mas. Nigra, thorace subpubescente, scutello longi-obconico, abdomine æneo-nigro, pedibus halteribusque testaceis, alis limpidis venis nigris.

Male. Black. Head wanting. Thorax slightly pubescent. Scutellum long-obconic. Abdomen æneous-black, shining. Legs and halteres testaceous. Wings limpid; veins black; discal transverse vein parted by more than its length from the border, and by less than twice its length from the præbrachial transverse vein. Length of the body 1¼ line; of the wings 2½ lines.

On a New Organ in Insects. By John Braxton Hicks, Esq., M.D. Lond., F.L.S. &c.

[Read June 17, 1856.]

About a month since my attention was directed towards a peculiar structure in the *halteres* of the *Rhingia rostrata*, by Mr. Purkiss, who is an energetic and zealous searcher for microscopical objects, and who, from the position and structure of this organ, considered it to be the organ of smell. How far this is probable, I will leave the Society to judge at the termination of this paper. I instantly directed my attention to the subject, and I will endeavour to lay before the Society the results at which I have arrived up to the present time, apologizing for the incompleteness of the investigation, in consequence of my anxiety to bring it before the Society previous to the summer recess.

If we dissect a perfect fly, there will be seen in the centre of the thorax the great thoracic ganglion, which is formed by the fusion of the three thoracic ganglia into one. From thence it will be plainly seen that the first branch passes to the anterior leg; the second (much larger) enters the base of the wing after giving off a few branches to the muscles; the third branch passes

to the middle leg; and the fourth (the largest of all) passes straight into the *halteres*; the fifth set supplying the posterior legs. I have drawn the nerves of the Drone (Plate V. fig. 1) and Blow-fly (fig. 2).

In the *Lepidoptera* there are two thoracic ganglia. The first (the smaller) supplies the anterior legs. The second gives off the first pair to the anterior wings, the second pair to the middle legs, the third pair to the second wings, and the fourth to the posterior legs.

In the *Lucanus Cervus* (*Coleoptera*) we find three thoracic ganglia: the anterior supplies the first pair of legs; the second gives a pair to the elytra and a pair to the middle legs; while the third ganglion supplies a pair to the second wings and the posterior legs.

In the *Orthoptera*, in the Locust for example, the arrangement is similar as to the origin of the nerves.

In the *Hymenoptera* the arrangement is as in the *Lepidoptera*.

In the *Neuroptera* (Dragon-fly) there are three thoracic ganglia, the nerves passing off in the same manner as in the *Lucanus Cervus*.

In the *Hemiptera* the thoracic ganglia are fused into one, as in the Fly. But the nerve to the anterior wing is twice the size of that to the posterior.

From the above statement, it will be seen that we find in all insects—

1st, A pair of nerves going to and entering the base of each of the wings; and in the *Diptera*, of the *halteres* also.

2nd, The nerves supplying the posterior wings or *halteres* are generally the larger.

As there are no muscles in either the wings or *halteres*, these nerves must be sensatory.

I shall now describe the curious organs to which they proceed.

And first as regards the *halteres*. Situated on the pleura, and closely adjoining a large spiracle, we find the joint very free, so that these organs can be moved with such rapidity as to render them invisible when in motion; and they are beautifully protected in the Fly by the scales, which in *Rhingia rostrata* form a very beautiful object.

The *halteres* consist of a base, shaft, and head; the relative proportion of each varying in different insects. On each side of the base is a ridge, and on these ridges are situated two similar structures. In the *Rhingia rostrata* (Plate V. fig. 3), for instance,

there are about twenty rows of vesicles, each row separated from the adjoining one by a slight distance. There is a row of hairs between each row of vesicles, the hairs arching over them, and thereby forming a protection from extraneous particles. These hairs are in pairs, one pair being opposite to each vesicle. The rows on the ridge are arranged transversely to the axis of the *halteres* (fig. 3 *a*, *c*). The vesicles themselves are very transparent, and hemispherical or even more nearly spherical projections, apparently cuticular. This is well seen by a profile view, fig. 3 *e*. Their diameter, in this fly, is about $\frac{1}{1000}$th of an inch: each vesicle nearly touches its neighbour.

Beneath these, but on one side only, is a broader, flatter face, on which the vesicles are more distinct, and at a farther distance from each other, the rows arranged parallel to the axis of the *halteres*, and only one hair opposite each vesicle, there being some alternate. The diameter of each of these is about $\frac{1}{3700}$th of an inch. There is a smaller group of vesicles situated on one side of this latter face, in number about ten; the individual vesicles are rather larger.

In the *Tabanidæ* the arrangement is very similar, with the addition of seven vesicles on the shaft of the *halteres*, to the upper part of the facet of the ridge, and another group of eight or nine beneath the ridge opposite the broader facet.

In *Tipula* the same general arrangement holds, except that in the facets on the ridge the vesicles are arranged in a quincuncial manner, and are larger than those on the broad facet, being about $\frac{1}{1000}$th of an inch, with numerous hairs between each (fig. 4 *a*). The broader facet too is less extensive relatively to the others, and is also quincuncial in arrangement, of the diameter of $\frac{1}{3000}$th of an inch (fig. 4 *b*). Besides these, in the largest Crane-fly, on the joint, there is a cone, having on its flattened apex a group of about eight or nine vesicles, with numerous very small hairs between them (fig. 4 *c*).

The shaft of the *halteres* is tubular, and through it apparently passes a branch of the nerve, which seems to expand as it reaches the head, and which head contains cellular substance, and has externally a groove on one side, just below its greatest diameter. The membrane lining the groove is apparently very delicate. A group of hairs is generally found at the end of the groove.

I have now described the principal features of these curious structures, as found in the *halteres* of the *Diptera*; none that I have examined have been free from them. The number of vesicles

in each of the *halteres* (in *Rhingia* for instance) is about 120 for each principal face, making for the three faces 360.

Thus we find a nerve, the largest nerve except the optic, entering the *halteres*, where there are no muscles, therefore this nerve must be one of sensation; and I think it will be allowed that it must be one of *special* sensation.

But as there is also a nerve going to the base of the wings, we might expect to find similar structures there, and we shall not be disappointed; for if we look on the subcostal nervure at the base, we shall see a group of vesicles of a similar character to those on the *halteres*,—not so beautifully arranged, but still very distinct, as is clearly shown in the *Tabanidæ* and some *Muscæ* (fig. 5). They extend in a single row some little distance up the nervure, and are found on both sides of the nervure, but principally on the *upper* side.

These organs are not confined to the *Diptera*, but I believe are to be found in all insects; at least I have found them as far as I have examined. They exist on both sides, but principally on the upper side of the base of the subcostal nervure; on the costal nerve in *Hemiptera*. Those on the second wing are generally the largest in number and size; but that, I suspect, is determined by the size of the nerve proceeding to them. In Moths they are very apparent, being greatest in the *Noctuæ* and *Bombycidæ*. There are about 100 vesicles on the upper surface of the posterior wing, and half that number beneath, besides some few on the nervures. (See fig. 7 *b*.) In the Butterfly they are smaller, but arranged in more definite groups, about three in number. In *Coleoptera* and *Neuroptera* they are arranged in long rows along the subcostal nerve; they are more apparent in *Coleoptera* than in *Neuroptera*. In the *Hymenoptera*, for instance the Bee, they are found in a rounded group of about forty on each side (fig. 6 *a*).

In a subsequent paper I hope to show a more extended analysis of this structure in the different tribes of Insects.

Now, what is the nature of these organs? Are they organs of smell, as suggested by Mr. Purkiss? As the olfactory organ has never yet been decided on, it seems to me not improbable that they may be the organs of that sense; for, first, it is not likely that they should be the organ of hearing, as they are in constant motion, and situated near the source of the hum of the wings, so that other sounds would be drowned. 2ndly. It is not necessary that the power of smell should be in the head. It is situated in

the commencement of the air-passages in the upper animals, probably because the current of air or water passing the olfactory nerves is there most powerful; but in the spiracle-breathing insect the greatest currents are in the neighbourhood of the wing, and near the greatest thoracic spiracle. The motion of the *halteres* also permits a greater exposure to odours floating in the air.

That the olfactory nerves should be necessarily, and by analogy, always before the optic, will not hold good below Fishes, where they first appear in that position. Otherwise the auditory apparatus in *Crustacea* ought to be behind the optic. In fact, there is no known analogy on this point, as no olfactory organs have yet been described below *Vertebrata*. Besides, if there are no nerves in front of the optic except those to the mouth and antennæ, either these latter must be olfactory organs, or the olfactory organs must be sought for elsewhere behind.

It may be added, that the respiratory apparatus is diffused (as are the nervous centres), and not connected with the oral or nasal aperture; and although the sensations be the same, analogy forms no sort of argument that the organs of sensation should always occupy precisely the same place.

Description of Plate V.

Fig. 1. Nervous system of the Drone-fly (*Eristalis tenax*): *a*, nerve of first leg; *b*, nerve of second leg; *c*, nerve of third leg; *d*, nerve of wing; *e*, nerve of one of the halteres.

Fig. 2. Nervous system of Blow-fly (*Musca vomitoria*); nerves lettered as above.

Fig. 3. Details of *Rhingia rostrata*; 3 *a*, base of one of the halteres: *a*, group of vesicles on ridge; *b*, ditto on the broad facet; *b'*, a group of larger vesicles on the side of *b*. 3 *b*, base of one of the halteres, another view, showing, *a'*, group of vesicles on the other ridge; 3 *c*, magnified vesicles of the ridge, diameter 4000th of an inch; 3 *d*, ditto on broad facet, diameter 3700th of an inch; 3 *e*, profile of 3 *c*.

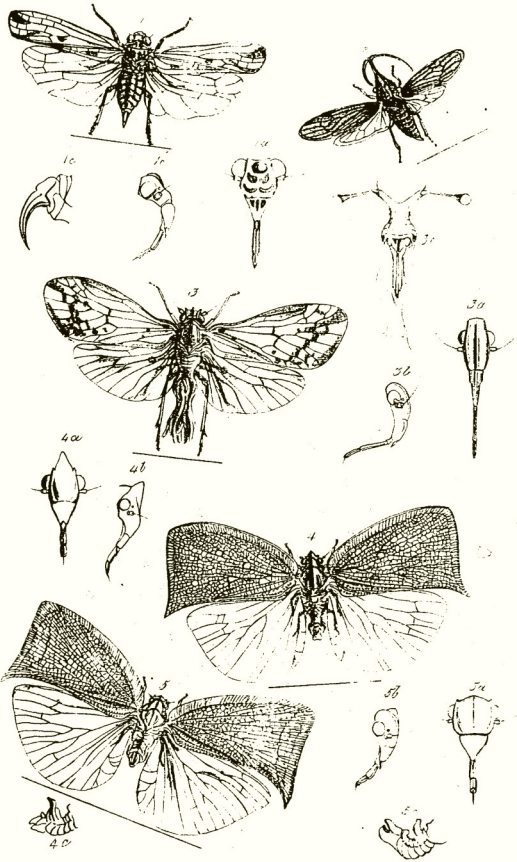
Fig. 4. Details of the largest Crane-fly (*Tipula oleracea?*): 4 *a*, base of one of the halteres; 4 *b*, ditto, another view; 4 *c*, several of the vesicles on the ridge, diameter 1900th of an inch; 4 *d*, ditto on broad face, diameter 3000th of an inch; 4 *e*, ditto on the conical lobe at the junction of the halteres with the body.

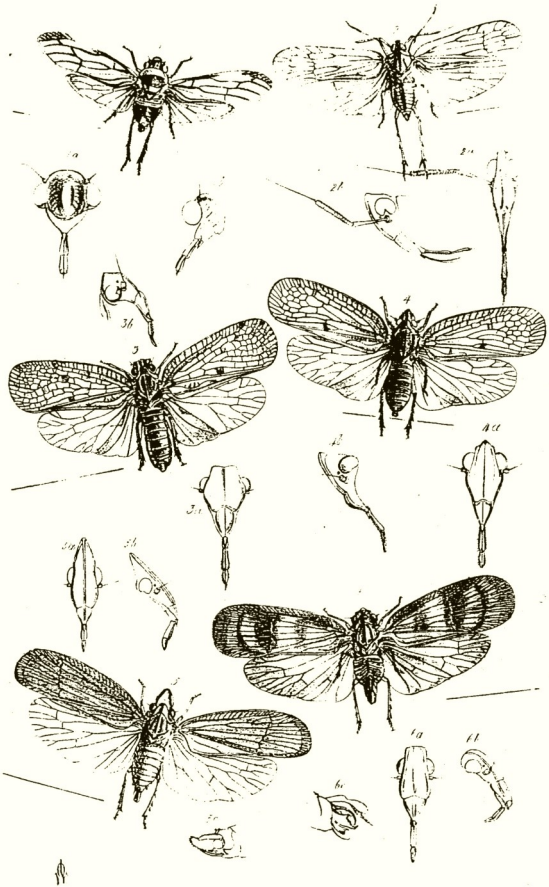
Fig. 5. Details of Blow-fly (*Musca vomitoria*): 5 *a*, base of one of the halteres; 5 *b*, another view of ditto; 5 *c*, vesicles on the ridge, diameter 2720th of an inch; 5 *d*, ditto on the broad facet with the small lateral group, diameter 3730th of an inch.

Fig. 6. Details of Bee (*Andrena Mouffetella*): 6 *a*, dorsal view of the vesicles on the costa of the hind wing; 6 *b*, section of ditto.

Fig. 7 *a*, Subcostal nervure of the *Ermine Moth*, upper side; 7 *b*, section of ditto.

Fig. 8 *a*, Base of anterior wing of *Leptis scolopacea*, showing the base of the subcostal nervure on the upper side; 8 *b*, ditto on the under side.





β. *glaberrimum*, foliis paullo majoribus.—In ins. Angau et Ovalau (ins. Fecjee) (*Milne*), et ins. Sandwich teste herb. Hooker., sed hic fortè latet error quidam.

8. *G. rupestre*, Forst., DC. Prod. vol. ix. p. 26.—*G. hæmospermum*, Steud., DC. l. c. p. 27.—Blume, Mus. Bot. vol. i. p. 238.—In ins. Java (*Lobb*, &c.), Fecjee (*Amer. Explor. Exped.*), Tanna e Novis Hebridibus (*G. Forster*).

9. *G. reticulatum*, Blume, l. c. p. 239.—Java.—A me non visum.

10. *G. montanum*, Zoll. et Mor. Verz. Pl. Jav. p. 58.—Mihi ignotum. An *G. rupestris* var. ?—Java.

11. *G. ligustrifolium*, A. Cunn.; Hook. Ic. t. 430; DC. Prod. vol. ix. p. 27.—In Nova Zeelandia.

12. *G. micranthum*, DC. l. c.—Mihi ignotum.—In ins. Marianis.

13. G. CUMINGIANUM, foliis elliptico-lanceolatis acuminatis basi acutis, cymis brevibus, calycis lobis ovatis obtusis, corollæ lobis basi intus villosis.—Folia et inflorescentia *G. ligustrifolii* sed ab omnibus diversum calycis lobis apice minimè acuminatis. Cymulæ plurifloræ in speciminibus Cumingianis, 1–3-floræ in Lobbianis. Corollæ laciniæ intus basi tantum pilosæ, nec ferè in tota superficie ut in *G. ligustrifolio*. Antheræ glabræ. Stylus brevis, stigmate glabro.

Hab. In ins. Philippinis (*Cuming*, n. 864; *Lobb*, n. 450).

14. *G. lasiostemon*, Blume, Mus. Bot. p. 239, e Java, mihi ignotum.

XV. DESFONTAINIA, *Ruiz et Pavon*. Dun. in DC. Prod. vol. xiii. pars 1. p. 675.

Ovarium 5- rarius 4–3-loculare, septis in parte superiore ovarii vix in medio cohærentibus. Ovula in quoque loculo plurima (circa 10) ex angulo interno pendula. Bacca completè v. ferè completè 5–3-locularis.

Species unica:—

D. spinosa, R. et P. in Andibus Americæ australis crescens a Nova Granada usque ad fretum Magellanicum. Formæ sub nomine *D. splendentis*, H. B. K., *D. Hookeri*, Dun., et *D. acutangulæ*, Dun., editæ, inter se intermediis numerosis junctæ, vix pro varietatibus distinguendæ sunt.

* XVI. FAGRÆA, *Thunb.* Blume, Mus. Bot. p. 163.

Species sunt:—

§ 1. *Corymbosæ*, cymis pauciforis ad apices ramorum subcorymbosæ. Flores majusculi v. maximi.

* Longifloræ, *tubo corollæ longè exserto supra medium v. apice tantum ampliato*.

F. carnosa, Jack.—Moulmeyn (*Lobb*).

F. tubulosa, Bl. e Sumatra, ex auctore *F. carnosæ* affinis mihi ignota.

F. zeylanica, Thunb. In ins. Ceylon (Hb. Sm. e herb. Linn. fil., Gardner, &c.).

F. Berteriana, *A. Gray, MS.*, foliis obovato-oblongis obtusissimis v. breviter acuminatis longiusculè petiolatis coriaceis crassis obsoletè venosis, petiolorum basi stipulacea brevi rotundata, corymbo terminali brevi trifido v. trichotomo, corollæ tubo elongato supra medium ampliato calyce triplo longiore.—Arbor 30-pedalis affinis *F. zeylanicæ*, corollæ tubi parte tenui longè exserta, brevior tamen est, corolla tota 2½–3-pollicaris nec 4–5-pollicaris. Antheræ angustiores videntur.—*Carissa grandis*, Berter., et eo teste *Pua* incolarum.

Hab. In ins. Societatis (*Bertero, Bidwill, Hinds, Barclay*), ins. Nukahiva e Marquesas (*Barclay*), in Archipelago Louisiade dicto (*Macgillivray*).

F. lanceolata, Blume.—In Java (*Lobb, Junghuhn*). Species ab auctore optimè illustrata inter longifloras et latifloras ferè media.

F. Walliehiana.—F. lanceolata, Wall. Cat. n. 1599.—*Cyrtophyllum? lanceolatum*, A. DC. Prod. vol. ix. p. 31.—In ins. Penang (*Wallich*).—Cymæ subsessiles, laxè 3–5-floræ. Corollæ tubus tenuis longè exsertus. Flores multo minores quam in præcedentibus, duplo tamen longiores quam in *F. fragrante*.

** Latifloræ, *corollæ infundibuliformis tubo a basi v. jam infra medium usque ad faucem dilatato.*

F. auricularia, Jack.—Malacca (*Griffith*), Java (*Lobb, Zollinger*, &c.).

F. truncata, Blume, e Celebes, mihi ignota, huic affinis dicitur.

F. plumeriæfolia, A. DC.—In ins. Philippinis (*Cuming*).

F. obovata, Wall., Bot. Mag. t. 4205.—In montibus Khasia (*Wallich, Hook. fil. et Thomson*).

F. coromandeliana, Wight, Ic. t. 1316.—Specimen unicum vidi e Peninsula in herb. Stocks. Vix a præcedente differre videtur petiolis abbreviatis.

F. crassifolia, Blume (ex descr. et ic.).—In Malacca (*Griffith*), Rangoon (*MacLelland*).—*F. obovatæ* valdè affinis, differt paullulum floribus 1–3nis subsessilibus et fortè corollæ tubo breviore latiore.

F. globosa, Wall., e Chappedong et Tavoy, cujus flores ignoti sunt, est verosimiliter eadem ac *F. crassifolia*.

F. littoralis, Blume, a me non visa, paullulum differt ex icone, fructu oviformi.

F. obovata-javana, Blume, ex icone et descr. quasi intermedia videtur inter *F. obovatam* et *F. malabaricam*.

F. malabarica, Blume, Wight, Ic. t. 1317 (*F. obovata*, Griff. Notul. Pars iv. p. 35, Ic. t. 382), præcedentibus valdè affinis. Folia *F. obovatæ*, inflorescentia laxior, calyx brevior, corollæ paullo minores.—In peninsula indica (*Stocks*), specimina etiam vidi in horto Calcuttensi culta. Adsunt etiam specimina Ceylonensia a Champion et Thwaites lecta inflorescentia calyce

corollaque *F. malabaricæ* donata, foliis ut in *F. coromandeliana* brevè petiolatis. Forte 6 præcedentes omnes *F. oboratæ* varietates sunt.

F. KHASIANA, foliis longiusculè petiolatis oblongo-ellipticis acuminatis basi angustatis crassis subeveniis, cymis laxè trichotomis paucifloris, calycis laciniis margine membranaceis, corollæ tubo ferè a basi dilatato, ovario supernè uniloculari, bacca ovoideo-oblonga.—A præcedentibus floribus minoribus et baccis parvis primo intuitu distinguitur. Folia iis *F. obovatæ* angustiora, longius acuminata, 3–7 poll. longa, $1\frac{1}{2}$–$2\frac{1}{2}$ poll. lata, crassa, siccatione punctato-rugosa, costa subtus prominente, venis raro conspicuis. Corymbi subsessiles, laxi, bis terve trifidi, pedicellis ultimis 2–3 lin. longis. Flores quoad formam iis *F. malabaricæ* subsimiles sed vix sesquipollicares. Calyces 4–5 lin. longi, lobis orbiculatis margine latè attenuatis ferè scariosis. Corollæ tubi pars tenuis vix calyce longior. Ovarium disco crasso insidens, basi biloculare, superne uniloculare placentis ibidem parietalibus basi confluentibus. Bacca ferè matura 9 lin. longa, angustè ovoidea, ferè acuta. Semina pulpa carnosa semi-immersa, numerosa, testa maculata, albumine carnoso v. ferè cartilagineo. Embryo (in semine nondum maturo ?) minimus.

Hab. In montibus Khasia (*Griffith*, *Simons*, *D^r. Mack*, *Hook. fil. et Thomson*).

Speciem ut videtur novam ab Asa Gray edituram, præcedenti affinem, foliis latis, calyce minore, corollæ tubo longiore, legit *American Exploring Expedition* in ins. Feejee. Inflorescentia *F. lanceolatæ*, Wall., sed flores longè diversi.

F. minor, Blume, e Moluccis foliis basi non angustatis a plerisque hujus sectionis differt. Specimen vidi e Borneo (*Lowe*) cum icone Blumeana satis conveniens.

Supersunt species decem a Blumeo enumeratæ mihi omnino incognitæ.

§ 2. *Racemosæ*, cymis paucifloris brevibus secus pedunculum terminalem oppositis, in racemum plus minus elongatum dispositis.

F. racemosa, Jack, teste ipso Jackio, eadem est ac *F. volubilis*, Wall. Mihi forma videtur inter hanc et *F. morindæfoliam*, Blume, media et varietates tres in speciem unicam jungit, nomine antiquiore *F. racemosæ*, Jack, salutandam.

Hab. In Moluccis; frequens in Malacca, ins. Philippinis, &c.

F. CRASSIPES, foliis amplis ellipticis breviter acuminatis basi obtusis, petiolorum basi stipulacea brevissimè connata truncata, cymis plurifloris in racemum brevem subcorymbosum longè pedunculatum coarctatis, corolla crassa infundibulari laciniis subrotundis tubo lato triplo brevioribus.—Folia 10-pollicaria ferè *F. racemosæ* sed magis coriacea, venis arcuatis subtus prominentibus, petiolo brevi crasso torto. Pedunculus 6–10-pollicaris, crassus, medio interdum bracteis 2 subfoliaceis instructus. Cymarum paria 2–3, inferiores pedunculatæ, superiores coarctatæ, singulæ sub-5-floræ. Pedicelli pollicares, crassi. Calyx *F. racemosæ* v. paullo major. Corolla crassa, sesquipollicaris v. paullo longior, tubo basi lato, fauce ampliata minus tamen quam in *F. racemosa*, limbi lobis subæqualibus. Stamina lobis corollinis

paullo breviora. Ovarium completè biloculare, placentis in medio dissepimento bifidis. Bacca junior ferè globosa. Affinis ex descr. *F. coarctatæ*, Blume, cujus tamen corolla cum illa *F. morindæfoliæ* (*F. racemosæ*) comparatur.

Hab. In ins. Labuan (*Motley*).

F. LIGUSTRINA, *Blume*, var.? *brachystachya*.—Pedunculus 1½–2-pollicaris. Racemi rhachis 1–1½-pollicaris. Cymæ sessiles, oppositæ, trifloræ. Pedicelli breves. Corolla pollicaris, tubo tenui supra medium campanulato, dilatato. Ovarium supernè uniloculare, placentis ibidem parietalibus basi confluentibus.

Hab. In Singapore (*Lobb*).

Species Blumeana vera, cum aliis sex ejusdem auctoris hujus sectionis mihi ignotæ sunt.

§ 3. *Parvifloræ*, corymbis supradecompositis multifloris.

F. fragrans, Roxb.—*F. peregrina*, Blume? In Martabania et Penang (*Wallich*), Tavoy (*Gomez*), Mergui et Malacca (*Griffith*).

F. speciosa, Blume.—*F. elliptica*, Roxb.?—In Java (*Lobb*, n. 76).

F. Kimangu et *F. picrophlœa*, Blume, mihi ignotæ sunt.

F. tetragona, Spanoghe, Linnæa, vol. xv. p. 326, ex descr. e genere removenda erit.

F. Malayana, Mart., est forte *Tabernæmontana corymbosa*?

XVII. POTALIA, *Aubl.* DC. Prod. vol. ix. p. 36.

Species unica:—

P. amara, Aubl.—*P. resinifera*, Mart.—In Cayenna (*Martin*). Ad Rio Negro superiorem (*Spruce*).

XVIII. ANTHOCLEISTA, *Afzel.* DC. Prod. vol. ix. p. 96.

Species unica:—

A. nobilis, Don.—*A. macrophylla*, Don.—*A. Vogelii*, Planch. in Hook. Ic. t. 793, 794, et Fl. Nig. t. 43, 44.—In Africa tropica occidentali (*G. Don*, *Vogel*, &c.).

XIX. STRYCHNOS, *L.* A. DC. Prod. vol. ix. p. 12.

I. Species Asiaticæ v. Africanæ.

* SCANDENTES, *a brevifloris ad longifloras ordinatæ.*

1. S. MINOR, *Blume*, A. DC. Prod. vol. ix. p. 14, scandens, glabra v. minutè puberula, cirrhis simplicibus, foliis ovatis breviter acuminatis, cymis brevibus axillaribus terminalibusque, floribus plerisque tetrameris, corollæ tubo laciniis breviore.—Folia 3–5-nervia, nunc glaberrima, nunc uti petioli ramuli juniores et inflorescentia plus minus pubescentia, pilis minutis strigosis.

Cirrhi oppositifolii (folio subtendente abortiente squamæformi). Cymæ petiolo paullo longiores. Calyx profundè 5-fidus, lobis ovatis ciliatis nunc obtusissimè rotundatis, nunc acutiusculis. Corolla vix 1½ lin. longa, laciniis supra barbatis. Antherarum loculi basi ciliis paucis barbati. Ovarium biloculare, ovulis in quoque loculo 8–10. Bacca mono- vel oligo-sperma.

Hab. In ins. Ceylon, ubi varietates sequentes observantur :—

α. nitida, foliis ovatis subbipollicaribus basi angustatis, petiolo 2–3 lin. longo, cymis laxioribus terminalibus axillaribus.—In ins. Ceylon (*Walker*, *Thwaites*, n. 2516). Huc etiam pertinere videtur Icon Rheedii, vol. vii. t. 5.

β. ovata, foliis paullo minoribus, basi rotundatis opacis, cymis plerisque axillaribus densis paucifloris.—In ins. Ceylon (*Kelaart*).

γ. angustior, foliis angustius ovatis magis acuminatis, petiolo 1–2 lin. longo, cymis plerisque axillaribus.—In ins. Ceylon (*Walker*, *Thwaites*, n. 187).

δ. parvifolia, foliis vix pollicaribus, ovatis v. rarius obovatis, cymis paucifloris plerisque terminalibus.—In ins. Ceylon (*Gardner*, n. 580).

2. S. COLUBRINA, *Linn.* ?, A. DC. Prod. vol. ix. p. 14 ?, glabra, scandens, cirrhis plerisque bifurcatis, foliis ovatis ellipticisve obtusis v. vix acuminatis, cymis laxis axillaribus terminalibusque, floribus plerisque pentameris, corollæ tubo laciniis breviore.—*Modira Caniram*, Rheede, Hort. Malab. vol. viii. t. 24.—*S. bicirrhosa*, Lesch., A. DC. Prod. vol. ix. p. 16.—Folia nunc iis *S. minoris* similia, nunc sæpius majora et proportione longiora. Cirrhi ut in *S. minore* oppositifolii, folio subtendente ad squamam reducto, sed sæpius bifidi sunt et sub bifurcatione bibracteolati ; rarius occurrunt hinc inde simplices. Flores magnitudine *S. minoris*, sed semper pentameros nec tetrameros vidi. Fructus multo major quam in *S. minore*.

Hab. In Peninsula Indiæ Orientalis, in montibus Nilgherry (*Leschenault*), circa Madras (*Wight*, Wall. Cat. 1589 A, B, & C, et 4455 B*), in Terra Canara (*Law*). Specimina in herbariis nostris ad speciem ritè elucidandam haud sufficiunt.

3. S. MALACCENSIS, scandens, minute puberula, cirrhis simplicibus v. in ramulis aphyllis geminis, cymis interruptè paniculatis, pedicellis brevissimis, floribus pentameris, corollæ tubo laciniis breviore.—*S. colubrina*, Wall. in Roxb. Fl. Ind. vol. ii. p. 261 ?—Folia in specimínibus suppetentibus latè ovata, 3-pollicaria, quintuplinervia, costis petiolis ramulis inflorescentiaque puberulis ; folia adulta coriacea glabrata. Pedunculi axillares, folio sublongiores, ad apicem cyma densa coronati, additis cymis 2 v. 4 secus pedunculum per paria dissitis. Flores parvi *S. colubrinæ*. Laciniæ corollæ prope basin densè barbati. Antheræ basi barbatæ.

Hab. In Malacca (*Griffith*). Species ulterius cum *S. colubrina* comparanda.

4. S. AXILLARIS, *Colebr.*, A. DC. Prod. vol. ix. p. 13, scandens, cirrhis simplicibus, foliis ovatis acuminatis, cymis densis axillaribus, floribus pentameris, corollæ tubo laciniis breviore.—Ramuli novelli pubescentes demum glabrati. Folia 1½-2½-pollicaria, acumine longo angusto. Cirrhi sæpius axillares folio subtendente perfecto, inferiores interdum more *S. minoris*

* 1589 D. est *Celtis Wightii*, 4455 A. est *Strychnos nux-vomica*.

oppositifolii, nonnulli etiam in ramulos foliiferos abeunt. Flores fere *S. minoris*, sed semper pentameros vidi.

Hab. In montibus Khasia (*Wall.* Cat. n. 1587, *Griffith*, *Hook. fil. et Thomson*).

5. S. PANICULATA, *Champ.*, Benth. in Kew Journ. Bot. vol. v. p. 67, glabra, subscandens, ecirrhosa?, foliis ovatis, paniculis thyrsoideis plerisque terminalibus folio longioribus, pedicellis calyce multo longioribus, floribus tetrameris, corollæ tubo laciniis multo breviore.—Antheræ filamento suo æquilongæ basi parcè ciliatæ.

Hab. In ins. Hong Kong (*Champion*).

6. S. MULTIFLORA, glabra, subscandens?, ecirrhosa?, foliis amplis ovatis ellipticisve, paniculis folio sublongioribus laxè floribundis, pedicellis calyce sublongioribus, floribus pentameris, corollæ tubo lacinias æquante.—Ramuli læves. Folia 4–8 poll. longa, 2–4 poll. lata, breviter et obtusè acuminata, quintuplinervia, petiolo 3–4-lineari. Inflorescentia ferè *S. paniculatæ* sed pedicelli proportione breviores. Flores majores, semper pentameri. Corollæ tubus 1½ lin., laciniæ 1¼ ad 1½ lin. longæ, basi barbatæ. Antheræ imberbes. Ovarium villosum. Stylus elongatus. Bacca globosa oligosperma, maturam non vidi. Affinis *S. laurinæ*. Folia latiora. Corollæ majores laciniis longioribus.

Hab. In ins. Philippinis (*Cuming*, n. 641, 695, 1059 & 1482).

7. S. LAURINA, *Wall.*, A. DC. Prod. vol. ix. p. 13, glabra, subscandens, cirrhis bifidis, foliis ovali-ellipticis oblongisve subacuminatis 3–5-plinerviis, paniculis axillaribus folio brevioribus, terminalibus amplis multifloris, floribus pentameris, corollæ tubo laciniis paullo longiore.—Folia 4–6-pollicaria. Paniculæ puberulæ. Pedicelli ultimi abbreviati. Corollæ tubus 1½ lin. longus, supernè latior, laciniæ vix lineam longæ, densè barbatæ. Ovarium villosum. Bacca parva videtur, sed in specimine immatura.

Hab. Tavoy (*Gomez*), Mergui (*Griffith*).

8. S. ANGUSTIFLORA, glabra, scandens, cirrhis simplicibus apice incrassatis, foliis ovato-acuminatis orbiculatisve, cymis terminalibus pedunculatis laxis folio brevioribus pubescentibus, floribus pentameris, corollæ tubo laciniis elongatis sublongiore.—Folia parva, raro 2 pollices excedentia, latitudine quam maximè varia. Cymæ iis *S. Nux-vomicæ* minores. Calyx minimus. Corolla 4 lin. longa; laciniæ basi intus villosæ, angustiores et longiores quam in omnibus mihi notis speciebus. Ovarium et stamina glaberrima. Bacca globosa.

Hab. In ins. Hong Kong (*Hinds*, *Champion*, planta a me olim dubitanter ad *S. colubrinam* relata).

9. S. WALLICHIANA, *Steud.*, DC. Prod. vol. ix. p. 13, glabra, foliis ovato- v. oblongo-ellipticis longè acuminatis triplinerviis, cymis densis multifloris folio brevioribus, corollæ pentameræ tubo tenui laciniis intus basi villosis 4–5-plo longiore.—Folia plerique sub-5-pollicaria basi in petiolum brevem angustata, acumine abrupto semi-pollicari; in speciminibus nonnullis occurrunt latiora brevius acuminata ferè *S. ovalifoliæ*. Pedunculi axillares v. terminales, apice trichotomi, cymis ultimis subcapitatis. Corollæ tubus 4–5 lin. longus, laciniæ vix lineam. Antheræ subexsertæ, glabræ v. basi

pilis paucis ciliatæ. Ovarium glabrum; dissepimentum crassiusculum; placentæ peltatæ ovulis plurimis semi-immersis.

Hab. In montibus Khasia (*H. Bruce, Simons*).

10. *S. Tieute*, Blume, Rumphia, vol. i. t. 24, species Moluccana scandens, longiflora, fauce nuda, mihi ignota.

11. S. OVALIFOLIA, *Wall.*, DC. l. c. vol. ix. p. 13, scandens, cirrhosa, glaberrima, foliis ovatis ellipticisve obtusè acuminatis triplinerviis, paniculis axillaribus pedunculatis laxis folio subbrevioribus, floribus pentameris, corollæ imberbis? tubo laciniis pluries longiore.—*S. Wallichianæ* affinis, folia plerumque latiora, magis coriacea, venis transversis minus conspicuis. Inflorescentia laxior. Pedicelli calyce longiores. Flores in specimínibus meis nimis juveniles non ritè examinare potui, sed corolla intus glabra videtur. Tubus certe ut in *S. Wallichiana* elongatus.

Hab. In ins. Penang (*Wallich*).—*S. acuminata*, Wall., DC. l. c. p. 14, e Amherst et Chappedong videtur eadem species, sed flores et fructus desunt.

12. *S.* species, scandens, cirrhifera ex Africa tropica occidentali, floribus ignotis non definienda.

** ARBORESCENTES, *a longifloris ad brevifloras ordinatæ.*

13. S. NUX-VOMICA, *Linn.*, DC. l. c. p. 15, arborescens, foliis petiolatis ovatis 3–5-plinerviis glabris, corymbis terminalibus, corollæ imberbis tubo laciniis 3–4-plo longiore.—*S. ligustrina*, Blume, Rumphia, vol. i. p. 68. t. 25, ex ic. et descr.

Hab. Species ad oras Indiæ orientalis in ins. Ceylon et in Moluccis vulgaris.

14.? *S. lucida*, Br., DC. l. c. p. 16, ex Australia tropica, mihi ignota.

15. S. POTATORUM, *Linn. fil.*, DC. l. c. p. 15, arborescens, foliis brevissimè petiolatis ovatis oblongisve sub-5-plinerviis glabris, cymis ad ramos annotinos brevibus, floribus pentameris, calycis laciniis acuminatis, corollæ tubo laciniis paullo longiore, fauce villosissima.—Iconibus citatis adde *Wight Illustr.* vol. ii. t. 156. Corollæ tubus 1½ lin. longus.

Hab. In India orientali frequens, in Peninsula (*Wight*), Behar (*Hook. fil.*), Prome (*Wallich*).

16. S. UNGUACHA, *A. Rich.*, Walp. Rep. vol. iii. p. 72, arborescens, foliis petiolatis ovatis oblongisve glabris, cymis ad ramos annotinos brevissimis densis, floribus plerisque tetrameris, calycis laciniis suborbiculatis, corollæ tubo laciniis incrassatis sublongiore, fauce breviter villosa.

Hab. In Abyssinia (*Schimp.* Ser. 3. n. 1817) et forte eadem species floribus 4–5-meris, in Senegambia (*Heudelot*, n. 801).

17. *S. Lokua*, A. Rich., Walp. l. c., ex Abyssinia, a me non visa. Ex charactere differre videtur a præcedente pube, a sequente foliorum forma. Flores ignoti sunt.

18. S. DYSOPHYLLA, arborescens, foliis petiolatis obovatis orbiculatisve utrinque velutino-pubescentibus, cymis ad ramos annotinos brevissimis densis, floribus tetrameris, calycis laciniis suborbiculatis, corollæ tubo laciniis in-

crassatis sublongiore, fauce breviter villosa.—An *S. Unguachæ* var. insiguis, foliis utrinque densè molliterque pubescentibus?

Hab. In Africa austro-orientali subtropica ad sinum Delagoa (*Forbes*).

II. Species Americanæ.

* *Longifloræ arborescentes.*

19. *S. pseudochina*, A. de St. Hil.; A. DC. Prod. vol. ix. p. 14.—Frequens in campis altis prov. Minas Geraes et Goyaz (*Gardner*, n. 4273 & 5007, *Pohl*, *Claussen*, *Martius*, &c.).

20. *S. triplinervia*, Mart.; A. DC. l. c.—*S. Gomeziana*, Casar. Stirp. Nov. p. 14; Walp. Rep. vol. vi. p. 497. Prope Rio Janeiro (*Gardner*, *Tweedie*, *Gomez*, &c.).

** *Longifloræ scandentes vulgo cirrhiferæ.*

21. S. RONDELETIOIDES, *Spruce*, scandens, glabra, foliis ovatis oblongisve breviter acuminatis coriaceis, cymis paniculatis terminalibus, pedicellis brevibus, corollæ pulveraceo-tomentellæ tubo laciniis duplo longiore.—Frutex altè scandens, cirrhis simplicibus incrassato-dilatatis. Folia superiora circa 3 poll. longa, 1½ poll. lata, basi rotundata; inferiora sæpè semipedalia, circa 2 poll. lata, basi angustata; omnia demum coriacea, 3–5-plinervia, supra nitida, subtus pallida, petiolo 3–4-lineari. Paniculæ foliis superioribus vix longiores, ramis oppositis, floribus ad apices ramulorum confertim cymosis suaveolentibus. Calyces sessiles v. breviter pedicellati, parvi, laciniis latè triangularibus acutis apice sæpè recurvis. Corollæ ochroleucæ tubo 3 lin. longo, laciniis 1½ lin. lanceolatis obtusiusculis intus basi lanatis. Stamina infra apicem tubi inserta, glabra; antheræ oblongæ, apiculatæ. Ovarium glabrum, dissepimento tenui. Ovula pauca. Stylus exsertus, stigmate capitato.

Hab. Frequens in "gapo" ad Rio Uaupès ubi Uirarì-rána vocatur (*Spruce*, n. 2419).

22. S. TOXIFERA, *Schomb.*, DC. Prod. vol. ix. p. 16, scandens, pilis longis rufis patentibus hirsutissima, foliis ovatis v. oblongo-ellipticis acuminatis membranaceis, cymis pauciflœris subcapitatis terminalibus, corollæ hirsutissimæ tubo laciniis 3–4-plo longiore.

Hab. In Guiana anglica (*Rob. Schomb.* coll. 1. n. 155, coll. 2. n. 770; *Rich. Schomb.* n. 1465). Confer *Schomb.* in Ann. Nat. Hist. vol. vii. p. 411, *t.* 12 & 13; *Hook.* Ic. t. 364; *Walp.* Ann. Bot. vol. i. p. 512.

23. S. TOMENTOSA, scandens, foliis ovatis oblongisve supra adpressè hirtellis subtus ramulisque rufo-tomentosis, cymis terminalibus confertim pauciflœris, corollæ hirsutissimæ tubo laciniis subtriplo longiore.—Rami juniores tomentosi, demum glabrati. Folia breviter petiolata, in speciminibus suppetentibus 1–2 poll. longa, obtusa v. acuta, basi rotundata, 5- v. ferè 7-nervia, pilis paginæ superioris brevibus appressis, tomento inferioris denso molli. Inflorescentia fere *S. toxiferæ* sed laxior. Calycis laciniæ dimidio breviores, ovato-acuminatæ. Corolla ferè *S. toxiferæ*, sed in speci-

minibus paucæ nondum apertæ. Antheræ ut in illa ovato-oblongæ obtusæ vix apiculatæ. Ovarium glabrum, dissepimento tenuissimo.

Hab. In Guiana anglica, in montibus Roraima (*Rob. Schomb.* coll. 2. n. 723; *Rich. Schomb.* n. 1075).

24. *S. brachiata*, Ruiz & Pav., A.DC. Prod. vol. ix. p. 15, e Peruvia, a me non visa.

25. S. SMILACINA, glabra, foliis (amplis) ellipticis oblongisve coriaceis, cymis axillaribus brevissimis pauciforis v. secus ramulos axillares aphyllos folio breviores oppositis, calycis laciniis orbiculatis obtusis, corollæ pentameræ punctato-tomentellæ tubo laciniis plus duplo longiore.—Folia semipedalia v. longiora. Flores nunc in axillis 3–5 fasciculati breviter pedicellati, nunc sæpius in cymulas breves oppositas dispositi, paniculam axillarem racemiformem constituentes. Corollæ tubus 3 lin. longus, laciniæ vix linea longiores, obtusæ, intus basi parcè piloso-lanatæ.

Hab. In Guiana anglica (*Rob. Schomb.* coll. 2. n. 775, *Rich. Schomb.* n. 1516), Cayenne (*Martin*).

26. S. GARDNERI, *A. DC.* Prod. vol. ix. p. 14. Frutex scandens hinc inde cirrhifer, nec arbor. Flores pentameri, corollæ tubo punctato-tomentello laciniis duplo longiore.

Hab. In prov. Goyaz Brasiliæ, in sylvis prope Arrayas (*Gardner*, n. 3890), et ut videtur eadem in Guiana anglica ad flumen Corentyne superius (*Rob. Schomb.* specimen unicum).

27. S. PEDUNCULATA; *Rouhamon pedunculatum*, A. DC. Prod. vol. ix. p. 561. Frutex scandens, præcedenti similis, sed flores tetrameri, corollæ tubo laciniis vix dimidio longiore.

Hab. In montibus Roraima Guianæ anglicæ (*Rob. Schomb.* coll. 1. n. 482 & 792).

28. S. DARIENSIS, Seem. Bot. Herald, p. 166.—Præcedentibus affinis et præsertim sequenti simillima. Folia tamen basi angustata nec ut in sequente rotundata. Flores non vidi. Secundum Seemann glabri sunt. An *S. cogentis* varietas?

Hab. In maritimis ins. Coyba et oræ Darienensis Americæ centralis (*Seemann*).

29. S. COGENS, *Schomb.*, DC. Prod. vol. ix. p. 16.—In specimine Schomburgkiano ramuli steriles pubescentes sunt, folia sæpius glabra; in Spruceanis ad eandem ut videtur speciem pertinentibus rami fructiferi glabri, paniculæ axillares, oblongæ, 1–2-pollicares, a basi ramosæ. Calycis laciniæ 5, parvæ, lanceolatæ, acutæ. Baccæ globosæ, flavescentes, seminibus 1–2 orbiculatis. Corollæ desunt.

Hab. In Guiana anglica (*Rob. Schomb.* coll. 1. n. 156). In "gapò" ad Rio Uáupès (*Spruce*, n. 2634) et specimen defloratum e Cayenna (*Martin*) huc etiam pertinere videtur.

30. S. LANCEOLATA, *Spruce*, scandens, ramulis hirtellis, foliis oblongo-lanceolatis acutis, cymis abbreviatis axillaribus, corollæ tubo laciniis densissimè lanatis vix longiore.—Cirrhi supernè demum valdè incrassati. Folia brevissimè petiolata, circa 2 poll. longa, 6–9 lin. lata, in specimine fructifero 3 poll. longa, 1 poll. lata, 3–5-plinervia, subtus ad axillas costarum barbata,

costis minutè puberulis, cæterum glabra. Cymæ laxæ, subsessiles, glabræ, pedicellis 1–2 lin. longis. Flores ochroleuci, suaveolentes, pentameri. Calyces glabri, laciniis breviter lanceolatis acutis. Corolla ferè *S. Rouhamon* sed tubus 1½ lin. longus; laciniæ lanceolatæ vix breviores, lana interiore nivea densissima. Stamina ad faucem inserta; filamenta complanata, ad medium laciniarum attingentia; antheræ parvæ, ovatæ. Ovarium glabrum, carnosulum, dissepimento crassiusculo. Bacca flavescens, hinc planiuscula illinc convexa (loculo uno abortiente?). Semina 1–2.

Hab. In "gapò" ad ostium fluminis Uaupès et ad cataractas San Gabriel ad Rio Negro (*Spruce*, n. 2084 & 2375).

*** *Brevifloræ* (*corollæ tubo laciniis breviore*) *cymis axillaribus.*

31. S. ROUHAMON, fruticosa, subcirrhifera, foliis ellipticis obovatis oblongisve basi angustatis subtus ad venas ramulisque tomentellis, cymis axillaribus brevibus, floribus 4–5-meris, corollæ tubo laciniis intus densissimè lanatis breviore.—*Rouhamon guianense*, Aubl., DC. Prod. vol. ix. p. 17.—*R. divaricatum*, DC. l. c.

Hab. In Guiana anglica et gallica.

32. S. SUBCORDATA, *Spruce*, scandens, cirrhifera, ramulis hirtis, foliis subsessilibus ovato-lanceolatis basi plerisque cordatis subtus ad venas pubescentibus, cymis brevissimis axillaribus laxè 3-5-floris, floribus plerisque tetrameris, corollæ tubo brevi.—Frutex scandens. Folia majora bipollicaria, pollicem lata, acutiuscula, inferiora breviora et latiora, ramealia multo angustiora, ferè omnia basi cordata, consistentia papyracea v. demum coriacea. Calycis laciniæ parvæ, hirtellæ. Corollam nonnisi emarcidam vidi. Bacca cerasiformis, viridis, 1–2-sperma.

Hab. In sylvis ad Barra do Rio Negro (*Spruce*, n. 1237).

33. S. BREVIFOLIA, *Spruce*, scandens, cirrhosa, ramulis pubescentibus, foliis subsessilibus cordato-ovatis subtus vel utrinque hirtellis, floribus axillaribus 1–3-nis subsessilibus plerisque tetrameris, corollæ tubo brevissimo.—Affinis *S. subcordatæ*. Folia vix unquam pollicem longa. Flores minores pedicellis subnullis. Calyces tamen majores et ferè glabri. Baccam non vidi. Flores ex *Spruce* ochroleuci suaveolentes.

Hab. In "Capoeiras" ad ostium flum. Uaupès (*Spruce*, n. 2087.)

34.? *S. Mitscherlichii*, Schomb.; Walp. Ann. vol. i. p. 512.—In Guiana anglica (*Rich. Schomb.*). Species a me non visa.

35.? S. HIRSUTA, *Spruce*, arborescens, pilis longis rufis patentibus hirsuta, foliis amplis oblongo-ellipticis acuminatis, floribus axillaribus sessilibus glomeratis pentameris, calycis laciniis lanceolatis hirsutis.—Arbor gracilis 20-pedalis (ex *Spruce*). Ramuli, costæ paginæ inferioris foliorum, calyces et bracteæ rufo-hispidi. Folia semipedalia, ferè sessilia, basi rotundata, apice longè et angustè cuspidata, 5-nervia, papyracea, supra glaberrima. Flores in axillis (uti de *S. Mitscherlichii* prædicatur) densè aggregati, bracteis lanceolatis acutis calyces superantibus. Calyx 1½ lin. longus. Corollam non vidi. Ovarium apice pilosum, biloculare, ovulis paucis. Bacca glabra, oblonga, apice obliqua, semipollicaris, abortu monosperma.

Hab. In sylvis umbrosis Managuiry ad Rio Negro (*Spruce*).

36. S. PARVIFLORA, *Spruce*, foliis amplis oblongo-ellipticis glabris, cymis axillaribus paniculatis multifloris, floribus minimis pentameris, corollæ canescentis tubo brevissimo laciniis crassis medio lanatis.—Species inflorescentia distinctissima, flores parvi sequentium. Frutex est altè scandens. Ramuli tomento minutissimo flavicantes, demum glabri. Folia breviter petiolata, usque ad 8–10 poll. longa, 3–4 poll. lata, apice acuminata, basi cuneato-rotundata, demum crasso-coriacea, costis subtus elevatis. Paniculæ vel axillares vel ad basin innovationum oppositæ foliis floralibus abortientibus, pedunculatæ, trichotomæ, floribundæ, cymis ultimis densis. Flores in cymulis sessiles, suavcolentes, virentes, siccitate canescentes, vix lineam longi. Calyx minutus, laciniis latis obtusis ciliolatis. Corollæ tubus omnium brevissimus, staminibus versus basin affixis; laciniæ crassæ, intus breviter lanatæ. Ovarium glabrum, stylo brevi.

Hab. In "gapò" ad Rio Uaupès (*Spruce*, n. 2482).

**** *Brevifloræ* (*corollæ tubo brevissimo*) *cymis terminalibus.*

37. S. MARGINATA, suffruticosa, glaberrima, foliis ovatis orbiculatisve obtusissimis margine incrassatis, cymis terminalibus corymbosis, floribus 4–5-meris, corollæ extus glabræ tubo brevissimo.—Suffrutex 1–2-pedalis. Folia rigida 5-plinervia, venosa, basi apiceque obtusissima v. retusa, petiolo vix lineam longo. Cymæ nunc paucifloræ subsimplices, nunc multifloræ in paniculam seu corymbum basi trifidum dispositæ. Pedicelli brevissimi. Calyces parvi, lobis acutis. Corolla 1½ lin. longa, alba, laciniis intus villosolanatis.

Hab. In collibus arenosis Missionum Duro prov. Goyaz (*Gardner*, n. 3322, caule bipedali foliis 1–1½-pollicaribus) et ad Chapada da Mangabeira ejusdem provinciæ (*Gardner*, n. 3323, caule pedali foliis semipollicaribus sed inflorescentia vix evoluta).

38. S. BRASILIENSIS, *Mart.*, subarborescens, ramulis puberulis rarius glabratis, foliis ovatis submembranaceis v. tenuiter coriaceis margine tenui, cymis corymbosis terminalibus pauciforis, floribus pentameris, corollæ tubo brevissimo, laciniis medio barbatis.—Arbor parva (sub-15-pedalis) interdum spinis cirrhisve axillaribus hinc inde armata. Folia 1–1½ v. rarius 2 poll. longa, acuta v. obtusa basi rotundata v. angustata. Flores vix 1½ lin. longi. Baccæ cerasiformes aurantiacæ v. flavescentes, 1–2-spermæ.—Varietates tres vidi: *a, normalis*, glabriuscula sæpè floribunda axillis sæpè spiniferis; *S. brasiliensis* et *S. breviflora*, DC. Prod. vol. ix. p. 15. Prope Rio Janeiro præsertim in monte Corcovado (*Sello, Lhotsky, Gomez*, &c.).—*β, minor*, puberula, foliis minoribus, floribus paullo majoribus, inflorescentia densiore, ramulis hinc inde apice spinescentibus axillis nonnunquam cirrhiferis. In Serra Acurua prov. Bahia (*Blanchet*, n. 2792), ad Rio Tapajoz prope Santarem (*Spruce*, n. 704).—γ, *rigida*, ramulis evidentius tomentosis, foliis subtus plus minus hirtellis. In campis apertis montosis prope San Antonio (*Gardner*, n. 2085).

39. *S. rubiginosa*, DC. Prod. vol. ix. p. 16. Frutex v. arbor 6–20-pedalis. Flores vix linea longiores, pentameri. Ad Rio San Francisco (*Blanchet*, n. 2918), in districtu Paranagoa, prov. Piauhy (*Gardner*, n. 2660 & 2661).

40. S. Castelnæi, *Wedd.* in Castelnau Expéd. Amér. Sud, vol. v. p. 22, scandens, cirrhosa, ramulis ferrugineo-villosis foliis elliptico-oblongis membranaceis nervis subtus ferrugineo-pilosis, cymis corymbosis terminalibus multifloris ferrugineo-tomentosis, corollæ tubo brevi laciniis apice barbulatis.—Caules altè scandentes demum glabrati. Folia palmaria, acuminata, nitidula glabraque v. puberula, nervis supra pubescentibus imprimis subtusque ferrugineo-pilosis; floralia pollicaria, bracteæformia, basi incrassata et reticulata. Cymæ vix bipollicares in ramulis annuis terminales. Calyces bracteis nonnullis linearibus involucrati, lobis obtusis. Corolla inconspicua, breviter infundibuliformis, ad faucem nuda. Antheræ basi barbellatæ. (Descr. ex Weddel. l. c. et vidi specim. in herb. Mus. Par.)

Hab. Ad ripas fluminis Amazon inter flumina Ucayala et Tabatinga (*de Castelnau*).

Species non satis notæ sunt:—

S. Ignatia, Juss. Semina a Gærtnero aliisque depicta ad *Strychnum* quendam (an *S. multiflorum*?) ex ins. Philippinis pertinent. Flores a Linnæo filio sub nomine *Ignatiæ amaræ* descripti, *Posoqueriam longiflorum* e Guiana referrunt.

S. farinosa, Blume.—DC. Prod. vol. ix. p. 16, e Madagascaria.

S. innocua, Delile.—DC. l. c. e Nubia.

S. Curare, H. B. K.—*Roukamon*? *Curare*, A. DC. Prod. vol. ix. p. 17.

S. Panamensis, Seem. Bot. Herald, p. 166.

Species excludendæ:—

S. grandis, Wall. = *Anisophyllum grande.*

S. 5500 Wall. Cat. Planta dubia, certè non hujus ordinis.

S. oblongifolia, Hochst. = *Carissa oblongifolia.*

S. scandens, Schum. & Thonn. = *Apocynea*?

XX. Brehmia, *Harv.*, A. DC. Prod. vol. ix. p. 19.

Species unica:—

B. spinosa, Harv.; A. DC. l. c.—In Madagascaria, Africa austro-orientali et tropica usque ad Senegambiam (*Heudelot*).

XXI. Labordea, *Gaud.*, A. DC. Prod. vol. ix. p. 21.

Species unica:—

L. fagroidea, Gaud.; DC. l. c.—In ins. Sandwichensibus. A me non examinata.

XXII. Nicodemia, *Ten.* Cat. Hort. Napol. p. 88.

Species sunt:—

1. *N. diversifolia*, Ten. l. c.; Walp. Ann. vol. i. p. 531.—*Buddleia diversifolia*, Lam.; Benth. in DC. Prod. vol. x. p. 445.—In ins. Mauritio et Madagascar.
2. *N. rondeletiæflora.*—*Buddleia rondeletiæflora*, Benth. l. c. p. 445.—In ins. Johanna Comores.

XXIII. GARDNERIA, *Wall.*, DC. Prod. vol. ix. p. 19.

Species sunt :—

1. G. OVATA, *Wall.*, DC. l. c. p. 20, pedunculis trifidis trichotomisve, corollæ lobis obtusis, antheris connatis, ovarii loculis uniovulatis.—Wall. Pl. As. Rar. vol. iii. t. 231.—*G. Wallichiana*, Wight in Wall. Pl. As. Rar. vol. iii. t. 281; Wight, Ic. t. 1313.

Hab. In montibus Khasia (*M. R. Smith, Griffith, Hook. fil. & Thoms.*); in montibus Peninsulæ Indiæ Orientalis (*Wight, Gardner, Schmidt, Hohenacker*, n. 1445, sub nom. Ardisiaceæ tetrameræ).

2. G. ANGUSTIFOLIA, *Wall.*, DC. l. c., pedunculis unifloris recurvis rarissimè bifloris, corollæ lobis acuminatis, antheris liberis, ovarii loculis collateraliter biovulatis.—*G. nutans*, Sieb. & Zucc. Fam. nat. Fl. Jap. pars 2. p. 41.

Hab. In jugo Himalaico, in Napalia (*Wall.*), in Kemaon (*Madden, Strachey & Winterbottom*), in montibus Sikkim (*Hook. fil.*) et Khasia (*Hook. fil. & Thoms.*), et in Japonia (*Siebold*).

XXIV. PAGAMEA, *Aubl.*, DC. Prod. vol. ix. p. 19.

Flores sæpè polygamo-dioici. Ovarium perfectum, biloculare; ovula in loculis solitaria, e basi erecta. Bacca seu drupa nigra v. virescens, dipyrena, pyrenis crustaceis v. ferè osseis, intus planis, dorso convexis. Semen erectum, testa tenui, albumine cartilagineo sulcato-runcinato. Embryo parvus, subteres, prope basin albuminis erectus, radicula recta, cotyledonibus æquilonga.

Species sunt :—

1. P. CAPITATA, foliis ovato-lanceolatis acuminatis margine revolutis subtus inflorescentiaque hirtellis, florum glomerulis ad apicem pedunculi capitatis bracteatis.—Partes juniores pilis brevibus mollibus hirtæ et ut videtur viscidulæ. Stipulæ quam in cæteris Pagameis breviores et diutius persistentes; vaginæ vix 2 lin. longæ, dentes breves. Folia forma ferè *P. guianensis*, sed magis acuminata, rigidiora, 2–2½ poll. longa, supra nitidula, margine in sicco semper revoluta, venis primariis secus costam utrinque 4–6 prominulis subplicata. Pedunculi compressi, foliis breviores, capitulo denso depresso, bracteis linearibus foliaceis sæpius 2–4 flores superantibus. Flores tetrameri. Corollæ lobi intus ferè glabri. Stylus bifidus.

Hab. In Guiana anglica (*Rob. Schomb.* coll. 2. n. 578; *Rich. Schomb.* n. 870) et in Surinama (*Hostmann*, n. 801).

2. P. PLICATA, *Spruce*, foliis (amplis) ovali-ellipticis subtus molliter pubescentibus, venis primariis valdè prominentibus, florum glomerulis interruptè spicatis.—Arbor 30-pedalis. Stipulæ elongatæ. Folia 6–8 poll. longa, 3–4 poll. lata, petiolo triquetro sæpè ultra pollicem longo, supra glabra, subtus canescentia, inter costas insigniter plicata, præsertim in vivo teste Spruceo. Pedunculi 2–4-pollicares, valdè compressi, uti calyces leviter puberuli. Inflorescentia *P. guianensis*, sed flores et fructus majores; corollas tamen non vidi.

Hab. In campo quodam arenoso parvo prope San Gabriel do Cachoeiras ad Rio Negro Brasiliæ septentrionalis detexit *R. Spruce*.

Var. β. glabrescens, foliis subtus parcè villosis. Corollæ tubus brevis, laciniæ intus breviter paleaceo-villosæ. In Brasiliæ prov. Pernambuco ad Rio Preto legit *G. Gardner*, n. 2891.

3. P. GUIANENSIS, *Aubl.*, DC. Prod. vol. ix. p. 19, glabra, foliis ovato-lanceolatis oblongisve planis, florum glomerulis interruptè spicatis, corollæ lobis intus paleaceo-villosissimis.—Frutex v. arbor parva 6–15-pedalis. Folia 1½–2 rarius 3 poll. longa. Flores albi. Baccæ demum nigricantes.

Hab. Frequens in Guiana anglica et gallica, in Surinama et in Brasilia boreali usque ad Bahiam.

4. P. SESSILIFLORA, *Spruce*, glabra, foliis oblongo-lanceolatis planis, florum glomerulis inter folia suprema arctè sessilibus, corollæ lobis intus villosis. —Arbor parva, ramosissima, 6–15-pedalis. Folia quam in *P. guianensi* minora, apice basique angustata. Stipulæ latæ, membranaceæ, caducissimæ. Flores magnitudine *P. guianensis*. Calycis margo 4–5-dentatus. Corolla pallidè virens, villis quam in *P. guianensi* brevioribus. Baccæ ovoideo-globosæ, non didymæ. Semina profundè sulcato-rugosa.

Hab. In sylvis humilioribus prope San Carlos do Rio Negro (*Spruce*).

5. P. THYRSIFLORA, *Spruce*, glabra, foliis ovato-lanceolatis oblongisve planis, florum glomerulis pedunculatis thyrsoideo-paniculatis, corollæ lobis intus brevissimè paleaceo-hirtis.—Arbor 6–15-pedalis, densè ramosa, in omnibus *P. guianensi* similis, nisi inflorescentia laxa, interdum ferè corymbosa, glomerulis inferioribus longiusculè pedunculatis et floribus (albis) minoribus corollæ lobis intus paleis brevissimis candidis nec pilis longis paleaceis obtectis. Stylus semibifidus. Baccæ quam in *P. guianensi* minores, obovoideo-globosæ nec didymæ. Semina hemisphærica, intus profundè bisulcata, dorso leviter corrugata.

Hab. In sylvis humidis prope San Carlos do Rio Negro (*Spruce*).

6. P. MACROPHYLLA, *Spruce*, glabra, foliis amplis ovali- vel oblongo-ellipticis breviter acuminatis, panicula ramosa petiolum vix superante, corollæ lobis intus densè villosis.—Arbor 15–20-pedalis, ramulis crassiusculis. Folia 6–8 poll. longa, 3–4 poll. lata, basi in petiolum sesquipollicarem angustata, subcoriacea, plana, glabra at opaca, subtus punctis lepidotis minutis creberrimis pallida; costa venisque primariis utrinsecus 8–9 subtus prominentibus. Stipulæ 1½–2-pollicares, acuminatæ, connatæ, superiores circa inflorescentias juniores medio inflatæ, membranaceæ, mox rumpentes et subcalyptratim deciduæ, basibus latis irregulariter truncatis persistentibus. Paniculæ in axillis supremis oppositæ, petiolo paullo longiores v. subbreviores, trichotomæ, densifloræ, rhachide compressa. Flores ad apices ramulorum brevium conferti, sessiles. Calyx cupuliformis, truncatus, tubo basi breviter carnoso, ovario pulvinato. Ovula in floribus a me examinatis minuta ut videtur abortiva. Corolla virescens, 4-fida, lobis intus densissimè paleaceo-pilosis.

Hab. Frequens in sylvis *Caa-tingas* dictis prope Panurè ad Rio Uaupès (*Spruce*).

7. P. CORIACEA, *Spruce*, glabra, foliis (amplis) ovali- v. oblongo-ellipticis coriaceis, paniculis folia subæquantibus, florum glomerulis secus ramos paniculæ interruptè spicatis.—Arbor gracilis 20–50-pedalis. Ramuli virides,

medulla ex Sprucco hexagona. Folia longè petiolata, subsemipedalia, in vivo crassa et viridia, venis vix prominulis. Stipularum vaginæ pollicares v. longiores, dentibus brevibus. Inflorescentiæ albidæ, subcarnosæ, folia breviter superantes, pedunculo compresso supra medium ramoso, glomerulis secus ramos sessilibus. Flores *P. guianensis*, albi, pili tamen leborum corollæ multo breviores. Stylus vix ad medium bifidus. Fructus *P. guianensis*, v. paullo major, apice emarginatus v. subdidymus.

Hab. In campis ad Rio Negro prope cataractas San Gabriel et ad Uananaca, necnon ad ripas fluminis Orenoco prope Esmeralda frequens (*Spruce*).

8. P. HIRSUTA, *Spruce*, undique pilis longis hirsuta, foliis amplis oblongo-ellipticis, florum glomerulis secus pedunculum paucis, summis sessilibus infimis breviter pedunculatis.—Folia petiolata, magnitudine *P. coriaceæ* et *P. plicatæ*, sed utrinque uti ramuli stipulæ et inflorescentiæ pilis longis subrufis patentibus hirsuta. Stipulæ sesquipollicares, connatæ, rufo-villosæ, caducissimæ. Pedunculi oppositi, folio breviores, ancipites. Capitula in parte superiore 3–5, summo terminali, pari superiore sessili, inferiore utrinque pedunculato. Calyx breviter hispidus, limbo brevi cupulato integro. Corollæ tubus duplo longior, laciniæ angustæ, acutæ, extus hispidæ, intus pilis brevibus palearcis vestitæ. Fructus *P. coriaceæ*, subdidymus.

Hab. In sylvis humilioribus ad flumen Guiaina seu Rio Negro superius, et prope San Carlos do Rio Negro (*Spruce*).

XXV. GÆRTNERA, *Lam.*, DC. Prod. vol. ix. p. 32; Blume, Mus. Bot. p. 173.

Sect. I. ÆTHEONEMA, *DC.*—Calyx amplus coloratus limbo campanulato.

Species unica:—

1. *G. calycina*, Boj. in DC. Prod. vol. ix. p. 35.

Sect. II. EUGÆRTNERA, *DC.*—Calyx parvus, limbo patente v. subcampanulato. Corollæ tubus elongatus intus nudus v. intra stamina leviter villosus.

2–14. Species 13 Mascarenses in 'Prodromo' enumeratæ cum sequentibus duabus Ceylonensibus.

15. G. ROSEA, *Thwaites*, foliis ovatis lanceolatisve acutè acuminatis, stipulis biaristatis, floribus ternis sessilibus, calyce truncato 5-dentato, corollæ tubo elongato intus leviter villoso, filamentis anthera longioribus medio tubo insertis.—Frutex dichotomè ramosus. Folia sub-bipollicaria. Vaginæ stipulares breves, aristis brevioribus longioribusve. Corollæ roseæ, 8–9 lin. longæ. Bacca subdrupacea, basi contracta.

Hab. In ins. Ceylon (*Walker*, *Thwaites*).

16. G. WALKERI, *Wight*, Illustr. vol. ii. t. 156, foliis oblongis lanceolatisve acutè acuminatis, panicula pauciflora, pedicellis elongatis, corollæ tubo elongato intus villosulo, filamentis anthera sublongioribus medio tubo insertis.

Hab. In ins. Ceylon (*Walker*, *Gardner*, n. 581).—Ejusdem var. *angustifolia*, foliis angustè lanceolatis linearibusve, pedicellis 1–3-nis, dentibus calycinis angustioribus. In ins. Ceylon (*Walker*, *Thwaites*, n. 363, 440 & 457).

Sect. III. Sykesia.—Calyx *Eugærtnereæ*. Corollæ tubus lobis brevior v. vix longior, ad faucem intus villosus.

17. G. paniculata, *Benth.* in Hook. Fl. Nigr. p. 459, foliis (amplis) breviter petiolatis obovali-ellipticis oblongisve breviter acuminatis, vaginis stipulaceis apice aristato-dentiferis, panicula laxa trichotoma, corollæ lobis tubo subbrevioribus, antheris vix exsertis filamento suo longioribus.—Species *G. Kœnigii* arctè affinis. Flores numerosiores, minores, graciliores, calyx minus patens, et stipulæ aristatæ.

Hab. In Africa tropica occidentali ad Grand Bassa (*Vogel*).

18. G. Kœnigii, *Wight*, Ic. t. 1318; Blume, Mus. Bot. p. 174, foliis (amplis) breviter petiolatis obovali-ellipticis oblongisve breviter acuminatis, vaginis stipulaceis integris v. obtusè dentatis, panicula laxè trichotoma, corollæ lobis tubo suo longioribus, antheris exsertis filamentis elongatis.—*Sykesia Kœnigii*, Arn., DC. Prod. vol. ix. p. 35.

Hab. In ins. Ceylon (*Walker, Gardner*, n. 582, &c.).

19. G. acuminata, foliis oblongis acutè acuminatis, vaginis stipulaceis apice subaristato-dentiferis, panicula laxè trichotoma, corollæ lobis tubo subæquilongis, antheris vix exsertis filamento suo longioribus.—Valde affinis *G. Kœnigii* et fortè ejus varietas, folia angustiora longius et acutius acuminata, corollæ minores tubo tenuiore et filamenta multo breviora. Faux corollæ densè villosa.

Hab. In Singapore (*Wall.* Cat. n. 8342), et eadem species? in Borneo (*Lobb*). —An *G. Kœnigii*, *paniculata* et *acuminata* ad unam speciem pertinent ab Africa occidentali usque ad Moluccas diffusam?

20. G. thyrsiflora, *Blume*, Mus. Bot. p. 174, foliis oblongis acutè acuminatis, vaginis stipulaceis 2–4-aristatis, panicula laxè thyrsoidea pauciflora, corollæ tubo laciniis breviore, antheris exsertis, filamentis elongatis.—*Sykesia thyrsiflora*, Arn., DC. Prod. vol. ix. p. 35.—Drupa dipyrena, pyrenis chartaceis, facie plana. Semen semiglobosum, prope basin interiorem affixum. Testa venis ramosis leviter impressa. Albumen cartilagineum. Embryo prope basin albuminis rectum, cylindricum; radicula elongata ad hilum spectans; cotyledones breves conicæ.

Hab. In ins. Ceylon (*Walker*, et forte *Thwaites*, n. 288 sine fl.).

21. G. oxyphylla, foliis oblongo-lanceolatis acutè acuminatis basi longè angustatis, vaginis stipulaceis subbiaristatis, panicula laxa pauciflora, corollæ tubo laciniis subæquilongo, filamentis brevibus (?).—*Psychotria oxyphylla*, Wall. Cat. n. 8374.—Specimina perpauca quæ vidi a *G. acuminata* differre videntur, foliis minoribus multo angustioribus et inflorescentia depauperata. Panicula trifida ramis subpollicaribus, terminali 5–7-floro, lateralibus trifloris.

Hab. In ins. Singapore (*Wallich*).

Since the publication of the first portion of this paper, I have received a detailed memoir on the same subject by M. Louis

Edouard Bureau, entitled "De la Famille des Loganiacées et des plantes qu'elle fournit à la médecine, Thèse pour le Doctorat en médecine." Paris, 1856, 4to, 150 pp. The medical properties of the drugs derived from the family are treated at great length, but there is also considerable space devoted to the systematic questions which are the subject of my own paper. M. Bureau has not had the same advantages as myself in the examination of so large a proportion of specimens, nor does he appear to have had the opportunity of consulting some of the more modern works excepting through Walpers's extracts, such, for instance, as Blume's "Museum Botanicum Lugduno-Batavum," but he has availed himself to the utmost of the materials he has had access to, and his analysis and descriptions are very careful and exact. He inclines to reject a considerable number of genera, referring them to their nearest allied families; that is, *Mitreola*, *Mitrasacme*, and *Polypremum* to *Rubiaceæ*; *Gelsemium* to *Apocyneæ*; *Fagræa*, *Potalia*, and *Anthocleista* to *Gentianeæ*; *Nuxia* and its allies to *Scrophularineæ*. For the reasons above given, I cannot concur in this course, unless indeed the whole order be broken up, and the two genera which M. Bureau considers as essentially typical, *Logania* and *Geniostoma*, be also rejected, the one to *Scrophularineæ*, the other to *Apocyneæ*.

M. Bureau's careful observations of the details of structure of such genera as he had specimens of to dissect, suggest a few additional notes which I shall place in the order above adopted.

Mitreola, Mitrasacme, and Polypremum.

In dissecting the flowers at a very early stage, M. Bureau finds a very perceptible adherence of the ovary to the tube of the calyx, amounting in *Polypremum* to a fifth or nearly a fourth of the total height of the young ovary, and in *Mitreola* to nearly one-half in a very young state, although gradually disappearing as the ovary grows, and imperceptible when the capsule is ripe. This adherence, which some might be disposed to consider as the broad base of the ovary, always large in proportion to its height at an early stage, is, without doubt, indicative of a close affinity to *Rubiaceæ*, an affinity which must suggest itself to any one who studies the *Loganiaceæ*; but appears to me insufficient to establish identity, as it is no more than what is observable in numerous *Scrophularineæ*—in none more so than in *Calceolaria*, which can yet hardly be excluded from true *Scrophularineæ*.

Geniostoma.

M. Bureau points out the curious expansions of the placenta in

which the seeds are imbedded. Most probably in a fresh state they form a pulp filling the whole cavity of the fruit, assuming in desiccation the regular stellately-lobed form, described and figured by M. Bureau.

Labordea.

M. Bureau has been enabled to dissect three flowers of this plant. He confirms the presumed valvular æstivation of the corolla, but finds always two cells only to the ovary, as in the majority of *Loganiaceæ*, and very plausibly suggests that the three-celled one, examined by Gaudichaud, was an accidentally abnormal one. As the fruit is still unknown, there is nothing yet to indicate more exactly its proper place in the order.

Gardneria.

M. Bureau has dissected a flower of *G. ovata*, with ovary-cells and ovules very much larger in proportion to the ovary itself than I had succeeded in finding; possibly those I dissected may have been imperfect by abortion, or M. Bureau's flower may have belonged to the *G. angustifolia*, which is often much like *G. ovata* in foliage. I found the ovary of *G. angustifolia* very much like that figured p. 55 of M. Bureau's paper; but what he designates as a cupuliform arillus, was to my eyes a second ovule, collateral in attachment, but superposed by pressure, and often ripening into a second seed; for the fruit of *G. angustifolia* is more frequently tetraspermous than dispermous.

M. Bureau's woodcuts, comprising dissections of all the genera he has examined, are very accurate and well executed.

I take this opportunity of requesting the correction of two clerical or typographical errors in the first portion of this paper:—

Page 57, line 2 from the bottom, *for* stipules *read* petioles.

— 81, — 25, *for* exact *read* erect.

On some Collections of Arctic Plants, chiefly made by Dr. Lyall, Dr. Anderson, Herr Miertsching, and Mr. Rae, during the Expeditions in search of Sir John Franklin, under Sir John Richardson, Sir Edward Belcher, and Sir Robert M'Clure.

By J. D. Hooker, Esq., M.D., F.R.S., F.L.S., &c.

[Read April 1st, 1856.]

Although the collections made during the later Arctic expeditions contain no novelty, they are, I think, worthy of publication;

both as important materials towards our knowledge of the geographical distribution of plants within the Polar Circle, and as records of the eminent services rendered to this branch of science, by the exertions of the officers of those expeditions, which have contributed so materially to the naval glory of the first half of the nineteenth century.

It is not my intention to do more here than place on record an account of the collections made by Dr. Lyall in Sir E. Belcher's expedition, by Dr. Anderson and Herr Miertsching in Sir R. M'Clure's, and by Mr. Rae after his detachment from Sir John Richardson's party on an exploring expedition from Great Bear Lake to the mouth of the Coppermine River, and to the south shores of Victoria Land. I restrict myself thus, because I hope at some future period to have the honour of laying before this Society a full account of the vegetation of the Polar Circle, embracing the discoveries of all our Arctic voyagers, as well as those of the Scandinavian and Russian naturalists in Greenland, North Europe, and Siberia. This, however, is a work demanding much time and study; my main object in attempting it being to trace the extra Polar distribution of the Polar species, to determine, if possible, the effects of climate upon them during various phases of their development, and to indicate some causes which may have contributed to determine their present distribution.

1. Dr. Lyall's plants, collected during Sir E. Belcher's expedition in 1852–4, in Disco and Whale Fish Islands, and Cape York (coast of Greenland); and in Lancaster Sound, Beechey Island, Wellington Channel, and Northumberland Sound, amongst the Polar islands.

Lat. 68° to 77° N.

Long. 50° to 95° W.

2. Dr. Anderson's and Herr Miertsching's collections from Banks' Land and the adjacent west coast of Prince of Wales Land, and Cape Bathurst, on the mainland to the southward of Banks' Land.

Lat. 70° to 74° N.

Long. 115° to 128° W.

3. Mr. Rae's collections, the chief interest of which is that they connect the latter with the vegetation of the mainland to the south-east, and with the southern shores of Prince Albert's Land, portions of which are called Victoria Land and Wollaston Land.

Lat. 66° to 69° N.

Long. 112° to 117° W.

I cannot dismiss this subject, however briefly introduced, without adverting to the advantage I have derived from the study of Sir John Richardson's admirable Essay on the Geographical Distribution of (American) plants in the country north of the 49th parallel of latitude in his "Arctic Searching Expedition" (ii. 264).

I. Dr. Lyall's Collection.

1. Thalictrum alpinum, *L.*
Hab. Disco.

2. Ranunculus nivalis, *L.*
Hab. Disco, Navy Board Inlet, Pond's Bay, Beechey Island, and Northumberland Sound.

3. Papaver nudicaule, *L.*
Hab. Wellington Channel, &c., abundant.

4. Arabis alpina, *L.*
Hab. Disco.

5. Draba alpina, *Wahl.*
—— *glacialis*, Adams.
—— *algida*, Adams.
Hab. Beechey Island and Wellington Channel.

6. Draba micropetala, *Hook.*
Hab. Wellington Channel.

7. Draba rupestris, *R. Br.*
Hab. Powell Creek and Beechey Island.

8. Cochlearia anglica, *DC.*
Hab. Pond's Bay, Beechey Island, and Wellington Channel.

9. Platypetalum purpurascens, *R. Br.*
Hab. Lancaster Sound.

10. Silene acaulis, *L.*
Hab. Disco.

11. Lychnis apetala, *L.*
Hab. Wellington Channel.

12. Larbræa uliginosa, *Hook.*
Hab. Disco.

13. Stellaria glauca, *L.*
Hab. Disco.

14. Stellaria longipes, *Goldie.*
Hab. Wellington Channel.

15. Arenaria rubra, *L.*
Hab. Disco.

16. Arenaria rubella, *Hook.*
Hab. Beechey Island.

17. Arenaria Rossii, *R. Br.*
Hab. Beechey Island and Northumberland Sound.

18. Honckeneya peploides, *Ehrh.*
Hab. Whale Fish Island.

19. Cerastium alpinum, *L.*
Hab. Whale Fish Island, Disco, and Wellington Channel.

20. Oxytropis campestris, *L.*
Hab. Pond's Bay.

21. Alchemilla vulgaris, *L.*
Hab. Disco.

22. Dryas integrifolia, *Vahl.*
Hab. Beechey Island, Northumberland Sound, and Powell Creek.

23. Dryas octopetala, *L.*
Hab. Wellington Channel.

24. Potentilla crocea, *Salisb.*
Hab. Disco.

25. Potentilla pulchella, *R. Br.*
Hab. Powell Creek, Beechey Island, and Northumberland Sound.

26. Potentilla nivea, *L.*
Hab. Disco.

27. Potentilla pulchella, *R. Br.* ?
Hab. Disco.

28. Epilobium latifolium, *L.*
Hab. Disco.

29. Saxifraga Hirculus, *L.*
Hab. Beechey Island, Wellington Channel, and Northumberland Sound.

30. Saxifraga flagellaris, *Willd.*
Hab. Beechey Island, Wellington Channel, and Northumberland Sound.

31. Saxifraga tricuspidata, *Retz.*
Hab. Pond's Bay and Disco.

32. Saxifraga nivalis, *L.*
Hab. Beechey Island and Wellington Channel.

33. Saxifraga cæspitosa, *L.*
Hab. Whale Fish Island, Powell Creek, Beechey Island, Wellington Channel, and Northumberland Sound.

34. Saxifraga hirta, *Haw.*
Hab. Disco.

35. Saxifraga cernua, *L.*
Hab. Beechey Island, Wellington Channel, and Northumberland Sound.

36. Saxifraga rivularis, *L.*
Hab. Disco.

Saxifraga rivularis, *var.* hyperborea.
Hab. Wellington Channel and Powell Creek.

37. Saxifraga Aizoon, *Jacq.*
Hab. Disco.

38. Saxifraga oppositifolia, *L.*
Hab. Abundant as far North as Northumberland Sound.

39. Chrysosplenium alternifolium, *L.*
Hab. Wellington Channel.

40. Angelica officinalis, *L.*
Hab. Disco.

41. Taraxacum dens-leonis, *Desf.*
Hab. Disco. Wild and introduced forms.

42. Gnaphalium sylvaticum, *L.*
Hab. Disco.

43. Gnaphalium supinum, *L.*
Hab. Disco.

44. Antennaria alpina, *Gærtn.*
Hab. Disco.

45. Erigeron uniflorum, *L.*
Hab. Disco.

46. Campanula linifolia, *A. DC.*
Hab. Disco.

47. Vaccinium uliginosum, *L.*
Hab. Disco and Pond's Bay.

48. Azalea procumbens, *L.*
Hab. Whale Fish Island.

49. Pyrola rotundifolia, *L.*
Hab. Disco and Whale Fish Island.

50. Cassiopea tetragona, *Don.*
Hab. Whale Fish Island, Navy Board Inlet, Pond's Bay, Beechey Island, and Northumberland Sound.

51. Ledum palustre, *L.*
Hab. Whale Fish Island.

52. Phyllodoce taxifolia, *Don.*
Hab. Disco.

53. Pedicularis hirsuta, *L.*
Hab. Disco, Pond's Bay, Beechey Island, and Wellington Channel.

54. Veronica alpina, *L.*
Hab. Disco.

55. Bartsia alpina, *L.*
Hab. Disco.

56. Empetrum nigrum, *L.*
Hab. Whale Fish Island and Disco.

57. Polygonum viviparum, *L.*
Hab. Disco, Powell Creek, Beechey Island, and Wellington Channel.

58. Oxyria reniformis, *L.*
Hab. Disco, Powell Creek, Beechey Island, and Northumberland Sound.

59. Betula nana, *L.*
Hab. Disco.

60. Salix arctica, *R. Br.*
Hab. Disco, Navy Board Inlet, Powell Creek, Beechey Island, and Wellington Channel.

61. Salix polaris, *Wahl.*
Hab. Powell Creek.

62. Peristylus albidus, *Lindl.*
Hab. Disco.

63. Platanthera hyperborea, *Lindl.*
Hab. Disco.

61. Juncus biglumis, *L.*
Hab. Powell Creek and Wellington Channel.

65. Luzula parviflora, *Desv.*
Hab. Disco.

66. Luzula spicata, *Desv.*
Hab. Wellington Channel?*

67. Luzula hyperborea, *R. Br.*
Hab. Disco, Powell Creek, Beechey Island, and Wellington Channel.

68. Luzula campestris, *Desv.*
Hab. Whale Fish Island.

69. Elymus arenarius, *L.*
Hab. Disco.

70. Festuca rubra, *L.*
Hab. Disco and Beechey Island.

71. Festuca brevifolia, *R. Br.*
Hab. Whale Fish Island, Beechey Island, and Wellington Channel.

72. Poa pratensis, *L.*
Hab. Disco.

73. Poa angustata, *R. Br.*
Hab. Powell Creek, Beechey Island, and Wellington Channel.

74. Poa cæsia, *Sm.*
Hab. Beechey Island.

Poa cæsia, *var.* vivipara.
Hab. Beechey Island.

75. Poa laxa, *Hænke.*
Hab. Lancaster Sound.

76. Glyceria arctica, *Hook.*
Hab. Wellington Channel.

77. Pleuropogon Sabinii, *R. Br.*
Hab. Powell Creek.

78. Phippsia algida, *R. Br.*
Hab. Cape York.

79. Dupontia Fischeri, *R. Br.*
Hab. Beechey Island.

80. Hierochloe alpina, *Rœm. & Sch.*
Hab. Beechey Island.

81. Colpodium latifolium, *R. Br.*
Hab. Wellington Channel.

82. Phleum alpinum, *L.*
Hab. Disco.

83. Alopecurus alpinus, *Sm.*
Hab. Cape York, Pond's Bay, Powell Creek, Beechey Island, and Wellington Channel.

84. Trisetum subspicatum, *Beauv.*
Hab. Disco.

85. Eriophorum capitatum, *Host.*
Hab. Whale Fish Island and Powell Creek.

86. Eriophorum polystachyum, *L.*
Hab. Disco, Powell Creek, and Wellington Channel.

87.† Carex festiva, *Dewey.*
Hab. Disco Island.

88. Carex hyperborea, *Drejer.*
Hab. Disco Island, Powell Creek, and Coast of Greenland.

89. Carex rariflora, *Smith.*
Hab. Whale Fish Island.

90. Equisetum arvense, *L.*
Hab. Whale Fish Island and Disco.

91. Equisetum variegatum, *L.*
Hab. Disco.

92. Polystichum Lonchitis, *Presl.*
Hab. Disco.

93. Cystopteris fragilis, *Bernh.*
Hab. Disco.

94. Lycopodium annotinum, *L.*
Hab. Disco.

95. Lycopodium Selago, *L.*
Hab. Whale Fish Island and Disco.

---

* More probably from Disco.
† The Carices were named by Dr. Boott.

Musci.

(Determined by W. Mitten, Esq., A.L.S.)

1. Distichium capillaceum, *B. & S.*
Hab. Beechey Island, between Beechey Island and Northumberland Sound, and Navy Board Inlet.
2. Leptotrichum flexicaule, *Hmpe.*
Hab. Wellington Channel.
3. Dicranum elongatum, *Schleich.*
Hab. Pond's Bay.
4. Dicranum strumiferum, *Ehrh.*
Hab. Arctic Greenland: fertile.
5. Splachnum Wormskioldii, *Hsch.*
Hab. Cape York: fertile.
6. Conostomum boreale, *Sw.*
Hab. Powell Creek, Lancaster Sound.
7. Bartramia fontana, *Schw.*
Hab. Disco Island: fertile.
8. Bartramia ithyphylla, *Brid.*
Hab. Disco Island: fertile.
9. Pottia Heimii, *Fürnr.*
Hab. Beechey Island: fertile.
10. Desmatodon obliquus, *Bruch.*
Hab. Beechey Island: fertile.
11. Trichostomum rigidulum, *Sm.*
Hab. Beechey Island, Navy Board Inlet.
12. Tortula ruralis, *Hedw.*
Hab. Beechey Island, and between there and Northumberland Sound.
13. Tortula leucostoma, *R. Br.*
Hab. Beechey Island: fertile.
14. Encalypta rhabdocarpa, *Schw.*
Hab. Wellington Channel, Beechey Island: fertile.
15. Zygodon Lapponicus, *B. & S.*
Hab. Arctic Greenland: fertile.
16. Grimmia apocarpa, *Hedw.*
Hab. Arctic Greenland, Powell Creek, Lancaster Sound.
17. Racomitrium lanuginosum, *Brid.*
Hab. Whale Fish Island.
18. Mielichhoferia nitida, *Hsch.*
Var. gymnostoma; cætera ut in formâ γ. elongata.
Hab. Wellington Channel and Beechey Island: fertile.
19. Bryum nutans, *Schreb.*
Hab. Whale Fish Island, Cape York, Wellington Channel, Beechey Island, and Pond's Bay: fertile.
20. Bryum albicans, *Wahl.*
Hab. Disco Island.
21. Bryum crudum, *Schreb.*
Hab. Disco Island, Beechey Island.
22. Bryum cernuum, *B. & S.*
Hab. Whale Fish Island, Wellington Channel, Powell Creek, Lancaster Sound: fertile.
23. Bryum bimum, *Schreb.*
Hab. Beechey Island.
24. Bryum calophyllum, *R. Br.*
Hab. Beechey Island: fertile.
25. Bryum pallens, *Sw.*
Hab. Between Beechey Island and Northumberland Sound.
26. Bryum pseudo-triquetrum, *Hedw.*
Hab. Navy Board Inlet.
27. Bryum Ludwigii, *Spreng.*
Hab. Whale Fish Island.
28. Mnium affine, *Bland.*
Hab. Whale Fish Island, Beechey Island, Wellington Channel.
29. Mnium hymenophylloides, *Hüb.*
Hab. Navy Board Inlet.
30. Cinclidium stygium, *Sw.*
Hab. Wellington Channel.
31. Aulacomnion palustre, *Schw.*
Hab. Whale Fish Island.
32. Aulacomnion turgidum, *Schw.*
Hab. Whale Fish Island, Powell Creek, between Beechey Island and Northumberland Sound.
33. Timmia Megapolitana, *Hedw.*
Hab. Wellington Channel.
34. Timmia austriaca, *Hedw.*
Hab. Between Beechey Island and Northumberland Sound.
35. Polytrichum juniperinum, *Hedw.*
Hab. Cape York, Whale Fish Island.

36. Polytrichum formosum, *Hedw.*
Hab. Disco Island.

37. Hypnum julaceum, *Vill.*
Hab. Wellington Channel, Pond's Bay, Navy Board Inlet.

38. Hypnum chryseum, *Schw.*
Hab. Wellington Channel, Beechey Island, Pond's Bay.

39. Hypnum pulchellum, *Dicks.*
Hab. Between Beechey Island and Northumberland Sound.

40. Hypnum splendens, *Hedw.*
Hab. Disco Island.

41. Hypnum rutabulum, *L.*
Hab. Disco Island.

42. Hypnum salebrosum, *Hoffm.*
Hab. Beechey Island, Navy Board Inlet.

43. Hypnum cirrhosum, *Schw.*
Hab. Beechey Island.

44. Hypnum Sprucei, *Bruch.*
Hab. Navy Board Inlet.

45. Hypnum filicinum, *L.*
Hab. Beechey Island.

46. Hypnum stellatum, *Schreb.*
Hab. Wellington Channel, Pond's Bay.

Hypnum stellatum, *var.* foliis basi profundè excavatis.
Hab. Navy Board Inlet.
Differing in appearance from usual states of the species, but, so far as yet observed, without tangible specific character.

47. Hypnum uncinatum, *Hedw.*
Hab. Wellington Channel, Disco Island, Beechey Island, Navy Board Inlet, Arctic Greenland.

48. Hypnum cordifolium, *Hedw.*
Hab. Whale Fish Island.

Hepaticæ.

(Determined by W. MITTEN, Esq., A.L.S.)

1. Jungermannia concinnata, *Lightf.*
Hab. Whale Fish Island.

2. Jungermannia barbata, *Schreb.*
Hab. Disco Island, Pond's Bay.

3. Jungermannia trichophylla, *L.*
Hab. Pond's Bay, Navy Board Inlet.

4. Plagiochila asplenioides, *M. & N.*
Hab. Pond's Bay.

5. Ptilidium ciliare, *Nees ab E.*
Hab. Whale Fish Island. Between Beechey Island and Northumberland Sound.

6. Frullania Tamarisci, *Nees ab E.*
Hab. Navy Board Inlet.

7. Sarcomitrium pingue, (*L.*) *Mitten.*
Hab. Beechey Island.

8. Marchantia polymorpha, *L.*
Hab. Whale Fish Island, Disco Island.

9. Preissia commutata, *Nees ab E.*
Hab. Wellington Channel.

II. DR. ANDERSON'S and HERR MIERTSCHING'S Collections.

1. Anemone Richardsoni, *Hook.*
Hab. Minto Inlet.

2. Ranunculus nivalis, *L.*
Hab. Banks' Land.

3. Ranunculus affinis, *R.Br.*
Hab. Bay of Mercy, Minto Inlet, and Cambridge Gulf.

4. Caltha arctica, *L.*
Hab. Cambridge Gulf and Minto Inlet.

5. Papaver nudicaule, *L.*
Hab. Banks' Land, &c., abundant.

6. Cardamine digitata, *Richards.*
Hab. Banks' Land.

7. Hesperis Hookeri, *Led.*
Hab. Minto Inlet.

8. Parrya arctica, *R.Br.*
Hab. Cambridge Gulf and Minto Inlet.

9. Vesicaria arctica, *Richards.*
Hab. Minto Inlet.

10. Draba alpina, *Wahl.* (*D. glacialis*, Adams, and *algida*, Adams.)
Hab. Banks' Land, &c.

11. Draba hirta, *L.*
Hab. Banks' Land, Albert Sound, Minto Inlet, and Cambridge Gulf.

12. Draba incana, *L.*
Hab. Banks' Land.

13. Draba rupestris, *R.Br.*
Hab. Bay of Mercy, Banks' Land.

14. Cochlearia anglica, *DC.*
Hab. Banks' Land, &c.

15. Platypetalum purpurascens, *R.Br.*
Hab. Minto Inlet.

16. Eutrema Edwardsii, *R.Br.*
Hab. Minto Inlet and Cambridge Gulf.

17. Silene acaulis, *L.*
Hab. Banks' Land and P. Albert's Sound.

18. Lychnis apetala, *L.*
Hab. Baring Land, Cambridge Bay, and Minto Inlet.

19. Stellaria longipes, *Goldie.*
Hab. Banks' Land, &c.

20. Honckeneya peploides, *Ehrh.*
Hab. Banks' Land, Minto Inlet, and Cambridge Gulf.

21. Cerastium alpinum, *L.*
Hab. Banks' Land, Minto Inlet, and Cambridge Gulf.

22. Linum perenne, *L.*
Hab. Minto Inlet.

23. Lupinus perennis, *L.*
Hab. Banks' Land.

21. Hedysarum M'Kenzii, *Richards.*
Hab. Banks' Land, Minto Inlet, and Cambridge Bay.

25. Hedysarum boreale, *Richards.*
Hab. Minto Inlet.

26. Phaca astragalina, *DC.*
Hab. Minto Inlet and Cambridge Gulf.

27. Phaca aboriginorum, *Richards.*
Hab. Banks' Land, Minto Inlet, and Cambridge Gulf.

28. Oxytropis campestris, *L.*
Hab. Banks' Land, Minto Inlet, and Cambridge Bay.

29. Oxytropis Uralensis, *var.* arctica.
Hab. Banks' Land, Cambridge Gulf, and Minto Inlet.

30. Oxytropis nigrescens, *Fisch.*
Hab. Minto Inlet and Cambridge Gulf.

31. Dryas integrifolia, *Vahl.*
Hab. Banks' Land.

32. Potentilla nivea, *L.*
Hab. Banks' Land, Minto Inlet, and Cambridge Gulf.

33. Potentilla nana, *Lehm.*
Hab. Banks' Land.

34. Epilobium latifolium, *L.*
Hab. Minto Inlet and Cambridge Gulf.

35. Epilobium alpinum, *L.*
Hab. Minto Inlet.

36. Hippuris vulgaris, *L.*
Hab. Cambridge Bay.

37. Saxifraga Hirculus, *L.*
Hab. Minto Inlet and Cambridge Bay.

38. Saxifraga aizoides, *L.*
Hab. Minto Inlet.

39. Saxifraga flagellaris, *Willd.*
Hab. Banks' Land.

40. Saxifraga tricuspidata, *Retz.*
Hab. Banks' Land and Minto Inlet.

41. Saxifraga hieraciifolia, *Kit.*
Hab. Cambridge Bay.

42. Saxifraga nivalis, *L.*
Hab. Banks' Land and Cambridge Gulf.

43. Saxifraga cæspitosa, *L.*
Hab. Banks' Land.

44. Saxifraga cernua, *L.*
Hab. Banks' Land, Minto Inlet, Cambridge Gulf, Point Drew, and Point Pitt.

45. Saxifraga oppositifolia, *L.*
Hab. Abundant throughout Banks' Land, &c.

46. Chrysosplenium alternifolium, *L.*
Hab. Cambridge Gulf.

47. Taraxacum dens-leonis, *Desf.*
Hab. Banks' Land, Minto Inlet, and Cambridge Bay.

48. Senecio frigidus, *Less.*
Hab. Banks' Land, Minto Inlet, and Point Bathurst.

49. Senecio palustris, *var.* congestus.
Hab. Banks' Land, Cambridge Gulf, and Minto Inlet.

50. Senecio aureus, *L.*?
Hab. Point Drew, Jones' Island, and Cape Bathurst.

51. Arnica angustifolia, *Vahl.*
Hab. Banks' Land and Minto Inlet.

52. Artemisia vulgaris, *L.*, *var.* Tilesii.
Hab. Point Drew and Cape Bathurst.

53. Artemisia borealis, *Pall.*
Hab. Minto Inlet.

54. Leucanthemum integrifolium, *DC.*
Hab. Minto Inlet and Cambridge Gulf.

55. Leucanthemum arcticum, *DC.*
Hab. Point Maitland.

56. Erigeron ——?
Hab. Banks' Land.

57. Erigeron uniflorum, *L.*
Hab. Banks' Land and Minto Inlet.

58. Nardosmia corymbosa, *Hook.*
Hab. Banks' Land, Point Drew, and Minto Inlet.

59. Campanula linifolia, *A.DC.*
Hab. Minto Inlet.

60. Vaccinium uliginosum, *L.*
Hab. Minto Inlet.

61. Cassiopea tetragona, *Don.*
Hab. Banks' Land and Minto Inlet.

62. Arbutus alpina, *L.*
Hab. Banks' Land, Minto Inlet, Point Drew, Cape Bathurst, and Jones' Island.

63. Polemonium cæruleum, *L.*, *var.* β.
Hab. Banks' Land.

64. Primula Hornemanniana, *Lehm.*
Hab. Banks' Land.

65. Androsace septentrionalis, *L.*
Hab. Minto Inlet and Cambridge Bay.

66. Androsace Chamæjasme, *Wulf.*
Hab. Banks' Land, Cape Bathurst, &c.

67. Phlox Richardsonii, *Hook.*
Hab. Banks' Land.

68. Castilleja pallida, *Spr.*
Hab. Banks' Land, Minto Inlet, and Cambridge Bay.

69. Pedicularis capitata, *Adams.*
Hab. Minto Inlet and Cambridge Bay.

70. Pedicularis Sudetica, *Willd.*
Hab. Minto Inlet, Cambridge Bay, Points Drew, Pitt, Armstrong and Maitland.

71. Pedicularis hirsuta, *L.*
Hab. Banks' Land, Minto Inlet, and Cambridge Bay.

72. Armeria arctica, *Wallr.*
Hab. Minto Inlet and Cambridge Bay.

73. Polygonum viviparum, *L.*
Hab. Banks' Land, Cambridge Gulf, and Minto Inlet.

74. Oxyria reniformis, *Hook.*
Hab. Banks' Land, &c.

75. Salix myrsinites, *L.*
Hab. Prince Albert's Sound.

76. Salix Richardsonii, *Hook.*
Hab. Minto Inlet.

77. Salix myrtilloides, *L.*
Hab. Banks' Land.

78. Salix desertorum ?, *Richards.*
Hab. Minto Inlet.

79. Salix speciosa, *Hook.*
Hab. Banks' Land.

80. Salix polaris, *Wahl.*
Hab. Cape Bathurst.

81. Salix reticulata, *L.*
Hab. Cambridge Bay and Minto Inlet.

82. Triticum repens, *L.*, *var.* purpureum.
Hab. Banks' Land, Points Warren and Pitt.

83. Elymus arenarius, *L.*
Hab. Banks' Land, Minto Inlet, and Point Warren.

84. Festuca brevifolia, *R.Br.*
Hab. Banks' Land, Point Drew, Cape Bathurst, and Jones' Island.

85. Poa laxa, *Hænke.*
Hab. Point Drew.

86. Catabrosa aquatica, *Beauv.*?
Hab. Banks' Land.

87. Glyceria arctica, *Hook.*
Hab. Minto Inlet.

88. Deschampsia cæspitosa, *Beauv.*
Hab. Minto Inlet.

89. Dupontia Fischeri, *R.Br.*
Hab. Points Maitland and Warren.

90. Hierochloe pauciflora, *R.Br.*
Hab. Minto Inlet.

91. Calamagrostis stricta, *Beauv.*
Hab. Point Maitland.

92. Calamagrostis purpurascens, *R. Br.*
Hab. Minto Inlet.

93. Colpodium latifolium, *R.Br.*
Hab. Minto Inlet.

94. Alopecurus alpinus, *Sm.*
Hab. Banks' Land, Cambridge Bay, and Minto Inlet.

95. Eriophorum capitatum, *Host.*
Hab. Banks' Land, Minto Inlet, Point Drew, and Cambridge Bay.

96. Eriophorum vaginatum, *L.*
Hab. Minto Inlet.

97. Eriophorum polystachyum, *L.*
Hab. Banks' Land, Prince Albert's Sound, and Minto Inlet.

98. Carex * scirpoidea, *Mich.*
Hab. Minto Inlet.

99. Carex incurva, *Lightf.*
Hab. Minto Inlet.

100. Carex rigida, *Good.*
Hab. Banks' Land.

101. Carex stans, *Drejer.*
Hab. Minto Inlet.

102. Carex compacta, *R.Br.*
Hab. Minto Inlet.

103. Carex vaginata, *Tausch.*
Hab. Minto Inlet.

104. Carex fuliginosa, *Sternb. & Hoppe.*
Hab. Minto Inlet and Cambridge Bay.

105. Carex ustulata, *Wahl.*
Hab. Cambridge Bay.

106. Elyna spicata, *Schrad.*
Hab. Minto Inlet.

107. Equisetum arvense, *L.*
Hab. Banks' Land and Minto Inlet.

108. Cystopteris fragilis, *Bernh.*
Hab. Minto Inlet.

---

* I owe the names of the Carices to the kindness of Dr Boott.

III. Mr. Rae's Collections.

1. Anemone Richardsonii, *Hook.*
2. Anemone parviflora, *Mich.*
3. Ranunculus Purshii β, *Rich.*
4. Ranunculus hyperboreus, *Rottb.*
5. Caltha arctica, *L.*
6. Draba incana, *L.*
7. Erysimum cheiranthoides, *L.*
8. Oxytropis deflexa, *Dec.*
9. Oxytropis campestris, *Dec.*
10. Oxytropis Uralensis, *DC.*
11. Oxytropis nigrescens, *Fisch.*
12. Phaca astragalina, *DC.*
13. Phaca aboriginorum, *Richards.*
14. Lupinus perennis, *L.*
15. Hedysarum M'Kenzii, *Richards.*
16. Hedysarum boreale, *Nutt.*
17. Sieversia Rossii, *R.Br.*
18. Dryas integrifolia, *Vahl.*
19. Dryas octopetala, *L.*
20. Potentilla biflora, *Willd.*
21. Potentilla fruticosa, *L.*
22. Epilobium latifolium, *L.*
23. Saxifraga Hirculus, *L.*
24. Saxifraga tricuspidata, *Roth.*
25. Saxifraga nivalis, *L.*
26. Saxifraga cæspitosa, *L.*
27. Saxifraga cernua, *L.*
28. Saxifraga rivularis, *L.*
29. Saxifraga oppositifolia, *L.*
30. Taraxacum dens-leonis, *Desf.*
31. Senecio palustris, *var.* congestus, *DC.*
32. Arnica angustifolia, *Vahl.*
33. Antennaria alpina, *Gærtn.*
34. Pyrethrum inodorum, *var.* pumilum, *Smith.*
35. Leucanthemum integrifolium, *DC.*
36. Achillea Millefolium, *L.*
37. Erigeron compositum, *Pursh.*
38. Erigeron uniflorum, *L.*
39. Aster pygmæus, *Torr. & Gray.*
40. Campanula linifolia, *Lam.*
41. Gentiana propinqua, *Richards.*
42. Vaccinium uliginosum, *L.*
43. Cassiopea tetragona, *G.Don.*
44. Ledum palustre, *L.*
45. Rhododendron lapponicum, *Wahl.*
46. Arbutus alpina, *L.*
47. Primula Hornemanniana, *Lehm.*
48. Androsace septentrionalis, *L.*
49. Androsace Chamæjasme, *Wulf.*
50. Phlox Richardsonii, *Hook.*
51. Castilleja pallida, *Spr.*
52. Pedicularis capitata, *Adams.*
53. Pedicularis Sudetica, *Willd.*
54. Pedicularis hirsuta, *L.*
55. Pinguicula vulgaris, *L.*
56. Mertensia maritima, *Roth.*
57. Plantago lanceolata, *L.*
58. Empetrum nigrum, *L.*
59. Armeria arctica, *Wallr.*
60. Polygonum viviparum, *L.*
61. Oxyria reniformis, *Hook.*
62. Salix glauca, *L.*
63. Salix Richardsonii, *Hook.*
64. Salix arctica, *Pall.*
65. Salix reticulata, *L.*
66. Triticum repens, *L.*, *var.* purpureum.
67. Festuca brevifolia, *R.Br.*
68. Poa cæsia, *Smith*?
69. Poa laxa, *Hænke.*
70. Dupontia Fischeri, *R.Br.*
71. Hierochloe alpina, *R. & S.*
72. Calamagrostis Canadensis, *Beauv.*
73. Colpodium latifolium, *R.Br.*
74. Alopecurus alpinus, *Sm.*
75. Trisetum subspicatum, *Beauv.*
76. Eriophorum capitatum, *Host.*
77. Eriophorum polystachyum, *L.*
78. Carex * stans, *Drejer.*
79. Lycopodium Selago, *L.*

* Named by Dr. Boott.

On the Botany of Raoul Island, one of the Kermadec group in the South Pacific Ocean. By J. D. Hooker, Esq., M.D. F.R.S., F.L.S. &c.

[Read April 1st, 1856.]

The materials from which the following sketch is drawn up consist of a small collection of plants made upon Raoul Island, by Mr. M'Gillivray, late Naturalist to H.M.S. *Herald*, under the command of Captain Denham, R.N., who forwarded the collection in question to Sir W. Hooker; and whose zealous exertions in furthering the scientific objects of the expedition under his command demand the grateful acknowledgement of all classes of naturalists.

Very little being known of the Kermadec group, I applied to Captain Washington, R.N., the present able and assiduous Hydrographer to the Admiralty, who promptly forwarded me the following information.

The name of Kermadec Islands was first given, in the chart accompanying Admiral Rossel's account of D'Entrecasteaux's voyage in search of La Peyrouse, to a group situated about 450 miles N.E. of New Zealand, between that group and the Fijis. They consist of four principal islands, Macauley and Curtis Islands, discovered before D'Entrecasteaux's visit, by Lieutenant Watts in the *Penrhyn* in 1788, and Raoul and Esperance Islands, by D'Entrecasteaux on March 15th, 1793.

Raoul, or Sunday Island, is described both by D'Entrecasteaux (vol. i. 295) and D'Urville (Voy. de l'Astrolabe, iii. 7) as triangular, and not more than four leagues in circumference, forming a high, rugged, steep mountain covered with wood. Commodore Wilkes, who afterwards visited it, adds that it appears to be volcanic, and that its rocks rise like basaltic columns.

Captain Denham in H.M.S. *Herald* finished the survey of this island on July 24th, 1854, and reports that "it is in lat. 29° 15′ 30″ S., long. 177° 54′ 52″ W., and that its maximum altitude is 1627 feet." Its only inhabitants consist of a family from New York, to whose humane disposition he is indebted, under the trying circumstances of having to inter his son close to their settlement. Poultry, vegetables and water can be procured there during the summer.

Some further information regarding Raoul Island is given by Mr. Milne (Botanical Collector to the Expedition) in Hooker's 'Journal of Botany' (vii. 151), where the luxuriance of the Cryptogamic vegetation is particularly alluded to, and the pre-

sence of a Palm and some *Orchideæ*, of which, however, no specimens have hitherto been transmitted.

Macauley and Curtis Islands are very much smaller, and L'Esperance is a mere rock.

The most interesting circumstance connected with the vegetation of Raoul Island is the identity of most of the flowering plants, and all but one of the ferns, that have been collected upon it, with those of New Zealand. The great extent of intervening ocean (450 miles), and the small size of the islands, would appear to render it extremely difficult to account for this similarity of vegetation by transport; added to which, the prevailing winds blow from the north-west, and the oceanic currents set in the same direction.

It is also worthy of remark, that of the nine species that are not natives of New Zealand, four are new, and three of these are nearly allied to New Zealand plants; whilst of those five that are not new, three are widely diffused throughout the tropical and subtropical Pacific islands, and would appear not to be capable of enduring the cold of New Zealand; these are the *Metrosideros polymorpha*, *Piper latifolium*, and *Omalanthus nutans*.

The absence of any Ferns (with a single exception) but such as are natives of New Zealand, is, however, a far more striking fact, both because the list is a large one for so small an island (twenty-two species), and because, if their presence is to be accounted for wholly by trans-oceanic transport of these species, the question at once occurs, why has there been no addition of some of the many Fiji or New Caledonian Island ferns, that are common tropical Pacific species, the Fiji Islands being only 700 miles north of the Kermadecs, and New Caledonia 750. The only fern which is not a native of New Zealand, is the Norfolk Island *Asplenium difforme*.

Still more remarkable is the total absence in the collection of any of the plants peculiar to Norfolk Island, for Raoul Island is in the same latitude as Norfolk Island, is exactly the same distance from New Zealand, and the winds and currents set from Norfolk to Raoul Island: in short, though the northern extreme of New Zealand, Norfolk Island and Raoul Island form an equilateral triangle, with the exception of *Asplenium difforme*, there is not a single fern of Norfolk Island found in Raoul Island that is not also found in New Zealand; whilst of the twenty flowering plants of Raoul Island, no less than six are absolutely peculiar to New Zealand and Raoul Island, and with the excep-

tion of the tropical, widely diffused Pacific species, there are no phænogamic plants or ferns confined to Norfolk Island and Raoul Island. It is further remarkable that of the Raoul Island ferns, *Cyathea medullaris* and *Pteris falcata* have not been found in Norfolk Island.

There is no doubt that a complete flora of Raoul Island would modify these results; but there can also be no doubt that it would confirm these indications of its affinities being most strong with that of New Zealand, and feeble to a very unaccountable degree with the floras of those other groups with which it might be expected to possess a very strong relationship.

Of the twenty flowering plants, three are noticed by the collector as being possibly introduced by man, viz. *Sicyos angulatus*, *Gnaphalium luteo-album*, and *Oplismenus æmulus*, all of which were found to affect cultivated ground. These are, however, so widely distributed in the South Pacific Islands, New Zealand, and Australia, that it is quite as probable as not that they are truly wild in the Kermadec group, and only grow in more abundance upon prepared soil. All have, however, appendages that would favour their transport, as the glochidiate setæ of the fruit of the *Sicyos*, the awn of the glume of *Oplismenus*, and the pappus of *Gnaphalium*.

With regard to the remaining seventeen flowering plants, I recognize special adaptations for transport in the following two only:—*Bidens leucantha**, in the barbed setæ of the fruit, and *Lagenophora petiolata*, in the viscid fruit. Of the rest none seem in any way adapted for transport, unless the minute and numerous seeds of the *Lobelia*, *Acianthus*, and *Metrosideros* be so regarded.

Dicotyledones.

1. Coriaria ruscifolia, *L.*
2. Metrosideros polymorpha, *Gaud.*
3. Sicyos angulatus, *L.*
4. Coprosma petiolata, *n. sp.*
5. Coprosma acutifolia, *n. sp.*
6. Panax arboreum, *Forst.*
7. Lagenophora petiolata, *H. f.*
8. Bidens leucantha, *Willd.*
9. Gnaphalium luteo-album, *L.*
10. Scævola gracilis, *n. sp.*
11. Lobelia anceps, *Thunb.*
12. Veronica parviflora, *Vahl.*
13. Myoporum lætum, *Forst.*
14. Omalanthus nutans, *Guill.*
15. Piper latifolium, *Forst.*
16. Peperomia Urvillcana, *A. Rich.*
17. Ascarina lanceolata, *n. sp.*

* This, though not included in the New Zealand flora, has been latterly introduced into the neighbourhood of Auckland, &c.

Monocotyledones.

18. Acianthus Sinclairii, *H. f.*
19. Isolepis nodosa, *R. Br.*
20. Oplismenus æmulus, *R. Br.*

Filices & Lycopodiaceæ.

21. Cyathea medullaris, *Sw.*
22. Hymenophyllum demissum, *Sw.*
23. Adiantum hispidulum, *Sw.*
24. Pteris falcata, *R. Br.*
25. Pteris aquilina, *L.*, *var.* esculenta.
26. Pteris comans, *Forst.*
27. Pteris tremula, *R. Br.*
28. Lomaria procera, *Spr.*
29. Lomaria lanceolata, *Spr.*
30. Doodia caudata, *R. Br.*
31. Asplenium flaccidum, *Forst.*
32. Asplenium difforme, *R. Br.*
33. Asplenium polyodon, *Forst.*
34. Asplenium obtusatum, *Forst.*
35. Asplenium lucidum, *Forst.*
36. Nephrodium decompositum, *R. Br.*
37. Polystichum aristatum, *Presl.*
38. Hypolepis tenuifolia, *Bernh.*
39. Phymatodes Billardieri, *Presl.*
40. Niphobolus rupestris, *Spr.*
41. Psilotum triquetrum, *Sw.*
42. Lycopodium Billardieri, *Spring.*

Descriptions of the New Species.

Coprosma petiolata, *H. fil.*; ramis cylindricis cortice pallido, ramulis petiolisque puberulis, foliis gracilè petiolatis elliptico-oblongis obovatisve obtusis subcoriaceis, stipulis transversè elongatis abruptè longè acuminatis, costis puberulis, floribus capitatis, pedunculis infra v. supra medium bracteolatis, fl. ♂ subsessilibus congestis, calyce brevissimo, corollâ latè campanulatâ profundè 4-fidâ, fl. ♀ 3–5 sessilibus, calycis limbo truncato, corollâ brevi cylindricâ breviter 4-fidâ, stylis crassis erectis.

C. Bauerianæ Ins. Norfolciæ et Nov. Zelandiæ similis, sed folia gracilius petiolata minus carnosa, et marginibus non aut vix recurvis.—Arbor parva, cortice lævi pallido. Folia 1–2 unc. longa, petiolo costâ venisque subtùs puberulis. Pedunculi puberuli, stricti v. curvi, petiolis æquilongi v. iis longiores, interdùm bifoliati. Flores ♂ plurimi, basi involucello brevi suffulti, ¼ unc. longi, alabastra subglobosa. Antheræ breviter oblongæ. Fl. ♀ pauciores, involucello longiore diphyllo suffulti.

Coprosma acutifolia, *H. fil.*; arborescens, ramis cortice lævi pallido tectis, foliis petiolatis membranaceis ovatis elliptico-ovatis ovato-lanceolatisve acuminatis, fl. ♂ ad apices pedunculorum solitariis binis ternisve subsessilibus; pedunculis simplicibus v. dichotomis, calyce minimo 4-lobo, corollâ infundibuliformi ad medium 4-fidâ, staminibus longè exsertis.

C. lucidæ, Forst., affinis, differt præcipuè foliis membrananceis.—Arbor parva, ramosa, cortice lævi pallido, ramulis gracilibus ultimis cylindricis. Folia 2½–2¾ unc. longa, in petiolum ½ unc. longam angustata, penninervia, et reticulatim venosa. Pedunculi petiolis æquilongi v. iis longiores, dum divisi ad axillas stipulis connatis membranaceis instructi. Flores brevissimè pedicellati ½ unc. longi, ♂ tantum visi.

Scævola gracilis, *H. fil.*; procumbens, ramis herbaceis foliisque utrinque pubescenti-pilosis axillis villosis, foliis lanceolatis cuneato-lanceolatisve acutis irregulariter serrato-dentatis in petiolum elongatum angustatis, floribus in ramulis brevissimis axillaribus subsessilibus, foliis 4 lineari-lanceolatis floribus æquilongis bracteatis, calycis tubo brevi basi bracteolato, limbi lobis 5 inæqualibus, 3 subulatis, 2 intermediis brevibus, corollæ lobis angustis.

Calycis villosi tubus basi multibracteatus, sericeus, ¼ unc. longus, lobis valdè inæqualibus, 3 subulatis tubo corollæ ½ brevioribus, 2 intermediis brevibus obtusis lobulatis. Corollæ flavidæ tubus lentè curvus, laciniæ tubo longiores, lineares, ligulatæ, acuminato-uncinatæ, supernè paulò dilatatæ, marginibus membranaceis undulatis, tubo intùs villoso supernè pilis capitatis opacis et secus basin limbi instructo. Stamina subæqualia, tubo corollæ breviora; filamenta filiformia, glaberrima; antheris lincaribus muticis. Stylus pilosus. Stigma hemisphæricum, marginibus cupulæ ciliatis.

Asimina lanceolata, *H. fil.*; arbuscula, foliis coriaceis petiolatis lanceolatis acuminatis grossè serratis subtùs glaucis, paniculis folio brevioribus.

A. lucidæ, H. fil., Novæ-Zelandiæ affinis, sed foliis lanceolatis longioribus et angustioribus, serraturis grossioribus apicibus curvis acutis. Folia 2–3 unc. longa, acuminata, basi in petiolum sensim angustata. Flores subimbricati.

Note on *Obolaria virginica*, L. By Asa Gray, M.D., F.M.L.S. &c.—Extracted from a Letter to George Bentham, Esq., F.L.S. &c.

[Read April 15th, 1856.]

Several years ago, in a memoir* in which *Obolaria virginica* is figured and described, I endeavoured to show that this genus should be referred to the order *Gentianeæ*, *notwithstanding* a peculiarity in its placentation. I wish now to say, that it should be referred there *on account* of its placentation. Had I properly noted at the time what Grisebach states (in his *Gen. et Sp. Gentianearum*), respecting the ovules sometimes occupying several series somewhat remote from the sutures, or had I been led to inspect the ovary of almost any of our common Gentians, the case would have been clear at once. It is only recently that my former pupil, Mr. Henry J. Clark, has called my attention to the fact, hitherto unknown, I believe, that the ovules in most of our Gentians of the United States occupy the whole, or nearly the whole parietes of the ovary; sometimes in nearly definite rows, as in *G. quinqueflora*, but more commonly indefinitely crowded over

* Chloris Bor. Amer. in Mem. Amer. Acad. 1846.

every part except the very sutures, as in *G. Andrewsii*, *G. crinita*, &c. Examining some other genera, we found this to occur also in *Bartonia*, Muhl. (*Centaurella*, Michx.); equally so in both species, *B. tenella* and *B. verna*. In the former species, in which, as in *Obolaria*, four re-entering angles render the cell cruciform, the resemblance to *Obolaria* is striking and complete, as you will see from the enclosed sketch of a transverse section of the ovary of *B. tenella*. The only anomaly of *Obolaria* as a true *Gentianea* which remains, is the imbricative (instead of convolutive) æstivation of its corolla;—of which no parallel instance is known, so far as I am aware. It may however be expected to occur; for useful and reliable as the æstivation of the corolla often is, as an ordinal mark, it is seldom altogether constant.

I think I once mentioned to you an exception of this sort, or rather a variation, which occurs in a family in the arrangement of which you have employed æstivation of the corolla to great advantage, viz. the *Scrophulariaceæ*, in characterizing the *suborders* (as I would suggest they ought not to be called) *Antirrhinideæ* and *Rhinanthideæ*. The same accurate observer, Mr. Clark, long ago showed me that this character occasionally failed in *Mimulus*, especially in *M. ringens* and *M. moschatus*, which almost as frequently present the æstivation of the *Rhinanthideæ* (*i. e.* have some part of the lower lip exterior) as that of the *Antirrhinideæ*, to which the genus belongs. Last summer I noticed a second exception of the kind in a *Pentstemon* (*P. heterandrum*, Torr. & Gray, in Beckwith's Report of a Pacific Railroad Survey), which besides the anomaly of having the fifth stamen sometimes antheriferous and sometimes sterile, had also, in about half of the flowers examined, the lateral lobes of the corolla external in the bud, and covering the two posterior lobes as well as the anterior one.

On the Action of Sea-water on the Germination of Seeds. By CHARLES DARWIN, Esq., Vice-Pres. R.S., F.L.S. &c.

[Read May 6th, 1856.]

DURING the spring of last year it occurred to me that it would be worth while, in relation to the distribution of plants, to test how long seeds could endure immersion in sea-water, and yet retain their vitality. As far as I knew, this had not been tried by bota-

nists, who would have been far more capable of doing it efficiently than myself; and I now find that M. Alph. DeCandolle, in his admirable work, "Géographie Botanique," regrets that such experiments have not been tried; I think, that had he known even the few facts here to be recorded, some of his opinions on the means of distribution of particular families would have been slightly modified. The Rev. M. J. Berkeley has likewise tested fifty-three different kinds of seeds, and has published a report in the "Gardener's Chronicle*," to which periodical I have also sent two brief notices on the same subject†. I intend here to give, with Mr. Berkeley's kind permission, an account of our joint experiments. I may premise, that not knowing, at first, whether the seeds would endure even a week's immersion, I selected a few by simple chance, taking, however, the seeds of different families; subsequently I have been aided by suggestions from Dr. Hooker.

I must briefly describe how my experiments were tried: the seeds were placed in small bottles, each holding two or three ounces of salt water, carefully made according to Schweitzer's analysis: as both *algæ* and marine animals have, as is well known, long survived in water thus made, there can be no doubt that the experiment was thus fairly tried. Mr. Berkeley sent his seeds to Ramsgate, tied up in little bags and placed in the sea-water, daily renewed; and they were thus immersed for three weeks, and when partially dried, but still damp, were sent off, but by accident were not unpacked for four days subsequently, so that their total immersion "was equivalent to one of more than a month." Some of my bottles were put out of doors in the shade, and were exposed to an average weekly temperature of from 35° to 57°; the other bottles were kept in my cellar, and were exposed to much less variation of temperature, viz. to a daily mean average of from 46° to 56°. Further, to test the effect of temperature, I immersed eighteen different sorts of seeds in salt water, in a tank, which, from containing much snow, was for six weeks at the temperature of 32°, slowly rising for the next six weeks to 44°; but the seeds thus tested did not seem to withstand the injurious effect of the salt water better than those exposed to a higher but variable temperature. I may remark, that amongst the eighteen kinds of seeds immersed in the cold salt water, there were seeds of a somewhat tender constitution, as capsicum and vegetable marrow, but the exposure to the cold in no degree injured their germination. In the case of some of the seeds which I first tried,

* Sept. 1st, 1855. † May 26th and Nov. 24th, 1855.

and which were put out of doors, I did not change the salt water for fifty-six days, and it became putrid and smelt offensively to a quite surprising degree, especially the water with the cabbage, radish, cress and onion seed, which also gave out strongly the odour of each kind; so that I thought the putridity would infallibly have been communicated to the seeds; but judging from the seeds of some of the same plants (but not actually from the same lot of seed) placed in salt water often renewed, and likewise kept in the cellar under a less variable temperature, neither the putridity of the water nor the changing temperature had any marked effect on their vitality. Cress seed (*Lepidium sativum*) and that of *Phalaris Canariensis*, after twenty-two days' immersion, were thoroughly dried for a week and then planted; they germinated pretty well, but the seeds themselves of this particular lot were not very good. At first I tried the seeds after each successive week's immersion, and they germinated at the same period as did seeds of the same kind which had not been salted; celery and rhubarb seed, however, were somewhat accelerated in their germination. Some kinds of seeds, as of *Trifolium incarnatum*, *Sinapis nigra*, peas, kidney and common beans, swelled much in the salt water, and they generally were killed by a short immersion; but the swollen seeds of *Lupinus polyphyllus* germinated better than those which did not swell. I was surprised to observe that most of the seeds of *Convolvulus tricolor* germinated after seven days under the salt water and lived for some time in it; as did likewise the fresh seed of *Tussilago farfara* after 9 days; after 25 days I took out some of the young plants of the *Tussilago* and planted them, and one of them grew: some of the seeds of the garden orache (*Atriplex*) also germinated under water after 56 days' immersion, but I failed in raising the seedlings; the other seeds of the same lot of the orache germinated excellently after 100 days' immersion.

The total number of seeds tried by Mr. Berkeley and myself amount only to 87, for unfortunately we happened to select some of the same kinds; in one respect, however, this has been fortunate, for we have thus tested each other's results, and they accord perfectly as far as they go; the seed of the tomato, however, germinated better after a month's immersion with Mr. Berkeley than after only 22 days with me; but my seed appeared to be old. And this leads me to remark, that I suspect that fresh seed withstands the salt water better than old, but yet good seed; this was the case with *Trifolium incarnatum*, *Phlox Drummondii*,

and I believe with *Sinapis nigra*. Of the genus *Godetia*, Mr. Berkeley found one species was killed by, and another survived, a month's immersion: but a far more curious case is presented by the varieties of the cabbage; for I found that good seed of the "Mammoth white broccoli" germinated after 11 days' immersion, but was killed by 22 days; seed of the "early cauliflower" survived 22 days, but was killed by 36 days; "Cattell's cabbage" germinated excellently after 36 days, but was killed by 50 days; and lastly, fresh seed of the wild cabbage from Tenby germinated excellently after 50 days, very well after 110 days, and two seeds out of some hundreds germinated after 133 days' immersion.

Of the 87 kinds of seeds tried, 23 or more than one quarter did not endure 28 days' immersion: capsicum has endured the trial best, for 30 out of 56 seeds germinated well after 137 days' immersion: of celery seed after the same period of 137 days, only 6 out of several hundreds germinated. The worst germinators have been dwarf kidney beans and *Hibiscus manihot*, both killed by 11 days' immersion; common peas were killed by 14 days'; *Tussilago farfara* germinated under water after 9 days, but the young plants kept alive for some time: the next worse germinators have been *Phlox Drummondii*, *Trifolium incarnatum*, *Linum usitatissimum*, and *Sinapis nigra*, very few of which survived 15 days' immersion.

From such scanty materials it is, perhaps, rash to draw any sort of deduction in regard to the power of resistance to salt water in the different divisions of the vegetable kingdom; but a few remarks may be permitted. Three out of the 17 Endogens and 20 out of the 70 Exogens were killed by a month or 28 days' immersion: this fact, together with the marked power of endurance in the *Atriplex*, *Beta*, *Spinacea*, and *Rheum*, lowly organized exogens, accords with, and is perhaps connected with, the fact, insisted on so much by M. A. DeCandolle, of the wider range of the Endogens and of the lowly organized Exogens, than of the higher Exogens*. The four *Solanaceæ* and two *Umbelliferæ* endured the salt water very well, and each included the longest survivor of all the species tried. Ten *Compositæ* were tried, and only one was killed by a month's immersion, that is excepting the *Tussilago* which germinated under water. Eight *Cruciferæ* were tried, and all withstood the influence well, excepting *Sinapis nigra*, which

* Godron in his "Florula Juvenalis," p. 16, states that the seeds of some plants, as of *Atriplex* and certain *Gramineæ*, germinate perfectly in salt-marshes, where they have been immersed during all the winter under salt water.

was killed by 25 days' immersion; three of the *Cruciferæ* survived 85 days: this power of endurance in the seeds of this family is, perhaps, surprising, considering the oil in their seeds. Nine *Leguminosæ* were tried; these all resisted the salt water badly, with the exception of the hard thin seeds of *Mimosa sensitiva*, which germinated pretty well after 50 days; three species of Lupine seemed just able occasionally to withstand about 36 days' immersion; the seeds of the other *Leguminosæ* having all been killed by much shorter periods. I suspect that it is the water, and not the salt, which kills the *Leguminosæ*; at least I found that a lot of fresh "Thurston Reliance" peas were all killed by 13 days' immersion in pure water*; and I have been assured that a much shorter immersion will kill kidney beans. Lastly, seven species of the allied families of *Hydrophyllaceæ* and *Polemoniaceæ* (six having been selected by Mr. Berkeley) were killed by a month's immersion, and so great a proportion can hardly be accidental.

From the great difference in the powers of resistance to the sea-water in the different families just specified, and even in the varieties of the same species; and from the *Leguminosæ* being apparently in this respect the tenderest, whereas they are generally believed to keep longer than any other seeds in a dry state, I think we may learn a lesson of caution, not to infer with too much certainty which seeds will endure longest when naturally buried in damp earth, from knowing what kinds will keep best in an artificial state.

I had intended trying many more seeds, as I at one time thought that these experiments would have thrown more light on the dispersal of plants than I now think they do. I soon became aware that most seeds, in accordance with the common experience of gardeners, sink in water; at least I have found this to be the case, after a few days, with the 51 kinds of seeds which I have myself tried; so that such seeds could not possibly be transported by sea-currents beyond a very short distance. Some few seeds, however, do float, as I have tried with some of those cast by the Gulf Stream on the coast of Norway. From knowing that timber is often cast on the shores of oceanic islands far from the mainland, and from having met with accounts of floating vege-

*'Loiseleur-Deslongchamps says (Consid. sur les Céréales, Part ii. p. 234) that in wheat put into water the embryo comes out in the course of two days; as Mr. Berkeley's wheat survived after 30 days' immersion in sea-water, one may suspect that in this case, the seed would survive longer under sea-water than under fresh water.

table rubbish off estuaries, I assumed that plants, with ripe seeds, washed into the sea by rivers, landslips, &c., might be drifted by sea-currents during a period of some weeks. The closing of the capsules, pods, and heads of the *Compositæ*, &c., when wetted, and their re-opening when cast on shore and dried, the seeds being thus allowed to be driven inland by the first stormy winds, seemed to favour such means of transport. But in putting 34 plants of different orders, with ripe fruit, into salt water, one alone, the *Euonymus*, floated for a month, being buoyed up by its fruit; the others all sunk in 21 days, some in 5, and several in 7, 9, and 11 days. But I am not sure that I have made the trial fairly, for I kept the floating plants in too warm and dark a place, which might have favoured their decay. Finally I may remark, that the seeds of very few species are, as far as we yet know, all killed by 10 days' immersion,—that some plants will float for this period,—that the average rate of the ten currents in the Atlantic Ocean, given in Johnston's "Physical Atlas," is 33 miles per diem (the main Equatorial current running at the rate of 60 miles, and the Cape Stream at 80 miles per diem); and therefore I conclude, under the existing extremely scanty materials for forming any opinion, that some plants might under favourable conditions be transported over arms of the sea 300 or even more miles in breadth; and if cast on the shore of an island not well stocked with species, might become naturalized.

In the following list, to save repetition, I have marked the plants tried by Mr. Berkeley, and which germinated after a month's immersion, with †; when they did not germinate, this is expressly stated. The "cold water" refers to the seeds placed in salt water in the tank with snow.

I have arranged the families in accordance with Lindley's "Vegetable Kingdom."

ENDOGENS.

(Gramineæ.)

Avena (common oats): after 85 days' immersion germinated excellently; after 100 days some germinated; after 120 days some half-germinated.

Hordeum (common barley): germinated well after 28 days, but none after 42 days; in the cold water well after 30 days (†).

†*Triticum* (wheat).

Phalaris Canariensis: after 70 days nearly all germinated; in

another lot after 85, most of the seeds germinated, but the seedlings died off; after 100 and likewise after 120 days' immersion, in each case, a single seedling came up.

Holcus saccharatus: after 36 days germinated fairly; after 50 days all died.

†*Zea Mays*: none germinated after a month's immersion.

†*Arum maculatum.*

†*Anomatheca cruenta.*

†*Babiana plicata.*

†*Trichonema pudicum.*

†*Sisyrinchium iridifolium.*

Canna Indica: after 50 days several germinated, but not very strongly.

†*Colchicum autumnale*: did not germinate.

Allium cepa: after 56 days' immersion, 3 out of 15 germinated; after 82 days in the cold water, most of the seeds grew well; after 100 days, 2 or 3 grew out of about 25 planted (†).

†*Bulbine annua.*

†*Asphodelus luteus.*

†*Uropetalum serotinum*: did not germinate.

EXOGENS.

Ricinus communis (*var. major* and *minor*): both germinated after 36 days.

Cucurbita Melopepo (vegetable marrow): germinated after 100 days; of 4 seeds immersed in the cold water for 82 days, 2 germinated.

†*Cucumis Melo* (melon).

Cistus (mixed shrubby garden varieties): germinated well after 36 days, and some germinated after 70 days.

(CRUCIFERÆ.)

Lepidium sativum: after 85 days' immersion only one out of many germinated; after 56 days $\frac{6}{57}$ grew: in the cold water, after 65 days, $\frac{4}{60}$ grew. (†*var.*, golden cress.) These seeds gave out an astonishing quantity of slime in the salt water.

Brassica oleracea, var. "Mammoth white Broccoli:" germinated after 11 days' immersion, but after 22 days all died.

——— ———, *var.* "Early Cauliflower:" after 22 days, 5 out of 100 germinated; after 36 days all dead.

Brassica oleracea, var. "Cattell's Cabbage:" germinated excellently after 36 days; all dead after 50 days.

———— ————, *var.* growing wild on the Castle Rocks of Tenby; fresh seeds, after 50 days germinated excellently; after 110 days germinated very well; after 133 days only two out of some hundreds germinated (†).

†*Brassica Rapa* (*var.* yellow turnip).

Raphanus sativus: after 85 days, $\frac{2}{3}$ germinated; the cold water seemed to be injurious to these seeds, for after only 30 or 50 days all the seeds were dead (*var.* black radish) (†).

Erysimum Perowskianum: after 36 days germinated well; after 50 only one seed; after 70 days all dead (†).

Matthiola annua: germinated after 28 days; all dead after 54 days.

Sinapis nigra: seeds much swollen; germinated after 11 days; all dead after 22 days: *fresh* seed germinated pretty well after 15 days, but were all killed by 25 days' immersion.

Crambe maritima: after 37 days germinated well.

Tropæolum majus: after 37 days nearly all germinated, but after 50 days none did.

†*Limnanthes Douglasii.*

Hibiscus Manihot: all were killed by 11 days' immersion (†).

†*Malope grandiflora.*

Papaver somniferum: germinated well after 28 days; was killed by 54 days.

Argemone Mexicana: came up excellently after 50 days, and pretty well after 70 days.

†*Chryseis crocea* (germinated very imperfectly after the month).

Linum usitatissimum: after 7 and after 14 days only two or three seeds, out of very many, germinated; after 28 only one seed came up; after 42 days not one germinated. These seeds gave out much slime.

†*Silene compacta.*

Rheum Rhaponticum: germinated well after 82 days.

Atriplex (garden orache): some of the seed germinated under water after 56 days' immersion; the remaining seed germinated excellently after 100 days.

Beta vulgaris: excellently after 100 days (†).

Spinacea oleracea: excellently after 70 days; a few after 120 days; all killed by 137 days (†).

(LEGUMINOSÆ.)

Vicia Faba (*var.* "Johnston's Wonder"): two out of six lived

after 11 days' immersion; one half-germinated after 14 days; after 22 days all dead: many of these beans swelled greatly. I tried sixty after 28 days and found all dead. None survived 30 days in the cold water.

Pisum sativum: after 11 days some germinated; none survived 14 days; none survived 30 days in the cold water. Another lot of *fresh* seed ("Thurston's Reliance") all died after 12 days; none survived 30 days in the cold water. I found 13 days' immersion in pure water killed these latter fresh peas. (†None germinated.)

Phaseolus vulgaris (*var.* "early frame dwarf"): all died after 11 days' immersion; after 28 days' immersion, 80 were planted, but all dead. I tried another lot of *fresh* seed, but none of them resisted even 10 days' immersion; nor did they resist 30 days in the cold water: many of these seeds swelled much (†).

Trifolium incarnatum: all died after 11 days' immersion, and after 30 in the cold water. *Fresh* seed germinated excellently after 5 days' immersion, well after 12 days, and one single seed out of some hundreds germinated after 20 days. These seeds swelled much.

Ulex europæus: after 11 days germinated well; after 14 days two germinated; after 28 days all dead.

Lupinus polyphyllus: after 22 days, out of seven swollen seeds three germinated; seven others did not swell and were all dead; after 36 days' immersion one began to germinate and then died.

Lupinus luteus (pale *var.*): after 22 days $\frac{4}{12}$ lived; after 36 days' immersion $\frac{3}{18}$ germinated; after 50 days all dead.

†*Lupinus pubescens* germinated after a month, but Mr. Berkeley says the greater number were rotten.

Mimosa sensitiva: germinated excellently after 36 days' immersion, and pretty well after 50 days.

Geum coccineum (*var. splendens*): after 36 days germinated well, and after 70 days one single seed germinated.

Saxifraga incurvifolia: did not germinate after 30 days' immersion.

——— *aizoides*, nor did this species, but the seed was not very good.

(SOLANACEÆ.)

Capsicum annuum: after 137 days' immersion, 30, out of 56 planted, germinated well (†).

Solanum tuberosum: germinated excellently after 70 days, well after 100; all dead after 120 days.

——— *lycopersicum* (common tomato): one seed germinated after 22 days' immersion, the rest were killed by 36 and 50 days' immersion. († But Mr. Berkeley found that they germinated after a month.)

†——— *melongena*.

Convolvulus tricolor: after having been 7 days in the salt water, many of the seeds germinated, and the embryos came out of the husks: of those which did not germinate under water, one germinated after 36 days' immersion.

(Polemoniaceæ and Hydrophyllaceæ.)

Gilia tricolor († was killed by a month's immersion).

Phlox Drummondii: of old seed none germinated after 11 days; but of fresh seed, 3 out of many germinated after 15 days, and none after 25 days' immersion.

Eutoca viscida.
Nemophila insignis.
——— *atomaria*.
——— *maculata*.
——— *discoidalis*.
} † None of these were found by Mr. Berkeley to germinate after a month's immersion.

Borago officinalis: a few came up after 14 days' immersion, one after 28 days, and none after 42 days.

†*Nolana grandiflora*.

Satureja (common savory): after 42 days, 3 seeds out of many germinated.

Campanula Pentagonia († did not germinate after a month's immersion).

†*Fedia graciliflora*.

†*Fedia* (corn salad).

(Compositæ.)

Lactuca sativa (common lettuce): after 56 days' immersion $\frac{1}{10}$ of the seed came up; after 85 days only one out of several germinated. Cold water had no marked effect, but after 65 days they germinated rather better than the others (†).

†*Cichorium Endivia*.

Galinsoga trilobata: germinated after 22 days.

Aster Chinensis (mixed German varieties): germinated after 28 days; all dead after 54 days' immersion.

Ageratum Mexicanum: after 100 days, one seed out of many germinated; at much shorter periods these seeds did not germinate well.

Leontodon Taraxacum: germinated excellently after 61 days' immersion; the seeds were fresh.

Tussilago Farfara: fresh seeds being placed in the salt water, after 9 days, many of them germinated under water. After 25 days, I took out some of the young plants and planted them: one grew. The germination of these seeds is the more remarkable, as this is not a sea-side plant.

†*Monolopia Californica.*

†*Cenia turbinata.*

†*Cosmos luteus*: did not germinate after a month's immersion.

Clarkia pulchella: germinated well after 28 days; was killed by 54 days' immersion.

†*Godetia rubicunda.*

†——— *Lindleyana* was killed by a month's immersion.

Apium graveolens (*var.* "Cattell's white"): after 137 days only 6 seeds out of some hundreds germinated; after 85 days the seeds germinated excellently; they did not appear to germinate quite so well after 82 days in the cold water (†).

Daucus carota: a very few germinated after 85 days; after only 56 days $\frac{3}{30}$ grew (†).

On the Vitality of Seeds after prolonged Submersion in the Sea.

By James Salter, Esq., M.D., F.L.S. &c.

[Read May 6th, 1856.]

I should not have thought the observations which are the subject of this little communication of sufficient importance to occupy the attention of the Linnean Society, had it not come to my knowledge that one of our most distinguished British naturalists is at present engaged in investigating experimentally the question of the vitality of seeds after prolonged submersion in sea-water, especially in reference to the influence which that circumstance would have in explaining some of the problems of geographical vegetable distribution.

The facts which I am about to detail, and which came accidentally under my notice some years since, bear directly upon this subject, and while, as it seems to me, they establish the doctrine

that certain seeds *do* retain their vitality after submersion in the sea, probably for a considerable period, they suggest also, as far as these instances themselves are concerned, an explanation of the mode in which the seeds may have passed from one locality to another. The facts to which I refer are briefly these:—

In the year 1843, the authorities of Poole in Dorsetshire determined to deepen the channels of Poole Harbour to facilitate navigation. For this purpose a large number of ballast-lighter-barges were employed to scrape the mud from the bottom of the channels and convey it to the shore, where it was deposited in large quantities. During the winter sufficient mud was thus obtained to cover an area of some hundred square yards several feet in thickness, and this was accumulated to such an extent, that a quay was made of the hardened mud on the edge of the shore.

The quay however was never used, nor its surface disturbed.

Early in the following spring I was surprised to see that the surface of this harbour-mud exhibited abundant vegetation, of a character totally distinct from that of the neighbouring shore; and as the season advanced, and the species were recognized, the flora of this mud quay was not only found totally distinct from the littoral vegetation which surrounded it, but it contained plants which did not grow within many miles of the spot, and one which was probably foreign to the county. Immediately surrounding the mud quay was the ordinary vegetation of our southern harbour shores, *Statice*, *Salicornia*, *Atriplex*, *Carices*, &c., whilst on this exposed mud itself not one of them was to be seen; but instead of these there sprung up a large crop of oats and barley, some plants of *Lysimachia vulgaris*, one plant of *Centaurea calcitrapa*, and multitudes of *Epilobium hirsutum*; and besides these there were other plants which I did not recognize, or whose names I have forgotten.

To my mind it appeared conclusive, that the seeds which produced this crop of vegetation must have been in the mud at the time it was deposited on the shore by the lighters.

Taking the plants I have named as constituting part of the vegetation of this new-made land,—they none of them grew in its neighbourhood. The cereals, which constituted the most numerous of the plants, were not cultivated within a mile of the spot. This mud quay was made at the extremity of the peninsula upon which the town of Poole is built, and the nearest field upon which cereals are cultivated is on the other side of the town, and at least a mile from the shore.

Lysimachia vulgaris does not grow within four or six miles of the spot; *Epilobium hirsutum* two or three miles; and *Centaurea calcitrapa* is scarcely known in the county, and certainly not within ten miles of Poole.

Now remembering that none of these plants grew either on the shore around the spot, nor even within miles distant; remembering too that they were the sole occupants of this new-made land, and that the ordinary shore plants, growing in abundance only a few feet from its edges, were not to be seen on it, and further, that this abnormal vegetation showed itself the very next spring, even only a few weeks after it was completed, it must, I think, be conceded, that the seeds were in the mud at the time it was spread upon the shore; and that idea is still further sustained because a very possible explanation suggests itself, which would sufficiently account for the presence of the seeds of the plants named, in the situation from which the mud was obtained. The mud was collected in the main channel about midway between the head and the mouth of the harbour. At the head of the harbour two rivers pour their waters into it, the river Frome and the river Piddle. These rivers take their origin in the western parts of the county of Dorset, and in their course pass through districts having every variety of soil and capable of furnishing vegetation of great diversity; on their banks, moreover, two of the species I have mentioned (*Lysimachia* and *Epilobium*) grow in profusion.

Is it too much to suppose that the seeds from which these plants sprung had fallen into the rivers in various parts of their course, had gone with their waters into the harbour, and ultimately reached the position from which the mud and they had been collected? That explanation appears to me to be very probably correct; but whether it be received or not, the more important point,—that a variety of seeds had been for a period, probably considerable, at the bottom of Poole Harbour, soaking in water as salt as that of the ocean, had retained their vitality till brought under the influence of air and rain and warmth, and had then produced healthy vegetation—that is a point which I think cannot be disputed.

Note on the Development of Fungi upon Patna Opium. By the Rev. M. J. Berkeley, M.A., F.L.S. &c.

[Read June 3rd, 1856.]

Corda has figured in his fifth Fasciculus a species of *Periconia*, which was observed by Jänner on Opium from which the *Morphine* had been extracted. This, as far as I know, is the only recorded instance of vegetation on that substance, though there would be no reason for surprise, when moulds are developed so largely in mineral poisons, if they should not be incapable of growth in vegetable poisons. The stems and capsules of *Papaver somniferum* nourish more than one parasite; but it is probable, that in the condition in which they are when the fungi make their appearance, they contain very little opium.

Specimens of the shell of opium cakes, consisting of the petals of *Papaver somniferum*, agglutinated with an impure opium paste known under the name of Lewah, have just been transmitted to me by Dr. Thomson, to whom they had been communicated by Dr. Mackinnon from Patna, in consequence of an affection to which the opium cakes have been subject for the last year or more. One specimen consists of shell from a very perfect cake, the other from a cake in an advanced state of decay. On examination of the lewah between the layers of petals, with sesquichloride of iron, there was little or no red tint in either. Both so far seemed to be in the same condition. On examination with the microscope, the shell from the perfect cake exhibited a large quantity of pollen-grains attached to the surface, and abundant mycelium of *Penicillium*, with necklaces of spores of various sizes, but without any symptoms of consequent decay. The shell from the unsound cake was much decomposed. It was infested with *Acari*, whose eggs and dung were scattered about, mixed with a few pollen-grains. There were abundant traces of the same *Penicillium*, but not in so perfect a condition. There seemed also to be a mixture of the spores of *Aspergillus*, with copious sporangia of *Eurotium Herbariorum*, which is now recognized as a form of the fruit of that genus; besides which, there were little heaps of white matter, consisting of minute bodies endowed with Brownian motion, and numberless infant spores of some mould in various conditions, resembling the Yeast fungus, and possibly an early stage of the *Penicillium* or *Aspergillus*. In the former case mould was present, but not in such abundance as to do mischief; in the latter mould predominated, and was, I believe, the cause of the dete-

rioration of the opium. Without more ample materials, it would be imprudent to conclude that the little mould in the first instance had robbed the lewah of its meconic acid, though it had done no damage to the mass of opium within, nor have I any specimen of the damaged opium itself for comparison.

Supposing however, which is very probable, that the injury to the opium has really arisen from the mould, the question is, how may it be remedied, and so remedied as not to impair the sample? It is obvious that dipping the cakes into any solution would be liable to objection, as probably leading to mischief. If, however, the cakes, as soon as any mould appears, were submitted to sulphurous acid (the vapour of common sulphur), I am inclined to think that the remedy would be complete, and that the cakes would not be injured in appearance. If the affection should become of any serious importance, the practice would be well worth trial, and I should be very sanguine of its success.

M. J. Berkeley.

King's Cliffe, April 26, 1856.

Supplemental Observations, in a Letter to J. D. Hooker, Esq., M.D., F.R.S., F.L.S. &c.

King's Cliffe, April 28, 1856.

My dear Friend,—I have made another chemical examination of the two specimens of Opium shell this morning, the result of which is as follows:—

Neither in the bad nor good the lewah in solution with water and alcohol gave any red tint with litmus paper. There is, therefore, no free meconic acid.

1. Sesquioxide of iron in a spirituous solution of the lewah gave no red tint in either. It should seem then, again, that there is no meconic acid. As, however, the solution was slightly discoloured with gallate of iron, the matter is not decisive. Meconate of iron may not have been formed, in consequence of the formation of gallate of iron.

2. Strong nitric acid gave a *slight* red tinge to a spirituous solution in both cases: there is, therefore, a small quantity of morphia in both.

We made a comparative trial with opium powder in the first instance (No. 1), and at once obtained a *strong* red tint even with an aqueous solution. Our examination, therefore, is to a certain degree worth attention.

NOTICE.

It is proposed to issue four numbers annually, as nearly as possible at definite intervals, containing Papers on Natural History read before the Society, and not inserted in its "Transactions." The Zoological and Botanical Papers will be separately paged, so that either section may be taken separately.

The "Journal of the Proceedings" for the present year will be sold to the Public at 12*s*. for the entire Journal, or 8*s*. for either the Zoological or Botanical section taken separately; the separate numbers being charged 3*s*. for the whole, or 2*s*. for either section.

The "Journal of the Proceedings" is sent free of charge to Fellows of the Society.

Vol. XXII. Part 1. of the "Transactions" will be published early in November.