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THE
MISCELLANEOUS
BOTANICAL WORKS

OF

ROBERT BROWN, ESQ., D.C.L., F.R.S.,

FOREIGN ASSOCIATE OF THE ACADEMY OF SCIENCES OF THE
INSTITUTE OF FRANCE, ETC., ETC., ETC.

VOL. I.

CONTAINING

I. GEOGRAPHICO-BOTANICAL,

AND

II. STRUCTURAL AND PHYSIOLOGICAL MEMOIRS.

LONDON:

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P R E F A C E.

(BY THE EDITOR.)

THE present volume contains the first portion of the works of the distinguished author, now for the first time collected in England, and reprinted from the originals, without change, in accordance with his express desire. It had been his intention to reprint them himself with annotations, but, unfortunately for science, this intention was never carried out, and it remained for the Editor simply to superintend a verbatim reprint.

The Memoirs are arranged in three divisions—1st. Geographico-Botanical; 2nd. Structural and Physiological; 3rd. Systematic. Of course this arrangement is in some degree arbitrary, inasmuch as observations relating to both of the other divisions are continually occurring in the Memoirs referred to each of them; but, on the whole, it has appeared to be the most convenient for reference. The present volume contains the first two of these divisions; the second will be devoted to Systematic Memoirs and Miscellaneous Descriptions of Plants; and a separate volume, in large 4to, will contain the illustrative figures to both.

JOHN J. BENNETT.

DECEMBER 30TH, 1865.

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P A R T I.

GEOGRAPHICO-BOTANICAL MEMOIRS.

GENERAL REMARKS,

GEOGRAPHICAL AND SYSTEMATICAL,

ON THE

BOTANY OF TERRA AUSTRALIS.

BY

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NATURALIST TO THE VOYAGE OF H.M.S. INVESTIGATOR, COMMANDED BY
CAPTAIN FLINDERS.

[Reprinted from a Voyage to Terra Australis, by Matthew Flinders.]

LONDON.

—
1814.

GENERAL REMARKS, &c.

THE coasts of the great South Land commonly [533*] called New Holland have been discovered partly by Dutch and partly by English navigators. Captain Flinders, considering it therefore unjust towards the English to retain a name for the whole country which implies its discovery to have been made by the Dutch alone, has thought proper to recur to its original name Terra Australis; under which he includes the small islands adjacent to various parts of its coasts, and the more considerable southern island called Van Diemen's Land.

In this extended sense I shall use Terra Australis in the following observations, but when treating of the principal Land separately, shall continue to employ its generally received name New Holland; that I may be more readily understood by botanists, for whom these observations are intended, and preserve consistency with the title of a work, part of which I have already published, on the plants of that country.

In the following pages I have endeavoured to collect such general, and at the same time, strictly botanical, observations on the vegetation of Terra Australis, as our very limited knowledge of this vast country appears already to afford. To these observations are added descriptions of a few remarkable plants, which have been selected for publication, from the extensive and invaluable collection of drawings made by Mr. Ferdinand Bauer in New Holland, chiefly during the voyage of the Investigator.

* These figures throughout the volume correspond with the paging in the original.

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The materials for the present essay were acquired principally in the same voyage, from Captain Flinders's account of which a general notion of the opportunities afforded for observation may be gathered. It seems necessary, however, [§34] to present in one view the circumstances under which our collections were formed, both in the Investigator's voyage, and subsequently, during a stay of eighteen months in New South Wales and Van Diemen's Island; as also to state other sources from which additional materials have been obtained. By this means the reader will be better enabled to judge how far I am entitled to make those observations of a more general nature which he will find in the following pages.

The first part of New Holland examined in Captain Flinders's voyage was the South Coast, on various and distant points of which, and on several of its adjacent islands we landed, in circumstances more or less favorable for our researches. The survey of this coast took place from West to East, and our first anchorage was in King George Third's Sound, in 35° S. lat. and 118° E. lon. In this port we remained for three weeks, in the most favorable season for our pursuits; and our collection of plants, made chiefly on its shores and a few miles into the interior of the country, amounts to nearly 500 species, exclusive of those belonging to the class Cryptogamia, which, though certainly bearing a small proportion to phænogamous plants, were not, it must be admitted, equally attended to. At our second anchorage, Lucky Bay of Captain Flinders's chart, in 34° S. lat. and about 4° to the eastward of King George's Sound, we remained only three days, but even in that short time added upwards of 100 species to our former collection.

Goose-Island Bay, in the same latitude and hardly one degree to the eastward of the second anchorage, where our stay was also very short, afforded us but few new plants; and the remaining parts of the South Coast, on five distant points of which we landed, as well as on seven of its adjacent Islands, were still more barren, altogether producing only 200 additional species. The smallness of this num-

ber is to be accounted for, partly, no doubt, from the less favorable season in which this part of the coast was examined; but it appeared to depend also in a considerable degree on its greater sterility, and especially that of its islands.

Of New South Wales, or the East Coast of New Holland, scarcely any part beyond the tropic was examined in the voyage; our first landing after leaving Port Jackson being at Sandy Cape, in nearly 25° S. lat. Between this and 21° S. lat. we had many, and upon the whole, favorable opportunities for observation, especially at Port Curtis, Keppel Bay, Port Bowen, Strong-tide Passage, Shoal-¹⁵³⁵ water Bay, and Broad Sound, the survey of which was completed; we landed also on two of the Northumberland and on one of the Cumberland Isles.

On the North Coast we landed on Good's Island, one of the Prince of Wales' Isles of Captain Cook; for a few hours at Coen River on the east side of the Gulf of Carpentaria; and in more favorable circumstances on many of the islands and some points of the mainland on the west side of this Gulf. Several of the group called the Company's Islands in the chart, the shores of Melville Bay, of Caledon Bay, and a small part of Arnhem Bay were also examined.

We then left the coast, owing to the decayed state of the ship, which, on our return to Port Jackson, was surveyed and pronounced unfit for the prosecution of the voyage.

Captain Flinders having, in consequence of this, determined to repair immediately to England, for the purpose of obtaining another vessel to complete the objects of the expedition, Mr. Bauer and myself agreed to remain in the colony of New South Wales until his return, or, if that should not take place, for a period not exceeding eighteen months. During this time we added very considerably to our collections of plants, within the limits of the Colony of Port Jackson and its dependent settlements; the banks of the principal rivers and some part of the mountains bounding the colony were examined; I visited also the north and south extremities of Van Diemen's Land, remaining several months in the vicinity of the river Derwent; and repeatedly

landed on Kent's Islands, in Bass' Strait, on the shores of which the principal part of the Submarine Algae contained in our collections were found.

The reader of Captain Flinders's narrative is already acquainted with the unfortunate circumstances that prevented his revisiting Port Jackson within the expected period, soon after the expiration of which we embraced an opportunity of returning to England, where we arrived in October, 1805, with the greater part of our collections, and without having absolutely lost any one species; though many of our best specimens of the South Coast, and all the living plants collected in the voyage perished in the wreck of the Porpoise.

The collection of Australian plants thus formed amounts to nearly 3900 species. But before embarking in the voyage [556] of Captain Flinders, I enjoyed no common advantages, through the liberality of Sir Joseph Banks, in whose Herbarium I had not only access to nearly the whole of the species of plants previously brought from Terra Australis, but received specimens of all those of which there were duplicates. Of these plants, exceeding 1000 species, the far greater part were collected by Sir Joseph Banks himself, in the voyage in which New South Wales was discovered. The rest were found at Adventure Bay in Van Diemen's Land, by Mr. David Nelson, in the third voyage of Captain Cook; at King George's Sound on the southwest coast of New Holland, by Mr. Menzies, in Captain Vancouver's voyage; and in the colony of New South Wales by several botanists, especially the late Colonel Paterson and Mr. David Burton. Since my return from New Holland I have had opportunities of examining, in the same Herbarium, many new species, found in New South Wales by Mr. George Caley, an acute and indefatigable botanist, who resided nearly ten years in that colony: and have received from the late Colonel Paterson several species discovered by himself within the limits of the colony of Port Dalrymple; which was established under his command.

I have also examined, in the Sherardian Herbarium at

Oxford, the greater part of the plants brought from Shark's Bay by the celebrated navigator Dampier, and have seen a few additional species from that and other parts of the West Coast of New Holland, collected in the voyage of Captain Baudin.

The additional species obtained from all these collections are upwards of 300; my materials, therefore, for the commencement of a Flora of Terra Australis amount to about 4200 species; a small number certainly for a country nearly equal in size to the whole of Europe, but not inconsiderable for the detached portions of its shores hitherto examined.

In Persoon's Synopsis, the latest general work on phænogamous plants, their number is nearly 21,000. The cryptogamous plants already published, by various authors, exceed 6000; and if to these be added the phænogamous plants that have appeared in different works since the publication of Persoon's Synopsis, and the unpublished species of both classes already existing in the collections of Europe, the number of plants at present known may be estimated at 33,000, even exclusive of those peculiar to Terra Australis.

The observations in the present essay being chiefly on extensive tribes of plants, they are necessarily arranged ^{as} according to the natural method.

Of this method the primary classes are DICOTYLEDONES, MONOCOTYLEDONES, and ACOTYLEDONES.

These three divisions may be admitted as truly natural, and their names, though liable to some exceptions, appear to me the least objectionable of any hitherto proposed.

Of the Australian plants at present known, upwards of 2900 are Dicotyledonous; 860 Monocotyledonous; and 400 Acotyledonous, Ferns being considered as such.

It is well known that Dicotyledonous plants greatly exceed Monocotyledonous in number; I am not however aware that the relative proportions of these two primary divisions have anywhere been given, or that it has been inquired how far they depend on climate. Into this subject I can enter only very generally in the present essay.

According to the numbers already stated the Dicotyledones of Terra Australis are to be Monocotyledones as rather more than 3 to 1, or somewhat less than 7 to 2.

In Persoon's Synopsis, to which, as the latest general work, I again refer, these two classes are to each other nearly as 11 to 2. But, from the nature of this compilation, it may be assumed that certain difficult and extensive orders of Monocotyledones, especially Gramineæ and Cyperaceæ, are considerably under-rated; an addition of 500 species to Monocotyledones would make the relative numbers of the two classes as 9 to 2, which I am inclined to think an approximation to the true proportion.

With a view to determine how far the relative proportions of these two classes are influenced by climate, I have examined all the local catalogues or Floras which appeared most to be depended on, and have likewise had recourse to unpublished materials of great importance in ascertaining this point. The general results of this examination are, that from the equator to 30° of latitude, in the northern hemisphere at least, the species of Dicotyledonous plants are to Monocotyledones as about 5 to 1; in some cases considerably exceeding, and in a very few falling somewhat short of this proportion; and that in the higher latitudes a gradual diminution of Dicotyledones takes place, until in about 60° N. lat. and 55° S. lat. they scarcely equal half their intratropical proportion.

In conformity with these results the Dicotyledones should be to the Monocotyledones of Terra Australis as nearly 9 to 2; whereas the actual proportion as deduced from our materials is hardly 7 to 2: but it appears, on arranging these materials geographically, that the relative proportions of the different regions of Terra Australis itself, are equally at variance with these results. About half the species of Australian plants at present known have been collected in a parallel included between 33° and 35° S. lat.; for this reason, and for one which will hereafter appear, I shall call this the *principal parallel*. At the eastern extremity of this parallel, within the limits of the colony of Port Jackson, where our materials are the most perfect, the propor-

tion of Dicotyledones to Monocotyledones does not exceed 3 to 1. At the western extremity of the same parallel, in the vicinity of King George's Sound, the proportion is but little different from that of Port Jackson, being nearly as 13 to 4. At the south end of Van Diemen's Island in 43° S. lat., it is fully 4 to 1. And with this proportion that of Carpentaria, and I may add the whole of the equinoctial part of New Holland, hitherto examined, very nearly agrees.

I confess I can perceive nothing either in the nature of the soil or climate of Terra Australis, or in the circumstances under which our collections were formed, to account for these remarkable exceptions to the general proportions of the two classes in the corresponding latitudes of other countries.

With regard to the proportion of Acotyledones in Terra Australis, it is necessary to premise that I consider my collections of some of the Cryptogamous order, especially of Fungi, as very imperfect. If, however, 300 species were added to the 400 actually collected, I believe it would give an approximation to the true proportions, which on this supposition, would be of Phænogamous to Cryptogamous plants as nearly 11 to 2. But the general proportion of these two great divisions, as deduced from the published materials, is very different from this, being nearly 7 to 2.

If we inquire in what degree these proportions are dependent on climate, we find that in the more northern parts of Europe, as in Lapland and even in Great Britain, Cryptogamous plants somewhat exceed the Phænogamous in number. In the south of Europe, even making allowance for its being at present less perfectly examined, these proportions seem to be inverted. And within the tropic, unless at very great heights, Cryptogamous plants appear to form hardly one fifth of the whole number of species. But their proportion in Terra Australis is still smaller than the assumed intratropical proportion: for this, however, in the northern parts of New Holland at least, the comparative want of shade and moisture, conditions essential to the vegetation of several of these tribes, will in some measure

account; for at the southern extremity of Van Diemen's Island, where the necessary conditions exist, the relative proportion of Cryptogamous plants is not materially different from that of the south of Europe.

In that which I have called the principal parallel of New Holland, however, Cryptogamous plants appear to be much less numerous than in the corresponding latitudes of the northern hemisphere; and within the tropic they probably do not form more than one twelfth of the whole number of species.

In several of the islands of the Gulf of Carpentaria, having a Flora of Phænogamous plants exceeding 200 species, I did not observe a single species of Moss.

From the three primary classes of plants already treated of I proceed at once to those groups called NATURAL ORDERS or Families; for the intermediate divisions are too much at variance with the natural series to be made the subject of such general remarks as have been already offered on the primary classes, and which are equally admissible with respect to the natural families.

A methodical, and at the same time a natural, arrangement of these families is, in the existing state of our knowledge, perhaps impracticable. It would probably facilitate its future attainment, if at present, entirely neglecting it, attention were turned to the combination of these orders into Classes equally natural, and which, on a thorough investigation, might equally admit of being defined. The existence of certain natural classes is already acknowledged, and I have, in treating of the Australian natural families, ventured to propose a few that are perhaps less obvious, still more, however, might have been suggested had this been the place for pursuing the subject.

[540] The natural orders in the *Genera Plantarum* of Jussieu are exactly 100; subsequent observations of Jussieu himself and of other botanists have considerably increased their numbers, so that in the lately published *Théorie Élémentaire de la Botanique* of Decandolle they amount to 145.

The plants of Terra Australis are referable to 120

natural orders, some of which are not included in Decandolle's list.

On such of these as either contribute largely to form the mass or the striking peculiarities of the Australian vegetation, I proceed to offer a few observations, chiefly on their geographical distribution, and more remarkable points of structure: taking them nearly in the same series in which they are given by Decandolle in the work already referred to.

MALVACEÆ. The Malvaceæ may be considered as a class including several orders, namely, *Malvaceæ* of Jussieu,¹ *Sterculiaceæ* of Ventenat,² *Chlenaceæ* of Du Petit Thouars,³ *Tiliaceæ* of Jussieu,⁴ and an order very nearly related to the last, and perhaps gradually passing into it, but which I shall in the mean time, distinguish under the name of *Buttneriaceæ*.

Of the *Malvaceæ* strictly so called, upwards of fifty species have been observed in Terra Australis, where the maximum of the order appears to be within the tropic. In the principal parallel Malvaceæ are more abundant at its eastern than its western extremity; and at the south end of Van Diemen's Island two species only have been observed. There is nothing very peculiar in the structure or appearance of the New Holland plants of this family; most of them belong to genera already established, and several of the species are common to other countries.

BUTTNERIACEÆ.⁵ The Australian portion of *Buttneriaceæ* consists of *Abroma*, *Commersonia*, *Lasiopetalum*, and several unpublished genera, intermediate to the last two.

¹ *Gen. pl.* 271.

² *Malmais.* 91.

³ *Plant. des isles d'Afrique*, 46.

⁴ *Gen. pl.* 289.

⁵ **BUTTNERIACEÆ.** *Calyx* 1-ph. 5-fid. æqualis, marcescens, aestivatione valvata. *Petala* 5: vel basi saccata superne variè producta; vel minuta squamuliformia; quandoque nulla. *Stamina* hypogyna, definita: *Filamenta* antherisera cum laciniis calycis alternantia, simplicia, vel 2-3 connata; *sterilibus* quandoque alternantibus. *Ovarium* 3-5 loculare, loculis 2-polyspermis, ovulis erectis: *Styli* 3-5, saepius connati: *Stigmata* simplicia. *Capsula* 3-5-loc. *Semina*: umbilico strophiolato. *Embryo* erectus, in axi albuminis carnosí ejus dimidio

The greater part of the order exists in the principal parallel, very few species have been observed within the tropic, and one only in Van Diemen's Island.

Lasiopetalum, the most extensive genus of the family, was established by Dr. Smith,¹ who considered it to belong to Ericeæ. Ventenat,² taking a different view of its structure, has assigned some plausible reasons for referring it to Rhamneæ. From both these orders it appears to me sufficiently distinct, and it is certainly more nearly related to the genera with which I have placed it.

DILLENIACEÆ. It was first, I believe, proposed by Mr. Salisbury to separate Dillenia, Wormia, Hibbertia, and Candollea from the Magnoliæ of Jussieu, and to form them into a distinct order, which he has called *Dilleneæ*.³ It is remarkable that Decandolle,⁴ who has adopted this order, should also limit it to these genera, Jussieu⁵ having previously suggested the separation of Dillenia from Magnoliæ and its combination with Tetracera and Curatella, genera which certainly belong to Dilleniaceæ, as do also Pleurandra of Labillardière⁶ and Hemistemma of Du Petit Thouars.⁷

The Dilleniaceæ appear to be more abundant in Terra Australis than in any other part of the world, nearly seventy Australian species having already been observed; most of these belong to Hibbertia and Pleurandra, both of which are very generally diffused, their maximum, however, is in the principal parallel, to the western extremity of which Candollea seems to be limited. Hemistemma, Wormia, ^{542]} and an unpublished genus remarkable for its thickened filaments and flat leafless stems, are found only within the tropic. The remaining genera of the order have not yet been observed in New Holland.

longior. Frutices raro Arbores, pubesce saxe stellari. Folia alterna, simplicia, stipulata, saxe dentata. Pedunculi subcynosci, oppositifolii; pedicellis plurimum bracteatis.

¹ Linn. soc. transcript. 4, p. 216.

² Malmais. 59. Dec. gen. nov. p. 7.

³ Paradis. Lond. 73.

⁴ Annales du mus. 17, p. 400.

⁵ Annales du mus. 14, pp. 129-130.

⁶ Plant. Nov. Holl. 2, p. 5.

⁷ Gen. nov. Madagasc. n. 61.

Magnoliaceæ and Dilleniaceæ appear to me to form two orders of one natural class. These orders are sufficiently distinct from each other in most cases, both in fructification and habit; they are not, however, easily defined. The ovaria, which are indefinite in number, in the greater part of Magnoliaceæ, are also so in certain Dilleniaceæ; there are likewise examples in both orders, in which they are reduced to unity; and the stipulation of Magnoliaceæ exists in Wormia.

PITTOSPOREÆ.¹ Authors have generally been disposed to consider Pittosporum, Bursaria, and Billardiera, as belonging to Rhamneæ or Celastrinæ, from both of which they are certainly widely different; and they appear to me to constitute, along with some unpublished Australian genera, a very distinct natural family. PITTOSSPOREÆ form a small tribe chiefly belonging to Terra Australis, where most of them have been observed in the principal parallel; but certain species of all the published genera exist at the south end of Van Diemen's Island, and both Pittosporum and Bursaria are found within the tropic. Pittosporum, the only genus of the order which is not confined to Terra Australis, has the most extensive range in that country, and has been found in many other parts of the world, namely, New Zealand, Norfolk Island, the Society and Sandwich Islands, the Moluccas, in China, Japan, and even Madeira. It has not, however, been observed in any part of America.

POLYGALÆ.² The curious observation of Richard,

¹ PITTOSSPOREÆ. *Calyx* 5-ph. (raro 1-ph. 5-fid) æstivatione imbricata. *Petala* 5: unguibus conniventibus, nunc cohaerentibus; laminis patulis, æstivatione imbricatis. *Stamina* 5, hypogyna, distincta, cum petalis alternantia. *Ovarium* loculis placentive 2-5 polyspermis: *Style* 1: *Stigmata* numero placentarum. *Pericarpium* capsulare vel baccatum, loculis polyspermis quandoque incompletis. *Embryo* minutus, prope umbilicum, inclusus albumine carnosö. *Frutices* vel *Arbores*. *Folia* simplicia, alterna, exstipulata. *Flores* terminales, vel axillares, quandoque polygami.

² POLYGALÆ. *Calyx* 5-ph. raro 5-fid. æstivatione imbricata: sœpius irregularis: foliolis 2 lateralibus interioribus majoribus quandoque petaloideis;

[543] that the arillus of the seed, whether general or partial, is never found in the Dicotyledonous orders with monopetalous flowers, seems to have determined Jussieu¹ and other French botanists to remove *Polygala*, remarkable for its *caruncula umbilicalis*, from Rhinanthaceæ, with which they had placed it, and to consider it, along with some nearly related genera, as forming a distinct polypetalous order. They appear to me, however, not to have taken so correct a view of the structure of its Corolla as Adanson,² who very justly observes that both in this genus and *Securidaca*, which he rightly associates with it, the apparently monopetalous corolla is made up of three petals, united by means of the cohering filaments, the external sutures remaining visible; but Adanson himself has not observed the minute rudiments of two additional petals in *Securidaca*, the existence and position of which assist in explaining the nature of the irregularity in *Polygala*, where no such rudiments are found, but in which the corolla is in every other respect very similar. A much nearer approach to regularity, however, takes place in an unpublished genus, having five petals, which, though irregular, are of nearly equal size and similarly connected by the cohering filaments, likewise five in number. The essential characters of the order Polygaleæ to which *Krameria*, *Monnina*, *Salomonia*, and several unpublished genera also belong, consist in the hypogynous insertion of its corolla, which is always irregular, and frequently reduced to three petals, connected together by the cohering filaments, whose antheræ are simple and bursting only at the top.

reliquorum duobus anterioribus (respectu spicæ) tertio postico. Petala 3-5, mediante tubo stamiueo connexa, raro distinta. Stamina hypogyna, 8 (nunc 3, 4 vel 5): filamentis inferne connatis in tubulum hinc apertum inde petala connectentem: Antheræ simplices, basi insertæ, poro apicis dehiscentes. Ovarium 2-loc. (quandoque 1-3 loc.) ovulis solistariis pendulis: Stylus 1: Stigma sœpe bilabiatum. Pericarpium sœpius capsulare, bilocular, bivalve, valvis medio septigeris: nunc Drupa vel Samara. 1-2 sperm. Semina pendula, umbilico (in capsularibus) strophiolato vel comoso. Embryo in axi albuminis carnosus vix longioris, quandoque (præsertim in pericarpiis clausis) deficientis. Herbae vel Frutices, ut plurimum glabri. Folia simplicia indivisa alterna exstipulata. Flores spicati sœpius terminales.

¹ *Annales du mus. 14, p. 386, et seq.*

² *Fam. des Plantes, 2, p. 348.*

About thirty species of this order are found in Terra Australis ; these are either Comespermæ or Polygalæ, with a single species of Salomonia of Loureiro, a genus ⁵⁴⁴ which is certainly not monandrous, as that author affirms, but has four connected filaments with distinct unilocular antheræ, and consequently half the number of stamina usually found in the order. Most of the Comespermæ exist in the principal parallel, and equally at both its extremities ; several, however, are found beyond it, and in both directions ; the genus extending from Arnhem's Land to Adventure Bay. The greater part of the Polygalæ and the genus Salomonia exist only within the tropic.

TREMANDRÆ.¹ The genus *Tetratheca* of Dr. Smith and one very nearly related to it, which I shall hereafter publish under the name of *Tremandra*, constitute a small tribe of plants peculiar to Terra Australis. For this tribe I prefer the name *Tremandreæ* to that of *Tetrathecaceæ*, as it is more distinctly, and at the same time more correctly descriptive of the structure of stamina in both genera ; the four distinct cells in the ripe state of the antheræ not existing in *Tremandra*, nor even in all the species of *Tetratheca*. In the quadrilocular antheræ of the latter genus there is indeed nothing peculiar, that being the original structure of all those antheræ which are commonly described as bilocular ; and the difference in this case depending on the mode of bursting, which, when lateral, necessarily obliterates two of the septa, but when terminal, as in *Tetratheca*, admits of their persistence. It is remarkable that both Dr. Smith and Labillardière have mistaken the fungous appendix of the apex of the seed for an umbilical

¹ TREMANDRÆ. *Calyx* 4-5 ph. æqualis, æstivatione valvata. *Petala* 4-5, æqualia : æstivatione involuta stamna includentia. *Stamina* 8-10, hypogyna, distincta : *Antheræ* 2-4 loculares, basi insertæ, poro tubuloso apieis deliquescentes. *Ovarium* 2-loc. loculis 1-3-spermis, ovulis pendulis : *Stylus* 1 : *Stigmata* 1-2. *Capsula* bilocularis, bivalvis, valvis medio septigeris. *Semina* umbilico nudo : extremitate opposita appendiculata; albuminosa. *Embryo* in axi albuminis carnosí cujus dimidio longior: *radicula* umbilicum spectante. *Fruticuli* ericoides. *Folia* sparsa vel verticillata, exstipulata. *Pedunculi* axillares, uniflori.

caruncula, a mistake involving a second, that of considering the seeds erect in the capsule, and which has led Labillardière into a third error, namely, describing the radicule of the embryo as pointing towards this supposed umbilical appendix.

[545] The Tremandreae are in several respects nearly related to Polygalæ; they appear to me, however, sufficiently distinct, not only in the regularity of the flower, and in the structure of antheræ, but in the aestivation of both calyx and corolla, in the appendix of the seed being situated at its apex, and not at the umbilicus, and, I may also add, in a tendency to produce an indefinite number of ovula in each cell of the ovary.

The greater number of Tremandreae are found in the principal parallel of New Holland, they extend also to the south end of Van Diemen's Island, but none have been observed within the tropic.

DIOSMEÆ. To this natural order, in addition to the Australian genera hereafter to be mentioned, and the south African genus from which its name is derived, I refer Fagara, Zanthoxylon, Melicope, Jambolifera, Euodia, Pilocarpus, Empleurum, and Dictamnus: and four genera of equinoctial America, namely, Cusparia of Humboldt and Bonpland, Ticorea and Galipea of Aublet, and Monnieria, if not absolutely of this order, belong at least to the same natural class.

Both Ruta and Peganum may be annexed to Diosmeæ, but neither of them are calculated to give a clear idea of the order, from the usual structure and habit of which they deviate in some important points; I have therefore proposed to derive the name of the family from one of its most extensive and best known genera. The first section of Jussieu's Rutaceæ is sufficiently different to admit of its being considered a distinct order, which may be named Zygophylleæ.

Diosmeæ are numerous in Terra Australis, and form, at least in its principal parallel and more southern regions, a striking feature in the vegetation. Nearly seventy species

have been observed, of which the greater part are referable to *Boronia*, *Correa*, *Eriostemon*, and *Zieria*, of Dr. Smith, and *Phebalium* of Ventenat. Of these genera *Boronia* is both the most extensive and the most widely diffused, existing within the tropic, and extending to the South end of Van Diemen's Island; like the others, however, its maximum is in the principal parallel, at both extremities of which it is equally abundant. *Correa*, though extending to the south end of Van Diemen's Island, is not found within the tropic, nor was it observed at the western extremity of the principal parallel; in the intermediate part of which, however, where many of the peculiarities in the [546] vegetation of the parallel are less remarkable, or entirely wanting, it may be said to abound.

Eriostemon, which appears to be most abundant at the eastern extremity of the principal parallel, has not been observed either at its western extremity or intermediate part; it extends, however, to the south end of Van Diemen's Island on the one hand, and within the tropic as far as Endeavour River on the other.

Phebalium, very nearly related to *Eriostemon*, has like that genus its maximum at the eastern extremity of the principal parallel, it is found also at the western extremity of this parallel, and as far as the south end of Van Diemen's Island, but it has not been observed within the tropic.

Zieria seems to be limited to the eastern extremity of the principal parallel, and the more southern regions.

The most remarkable plant of the order with regard to structure, is that imperfectly figured and described in Dampier's voyage.¹ Of this genus, which may be named *DIPLOLÆNA*, I have examined Dampier's original specimen in the Sherardian Herbarium at Oxford, and others recently collected, also at Shark's Bay, in the voyage of Captain Baudin, and have ascertained that what appear to be calyx and corolla in this singular plant, are in fact a double involucrum containing many decandrous flowers, whose stamina and pistilla exactly agree with those of the

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Vol. 3, p. 110, tab. 3, f. 3.

order, but of which the proper floral envelopes are reduced to a few irregularly placed scales.

Another Australian genus of Diosmeæ differs from the rest of the order in having a calyx with ten divisions, an equal number of petals, and an indefinite number of stamens with evidently perigynous insertion.

MYRTACEÆ.¹ This is one of the most extensive tribes in Terra Australis, in which considerably above 200 species have already been observed, and where the order is also more strikingly modified than in any other part of the world. It is very generally spread over the whole of Australia, but its maximum appears to be in the principal parallel. Many observations might here with propriety be introduced on the more remarkable structures which occur among the Australian Myrtaceæ; I must, however, [§ 47] confine myself to a few remarks on the distribution of the most extensive genera.

Of *Eucalyptus* alone nearly 100 species have been already observed; most of these are trees, many of them of great and some of enormous dimensions. *Eucalyptus globulus* of Labillardière and another species peculiar to the south end of Van Diemen's Island, not unfrequently attain the height of 150 feet, with a girth near the base of from 25 to 40 feet. In the colony of Port Jackson there are also several species of great size, but none equal to those of Van Diemen's Island; and no very large trees of this genus were seen either on the south coast or in the equinoctial part of New Holland. Mr. Caley has observed within the limits of the colony of Port Jackson nearly 50 species of *Eucalyptus*, most of which are distinguished, and have proper names applied to them, by the native inhabitants, who, from differences in the colour, texture, and scaling of the bark, and in the ramification and general appearance of these trees, more readily distinguish them than botanists have as yet been able to do. *Eucalyptus*, although so generally spread over the whole of Terra Australis, and so abundant as to form at least four fifths of its forests, is

¹ Myrti. *Juss. gen.* 322.

hardly found beyond this country. I am acquainted with one exception only, in an additional species which is said to be a native of Amboyna.

Next to *Eucalyptus* in number, is the beautiful genus *Melaleuca*, of which upwards of 30 Australian species have already been observed, exclusive of *Tristania*, *Calothamnus*, *Beaufortia*, and an unpublished genus which I separate from it. The maximum of *Melaleuca* exists in the principal parallel, but it declines less towards the south than within the tropic, where its species are chiefly of that section which gradually passes into *Callistemon*, a genus formed of those species of *Metrosideros* that have inflorescence similar to that of *Melaleuca*, and distinct elongated filaments. With the exception of two species of this section, namely, *Melaleuca leucadendron*, and *M. Cajeputi*, the genus *Melaleuca* appears to be confined to Terra Australis.

Leptospermum, of which, nearly 30 Australian species have been observed, exists also in New Zealand and in the Moluccas. In Terra Australis its maximum is decidedly in the principal parallel, and like *Melaleuca*, it is much more abundant in the southern regions than within the tropic.

Bæckia, to which I refer *Imbricaria* of Dr. Smith, as [548] well as the opposite-leaved *Leptospermums*, is also an extensive Australian genus, having its maximum in the principal parallel, extending like the two former genera to the highest southern latitude, and hardly existing within the tropic: one species, however, has been found in New Caledonia, and that from which the genus was formed is a native of China.

COMBRETACEÆ.¹ I have formerly² made some

¹ COMBRETACEÆ. *Calyx superus*: limbo 4-5-fido, æquali. *Petala* 4-5 vel nulla. *Stamina* 8-10; quandoque lacinias calyeis æqualia et cum iisdem alternantia. *Ovarium* uniloculare, ovulis 2-4, ab apice loculi pendulis absque receptaculo communis vel columna centrali: *Stylus* 1: *Stigma* 1. *Pericarpium* monospermum, clausum, figura et textura varium, *Drupa* v. *Samara*. *Semen* ex-albuminosum. *Embryo* cotyledonibus sæpius involutis: plumula inconspicua.

Arbores vel Frutices. *Folia simplicia, integra, exstipulata, alterna nunc opposita, raro punctato-pellucida*. Flores spicati, axillares.

² *Prodr. fl. Nov. Holl.* 351.

remarks on the structure and limits of Combretaceæ, one of whose principal characters consists in the unilocular ovary with two or more ovula simply pendulous from the upper part of its cavity, and not inserted, as in Santalaceæ, into a central receptacle or column. Guiera of Jussieu, having the same structure, and also leaves dotted with pellucid glands, appears to connect this order with Myrtaceæ.

The Australian Combretaceæ, which belong to Terminalia, Chuncoa, and Laguncularia, are not numerous, and all of them are found within the tropic.

CUNONIACEÆ.¹ This order, several of whose genera have been referred to Saxifrageæ, is more readily distinguished from that family by its widely different habit, than by any very important characters in its fructification ; like ⁵⁴⁹ *Saxifrageæ* also it comprehends genera with ovarium superum and inferum.

The genera strictly belonging to *Cunoniaceæ* are Weinmannia, Cunonia, Ceratopetalum, Calycomis, and Codia. To this order Bauera may also be referred, but it must form a separate section from the genera already mentioned. Of these *Weinmannia*, *Ceratopetalum* and *Calycomis* are found in Terra Australis, and hitherto only at the eastern extremity of its principal parallel, where also *Bauera* is most abundant ; but this genus is found beyond the parallel in one direction, extending to the southern extremity of Van Diemen's Island.

RHIZOPHOREÆ.² The genera Rhizophora, Bruguiera,

¹ CUNONIACEÆ. *Calyx* 1-ph. 4-5-fidus, semisuperus vel inferus. *Petala* 4-5; raro nulla. *Stamina* perigyna, definita, 8-10. *Ovarium* biloculare, loculis 2-polyspermis : *Style* 1-2. *Pericarpium* biloculare, capsulare vel clausum. *Embryo* in axi albuminis carnosus.

Arbores vel Frutices. *Folia opposita, composita vel simplicia, saepius stipulata stipulis interpetiolaribus.*

² RHIZOPHOREÆ. *Calyx* superus 4-5-fidus, aestivatione valvata. *Petala* 4-5. *Stamina* perigyna, 8-15. *Ovarium* 2-loc. loculis 2-polyspermis ovulis pendulis : *Style* 1. *Pericarpium* clausum, monospermum. *Semen* exalbuminosum. *Embryo* sepe germinans et pericarpium semisuperum perforans.

Arbores. *Folia opposita, simplicia, stipulis interpetiolaribus.*

and *Carallia*, all of which are found in the equinoctial part of New Holland, form a distinct natural order which may be called *Rhizophoreæ*. This order agrees with *Cunoniaceæ* in its opposite leaves and intermediate stipulæ, and with great part of them in the aestivation of its calyx, and in the structure and cohesion of the ovary. From these it differs chiefly in the want of albumen and greater evolution of its embryo. Jussieu¹ has combined *Rhizophora* and *Bruguiera* with *Loranthus* and *Viscum*, neglecting some very obvious, and, as they appear to me, important differences in the flower, and probably never having had an opportunity of comparing the very distinct structures of their ovaria; the affinity too of *Rhizophoreæ* to *Cunoniaceæ* is unquestionable, and it will hardly be proposed to unite both these tribes with *Loranthus*, which I consider as even more nearly related to *Proteaceæ*.

HALORAGEÆ. The greater part of the genera of which this order is composed, have been referred to *Onagriæ*, to certain parts of which they no doubt very nearly approach; but it must appear rather paradoxical to unite *Fuchsia* in the same family with *Myriophyllum* and even *Hippuris*, and it would be in vain to attempt a definition ⁵⁵⁰ of an order composed of such heterogenous materials. By the separation of the order here proposed it becomes at least practicable to define *Onagriæ*. It is still, however, difficult to characterise *Halorageæ*, which will probably be best understood by considering as the type of the order the genus *Haloragis*, from which all the others differ by the suppression of parts or separation of sexes. Thus *Meionectes*, an unpublished genus of New Holland, is reduced to half the number of parts both of flower and fruit. *Prosperpinaca* is deprived of petals and of one fourth of all the other parts. *Myriophyllum*, which is monococious, has the complete number of parts in the male flower, but in the female wants both calyx and corolla; what several authors have described as petals being certainly bracteæ.

¹ *Annales du mus.* 12, p. 288.

Serpicula differs from *Myriophyllum* in having only half the number of stamens in the male flower, and in its unilocular four-seeded ovary.

Hippuris, though retaining the habit of *Myriophyllum*, yet having a monandrous hermaphrodite flower without petals, and a single-seeded ovary, is less certainly reducible to this order: and it may appear still more paradoxical to unite with it *Callitricha*, in which, however, I am inclined to consider what authors have denominated petals as rather analogous to the bracteæ in the female flower of *Myriophyllum* and *Serpicula*, and to both these genera *Callitricha* in the structure of its pistillum, and even in habit, very nearly approaches.

The Australian genera of this order are *Haloragis*, *Meionectes*, *Myriophyllum*, and *Callitricha*.

Of *Haloragis*, many new species have been observed in Terra Australis, in every part of which this genus is found, most abundantly, however, at both extremities of the principal parallel.

That *Gonocarpus* really belongs to the same genus, I am satisfied from an examination of original specimens sent by Thunberg himself, to Sir Joseph Banks, for in these I find not only petals, but eight stamens and a quadrilocular ovary.

LEGUMINOSÆ.¹ This extensive tribe may be considered as a class divisible into at least three orders, to which proper names should be given. Of the whole class about 2000 species are at present published, and in Terra Australis, where this is the most numerous family, considerably more than 400 species have already been observed.

One of the three orders of Leguminosæ which is here for the first time proposed may be named MIMOSÆ. It consists of the Linnean *Mimosa*, recently subdivided by Willdenow into five genera, along with *Adenanthera* and *Prosopis*.

¹ *Juss. gen.* 345.

This order is sufficiently distinguished from both the others by the hypogynous insertion and valvular aestivation of its corolla, which being perfectly regular differs in this respect also from the greater part of Lomentaceæ and from all the Papilionaceæ.

Nearly the whole of the Australian species of the Linnean genus *Mimosa* belong to *Acacia* of Willdenow, as it is at present constituted ; and about nine tenths of the Acaciæ to his first division of that genus, described by him as having simple leaves, but which is in reality aphyllous ; the dilated foliaceous footstalk performing the functions of the true compound leaf, which is produced only in the seedling plant, or occasionally in the more advanced state in particular circumstances, or where plants have been injured.

The great number of species of *Acacia* having this remarkable economy in Terra Australis forms one of the most striking peculiarities of its vegetation. Nearly 100 species have already been observed ; more than half of these belong to the principal parallel, at both extremities of which they appear to be equally abundant ; they are, however, very generally diffused over the whole country, existing both on the north coast of New Holland, and at the south end of Van Diemen's Island. But though the leafless Acaciæ are thus numerous and general in Terra Australis, they appear to be very rare in other parts of the world ; none of the Australian species are found in other countries, and at present I am acquainted with only seven additional species, of which five are natives of the intratropical Islands of the southern hemisphere ; the sixth was observed in Owhyhee, and is said to be the largest tree in the Sandwich Islands ; the seventh is *Mimosa stellata* of Loureiro, upon whose authority it entirely rests.

The second order, LOMENTACEÆ or CÆSALPINEÆ, comprehends all the genera having perigynous stamens, a corolla whose aestivation is not valvular, and which though [552] generally irregular is never papilionaceous. To these characters may be added the straight embryo, in which they

agree with Mimosæ, but differ from all the Papilionaceæ except Arachis and Cercis.

The Lomentaceæ of New Holland are not numerous, and consist chiefly of the genus Cassia, the greater part of whose species grow within the tropic. On the east coast they probably do not extend beyond 35° lat.; and on the south coast only one species has been observed, it was found in 32° S. lat. and is remarkable in being aphyllous, with dilated footstalks exactly like the Acaciæ already noticed.

The third order, PAPILIONACEÆ, which comprehends about three fourths of the whole class at present known, includes also nearly the same proportion of the Australian Leguminosæ.

Papilionaceæ admit of subdivision into several natural sections, but in Terra Australis they may be divided almost equally, and without violence to natural affinities, into those with connected and those with distinct stamina.

The decandrous part of the whole order bears a very small proportion to the diadelphous, which in Persoon's synopsis is to the former as nearly 30 to 1, while in Terra Australis, as I have already stated, the two tribes are nearly equal.

This remarkably increased proportion of Decandrous Papilionaceous plants, forms another peculiarity in the vegetation of New Holland, where their maximum exists in the principal parallel. They are not so generally spread over the whole of Terra Australis, as the leafless Acaciæ, for although they extend to the southern extremity of Van Diemen's Island, they are even there less abundant, and very few species have been observed within the tropic. Papilionaceous plants with distinct stamina do not in fact form a very natural subdivision of the whole order, though those of New Holland, with perhaps one or two exceptions, may be considered as such: this Australian portion, however, forms nearly three fourths of the whole section, at present known; the remaining part, consisting of genera, most of which are very different, both from each other and from those of Terra Australis, are found at the Cape of

Good Hope, in equinoctial and North Africa, in the different regions of America, in New Zealand, in India, very sparingly in North Asia, and lastly in the South of Europe, where, [553] however, only two species have been observed, namely, *Anagyris foetida*, and *Cercis siliquastrum*; but the latter having a straight embryo and a habit approaching to that of *Bauhinia*, rather belongs to Lomentaceæ.

Among the Diadelphous genera of Terra Australis the most remarkable in habit and structure, namely *Platylobium*, *Bossiæa*, *Hovea*, *Scottia*, and *Kennedia*, are found chiefly in the principal parallel and higher latitudes; within the tropic the greater part of these cease to exist, and most of the genera which there occur are common to other countries, especially India.

ATHEROSPERMEÆ.¹ Jussieu, in his excellent memoir on *Monimieæ*² has referred *Pavonia* of Ruiz and Pavon and *Atherosperma* of Labillardière to that order, from the other genera of which, namely, *Ambora*, *Monimia*, and *Ruizia*, they appear to me very different, not only in the insertion of the seed, the texture of the albumen, and relative size of the embryo, but in having antheræ similar to those of Laurinæ. I separate them therefore into a distinct family with the name of AETHEROSPERMEÆ. The propriety of this separation is confirmed by the discovery of two New Holland plants, evidently belonging to this family, but which have hermaphrodite flowers; a structure not likely to occur in *Monimieæ*, in which what has been termed calyx is more properly an involucrum.

¹ AETHEROSPERMEÆ. *Flores* diclines vel hermaphroditæ. *Calyx* monophyllus, limbo diviso: lacinii sæpe duplice serie, interioribus omnibus semipetaloideis: *Squamulæ fauicæ* in femineis et hermaphroditis. *Corolla* nulla. *Stamina* in masculis floribus numerosa, fundo calycis inserta, squamulis aucta; in hermaphroditis pauciora, fauce imposita: *Antheræ* adnatae, biloculares, loculis valvula longitudinali a basi ad apicem dehiscenti. *Ovaria* uno plura, sæpius indefinita, monosperma, ovulo erecto: *Styli* simplices, nunc laterales v. basilares: *Stigmata* indivisa. *Pericarpia* clausa seminiformia, stylis persistentibus plumosis aristata, tubo aucto calycis inclusa. *Embryo* erectus brevis, in basi albuminis carnosæ mollis.

Arbores. *Folia opposita simplicia exstipulata*. Pedunculi axillares, uniflori.

² *Annales du museum*, 14, p. 116.

The place of Atherospermeæ in the natural series is not very easily determined. It is singular that differing so widely as they certainly do in most parts of their structure from Laurinæ they should notwithstanding agree with them in the economy of their antheræ, and very remarkably with some of them in their sensible qualities. Of the [554] three Australian plants of this order two are found in the colony of Port Jackson, the third through the whole of Van Diemen's Island. Pavonia of the Flora Peruviana (*Laurelia* of Jussieu), a native of a similar climate, and possessing the same sensible qualities, is more nearly related to *Atherosperma* than is generally supposed, differing from it merely in the oblong form and regular bursting of its female calyx.

RHAMNEÆ. Into this order I admit such genera only as have ovarium cohering more or less with the tube of the calyx, of which the laciniæ have a valvular aestivation; stamens equal in number to these laciniæ, and alternating with them; an ovary with two or three cells and a single erect ovulum in each; an erect embryo generally placed in the axis of a fleshy albumen, or entirely without albumen; the petals, which are opposite to the stamens, and inclose the antheræ in their concave laminæ, are in some cases wanting.

With these characters *Rhamnus*, *Ziziphus*, *Paliurus*, *Ceanothus* (from which *Pomaderris* is hardly distinct), *Colletia*, *Cryptandra*, *Phylica*, *Gouania*, *Ventilago*, and probably *Hovenia* correspond. In comparing this description of Rhamneæ with that of Buttneriaceæ formerly given, they will be found to coincide in so many important points, that the near relationship of these two orders cannot be doubted, and thus an unexpected affinity seems to be proved between Rhamneæ and Malvaceæ.

In Terra Australis upward of thirty species of Rhamneæ belonging to *Ziziphus*, *Ceanothus*, *Pomaderris*, *Colletia* and *Cryptandra*, have been observed, and chiefly in its principal parallel or southern regions.

CELASTRINÆ.¹ This order comprehends the greater part of the first two sections of the Rhamni of Jussieu; it is obviously different from the more limited order of Rhamneæ, which I have already attempted to define, and in many respects so nearly approaches to the *Hippocrateæ* of Jussieu,² that it may be doubted whether they ought not to be united.

In New Holland the Celastrinæ are not numerous, nor do they form any part of its characteristic vegetation; their distribution is somewhat different from that of Rhamneæ, for they are found either in the principal parallel, or within the tropic.

STACKHOUSEÆ.³ Stackhousia of Dr. Smith,⁴ and an unpublished genus, exactly agreeing with it in flower, but remarkably different in fruit, form a small tribe of plants, sufficiently distinct from all the natural orders hitherto established. I have placed it between Celastrinæ and Euphorbiaceæ; to both of which, but especially to the former, it seems to be related in a certain degree.

The Stackhouseæ are peculiar to Terra Australis, and though found chiefly in its principal parallel, extend more sparingly both to the southern extremity of Van Diemen's Island, and to the North coast of New Holland.

¹ CELASTRINÆ. *Calyx* 4-5-partitus, aestivatione imbricata. *Petala* 4-5. *Stamina* totidem, cum petalis alternantia, insertione ambiguè perigyna. *Ovarium* liberum, 2-4-loculare loculis 1-polyspermis, ovlis erectis (rarò pendulis): *Style*s 1-4. *Pericarpium* capsulare, vel clausum (Baccatum, Drupaceum vel alatum.) *Semina* in capsularibus arillata. *Embryo* fere longitudine albuminis carnosí, axilis.

Frutices vel Arbores. *Folia simplicia* (rarò composita) alterna vel opposita, stipulata stipulis sæpius minutis, quandoque nullis.

² *Annales du mus.* 18, p. 486.

³ STACKHOUSEÆ. *Calyx* 1-ph. 5-fidus, æqualis: tubo ventricoso. *Petala* 5, æqualia, summo tubo calycis inserta: unguibus cohærentibus in tubum calyce longiorem; laminis angustis stellato-patulis. *Stamina* 5, distincta, inæqualia (duo alterna breviora), fauci calycis inserta. *Ovarium* liberum, 3-5-lobum, lobis discretis monospermis, ovlis erectis: *Styli* 3-5, nunc basi cohærentes: *Stigmata* indivisa. *Pericarpium* 3-5-coccum, coccus evalvibus, apteris v. alatis; columna centrali persistenti. *Embryo* erectus axilis, longitudine albuminis carnosí.

Herbæ. *Folia simplicia, integrerrima, sparsa, quandoque minuta:* Stipulæ laterales minutissimæ. Spica terminalis; floribus tribracteatis.

⁴ *Linn. soc. transact.* 4, p. 218.

EUPHORBIACEÆ.¹ This is an extensive and very general family, of which about 100 species have already been observed in Terra Australis. Of these the greater part exist within the tropic, but the order extends to the southern extremity of Van Diemen's Island, and the greater number of the genera peculiar to this country are found in the principal parallel or higher latitudes.

^{556]} The species of *Euphorbia* are not numerous in Terra Australis, most of them are intratropical plants, and all of them are referable to one section of the genus. It appears to me that the name of the order ought not to be taken from this genus, which is so little calculated to afford a correct idea of its structure that authors are still at variance in the names and functions they assign to several parts of the flower. The view I take of the structure of *Euphorbia* is, in one important particular at least, different from those given by Lamarck,² Ventenat,³ Richard⁴ and Decandolle,⁵ though possibly the same that Jussieu has hinted at;⁶ so briefly, however, and I may add obscurely, that if his supposition be really analogous to what I shall presently offer, he has not been so understood by those who profess to follow him in this respect.

With all the authors above quoted, I regard what Linneus has called calyx and corolla in *Euphorbia* as an involucrum, containing several male flowers which surround a single female. By some of these authors the male flowers are described as monandrous, and in this respect, also, I agree with them; but the body, which all of them describe as a jointed filament, I consider to be made up of two very distinct parts, the portion below the joint being the foot-stalk of the flower, and that above it the proper filament; but as the articulation itself is entirely naked, it follows that there is no perianthium; the filiform or laciniated scales which authors have considered as such, being on this supposition analogous to bractæ. The female flower, in conformity with this supposition, has also its pedunculus, on

¹ *Jus. gen.* 384.

² *Encyclop. botan.* 4, p. 413.

³ *Tableau*, 3, p. 487.

⁴ *In Michaux. fl. bor. Amer.* 2, p. 209.

⁵ *Flor. Franc.* 3, p. 329.

⁶ *Gen. pl.* 386.

the dilated, and in a few cases obscurely lobed, apex of which the sessile ovary is placed. If this be a correct view of the structure of *Euphorbia*, it may be expected that the true filament or upper joint of what has commonly been called filament, should, as in other plants, be produced subsequent to the distinct formation of the anthera, which consequently will be found at first sessile on the lower joint or peduncle, after that has attained nearly its full length ; and accordingly this proves to be the case in such species as I have examined. Additional probability is given to this view by the difference existing between the surfaces ^[557] of the two joints in some species. I consider it, however, as absolutely proved by an unpublished genus of this order, having an involucrum nearly similar to that of *Euphorbia*, and like it, inclosing several fasciculi of monandrous male flowers, surrounding a single female ; but which, both at the joint of the supposed filament, and at that by which the ovary is connected with its pedicellus, has an obvious perianthium, regularly divided into lobes.

UMBELLIFERÆ.¹ This order may be considered as chiefly European, having its maximum in the temperate climates of the northern hemisphere ; in the corresponding southern parallels it is certainly much less frequent, and within the tropics very few species have been observed. In Terra Australis the Umbelliferæ, including a few Araliæ, which belong at least to the same natural class, exceed 50 species. The greater part of these are found in the principal parallel, in which also those genera deviating most remarkably from the usual structure of the order occur. The most singular of these is *Actinotus* of Labillardière,² which differs from the whole order in having a single ovulum in the unimpregnated ovary. A second genus, which I shall hereafter publish with the name of *Leucolæna*, is worthy of notice on account of the great apparent differences of inflorescence existing amongst its species ; which agree in habit,

¹ *Jus. gen.* 218.

² *Nov. Holl. pl. spec.* 1, p. 67, t. 92. *Eriocalia*, *Smith exot. bot.* 2, p. 37.

in the more essential parts of fructification, and even in their remarkable involucella. Of this genus, one species has a compound umbel of four many-flowered radii; a second has an umbel of three rays with two or three flowers in each; several others, still retaining the compound umbel, which is proved by the presence of their involucella, have from four to two single-flowered rays: and lastly one species has been observed, which is reduced to a single flower; this flower, however, is in fact the remaining solitary ray of a compound umbel, as is indicated by the two bractæ on its footstalk, of which the lower represents the corresponding leaf of the general involucrum, while the upper is evidently similar to the involucellum of the two-rayed species of the genus.

[558] **COMPOSITÆ.**¹ Of this family, which is the most extensive among Dicotyledones, upwards of 2500 species have been already described. About 300 are at present known in Terra Australis, in which therefore the proportion of Compositæ to its Dicotyledonous plants is considerably smaller than that of the whole order to Dicotyledones generally, and scarcely half that which exists in the Flora of South Africa. It is also inferior in number of species to Leguminosæ, like which it seems expedient to consider it as a class including several natural orders. Of these orders *Cichoraceæ* and *Cinarocephalæ* are comparatively very rare in Terra Australis, not more than ten species of both having hitherto been observed.

The class therefore chiefly consists of *Corymbiferæ*, which are very generally diffused; they are however evidently less numerous within the tropic, and their maximum appears to exist in Van Diemen's Island. *Corymbiferæ* may be subdivided into sections and the greater part of the genera peculiar to Terra Australis belong to that section which may be named *Gnaphaloideæ*, and exist either in the principal parallel or higher latitudes.

The whole of *Compositæ* agree in two remarkable points

¹ *Adans. fam. 2, p. 103. Decand. Theor. elem. 216.*

of structure in their corolla; which, taken together at least, materially assist in determining the limits of the class. The first of these is its valvular aestivation, this, however, it has in common with several other families. The second I believe to be peculiar to the class, and hitherto unnoticed. It consists in the disposition of its fasciculi of vessels, or nerves; these, which at their origin are generally equal in number to the divisions of the corolla, instead of being placed opposite to these divisions and passing through their axes, as in other plants, alternate with them; each of the vessels at the top of the tube dividing into two equal branches running parallel to and near the margins of the corresponding laciniae, within whose apices they unite. These, as they exist in the whole class, and are in great part of it the only vessels observable, may be called primary. In several genera, however, other vessels occur, alternating with the primary and occupying the axes of the laciniae: in some cases these secondary vessels, being most distinctly visible in the laciniae, and becoming gradually fainter as they descend the tube, may be regarded as recurrent; originating from the united apices of the primary branches; but ^[559] in other cases where they are equally distinct at the base of the tube, this supposition cannot be admitted. A monopetalous corolla not splitting at the base is necessarily connected with this structure, which seems also peculiarly well adapted to the dense inflorescence of Compositæ; the vessels of the corolla and stamina being united, and so disposed as to be least liable to suffer by pressure.

As this disposition of vessels is found in *Ambrosia* and *Xanthium*, they ought not to be separated from Compositæ as Richard¹ has proposed; and as it does not exist in *Brunonia* I prefer annexing that genus to Goodenoviæ, with which it agrees in the peculiar indusium of the stigma.

GOODENOVIÆ.² This order I have formerly separated from Campanulaceæ, considering the peculiar membranous cup surrounding the stigma, along with a certain irregu-

¹ *Annales du mus.* 8, p. 184.

² *Prodr. fl. Nov. Holl.* 573.

larity in the corolla, as sufficient distinguishing characters, especially as these are accompanied by other differences which appear to me important. In Goodenoviae I have not included Lobelia, which, however, has also an irregular corolla, and although it wants the peculiar indusium of the stigma, has in its place a fasciculus or pencil of hair surrounding that organ. This structure has been regarded by Jussieu and Richard, in a very learned memoir, more recently written on the subject,¹ as analogous to the indusium of Goodenoviae, to which they have therefore added Lobelia and derived the name of the order from this, its most extensive and best known genus. To the opinion of these authors I hesitate to accede, chiefly for the following reasons :

1st. In Goodenoviae the deeper fissure of the tube of the corolla exists on its inner or upper side, a circumstance readily determined in those species having single spikes. In Lobelia, on the other hand, the corresponding fissure is on the outer or lower side, a fact, however, which can only be ascertained before the opening of the corolla, the flowers in the greater number of species becoming resupinate in the expanded state, a circumstance that does not appear to have been before remarked. The relation therefore not only of the corolla but of the calyx and stamina to the axis of inflorescence, is different in these two tribes.

[560] 2ndly. In Goodenoviae the greater part of the tube of the corolla is formed by the cohesion of five laciniae, the distinct inflected margins of which are in most cases visible nearly to its base ; these laciniae are in some cases unconnected, as in *Diaspasis*, and more remarkably still in *Cyphia*, which is actually pentapetalous. I have observed no such structure in Lobelia.

3rdly. At the period of bursting of the antheræ the stigma in Lobelia is almost completely evolved, and capable of receiving impregnation from the pollen of the same flower ; the function therefore of its surrounding pencil, is similar to that of the hairs which are almost equally obvious

¹ *Annales du mus.* 18, p. 1.

in many Compositæ, especially Cinarocephalæ. On the contrary, in Goodenoviæ the stigma at the same period is hardly visible, and is certainly not then capable of receiving impregnation from the pollen of its proper flower; it is therefore either impregnated by the antheræ of different flowers, or in some cases at a more advanced stage by the pollen of its own antheræ, which is received and detained in the indusium. To these arguments for the exclusion of Lobelia I may add that in the greater part of Goodenoviæ with dehiscent fruit the dissepiment is parallel to the valves of the capsule, in which respect they differ equally from Lobelia and the valvular-fruited Campanulaceæ; and lastly, that many species of Lobelia as well as Campanulaceæ contain a milky juice of which there is no instance in Goodenoviæ. If, therefore, in Lobelia the pencil surrounding the stigma and the irregularity of the corolla, which, however, in some species is hardly perceptible, be considered as characters sufficient to separate this extensive genus from Campanulaceæ, it may form a separate order, admitting, perhaps, of subdivision into several distinct genera.

I have formerly observed¹ that in two genera of Goodenoviæ, namely, *Euthales* and *Velleia*, the base of the corolla coheres with the ovary while the calyx remains entirely distinct. This structure I had stated as being peculiar to these genera, and as in some degree invalidating one of Jussieu's arguments for considering the floral envelope of Monocotyledones as calyx rather than corolla. The fact, however, seems not to be admitted by Richard, who in the dissertation already quoted² describes what has hitherto been called calyx in *Velleia* as bracteæ; a view of the structure which in those species of that genus having triphyllous calyx may appear plausible, but of which the probability is [561] diminished even in those with pentaphyllous calyx, and still more in *Euthales*, where the calyx is also tubular. But a stronger argument for the part usually denominated calyx being in these genera really such may be derived from certain species of Goodenia, in which it will be admitted that both calyx and corolla are present, and where, though

¹ *Prod. fl. Nov. Holl.* 580.

² *Annales du mus.* 18, p. 27.

both these envelopes adhere to the ovary, they may be separately traced to its base; the coloured corolla being plainly visible in the interstices of the foliaceous calyx.

Goodenoviae, whose maximum exists in the principal parallel of New Holland, are nearly but not absolutely confined to Terra Australis; the only known exceptions to this consist of the genus *Cyphia*, which is peculiar to Africa, and chiefly occurs at the Cape of Good Hope; of some species of *Scævola* which are found within the tropics; and of *Goodenovia littoralis*, which is common to the shores of Terra Australis and New Zealand, and according to Cavallilles is also a native of the opposite coast of South America.

STYLIDEÆ.¹ This order, consisting of *Stylium*, *Levenhookia*, and *Forstera*, I have formerly separated from *Campanulaceæ*, on account of its reduced number of stamens, and the remarkable and intimate cohesion of their filaments with the style, through the whole length of both organs. It differs also both from *Campanulaceæ* and *Goodenoviae* in the imbricate aestivation of the corolla, and where its segments are unequal in the nature of the irregularity. In the relation which the parts of its flower have to the axis of inflorescence, and in the parallel septum of its capsule, it agrees with *Goodenoviae* and differs from *Lobelia*, which, however, in some other respects it more nearly resembles.

Very different descriptions of the sexual organs in this tribe, and especially of the female, have been given by several French botanists. According to Richard the lateral appendices of the labellum in *Stylium* are the real stigmata, the style being consequently considered as cohering with the tube of the corolla, and the column as consisting of stamens only. This view of the structure demands particular notice, not only from the respect to which its author is himself entitled, but because it has also been adopted by Jussieu,² whose arguments in support of it, and against the common opinion, may be reduced to three. 1st. Were the common opinion admitted, the difficulty of conceiving so wide a difference in what he terms insertion of stamens

¹ *Prod. fl. Nov. Holl.* 565.

² *Annales du mus.* 18, p. 7.

in two orders so nearly related as Campanulaceæ and Stylideæ obviously are: 2ndly. The alleged non-existence of the stigma, which preceding authors had described as terminating the column: and lastly, the manifest existence of another part, which, both from its appearance and supposed origin is considered as capable of performing the function of that organ.

In opposition to these arguments it may be observed, that the real origin of the stamens is in both orders the same, the apparent difference arising simply from their accretion to the female organ in Stylideæ, a tendency to which may be said to exist in Lobelia. The inability to detect the stigma terminating the column in *Stylium* must have arisen from the imperfection of the specimens examined, for in the recent state, in which this organ is even more obvious than in *Goodenoviae* at the time of bursting of the antheræ, it could not have escaped so accurate an observer as Richard; and were it even less manifest in *Stylium*, its existence would be sufficiently confirmed from the strict analogy of that genus with *Levenhookia*, whose stigma, also terminating the column, consists of two long capillary laciniae, which are in no stage concealed by the antheræ.

With respect to the part considered as stigma by Richard I have formerly observed that it is obsolete in some species of *Stylium* and entirely wanting in others,¹ and there is certainly no trace of anything analogous to it in *Forstera*.

The greater part of the Australian *Stylideæ* exist at the western extremity of the principal parallel, several species are found at the eastern extremity of the same parallel, and a few others occur both within the tropic and in Van Diemen's Island. Beyond Terra Australis very few plants of this order have been observed; two species of *Stylium*, very similar to certain intratropical species of New Holland, were found in Ceylon and Malacca, by Koenig; and of the only two known species of *Forstera*, one is a native of New Zealand, the other of Terra del Fuego, and the opposite coast of Patagonia.

¹ *Bauer illustr. tab. 5.*

[563] RUBIACEÆ.¹ As this order is now constituted it appears to me impracticable to distinguish it from Apocineæ, by characters taken from the fructification alone; and even if the Stellatæ or Asperuleæ be excluded, and the remarkable stipulation of its remaining sections be taken into account, it will not then, perhaps, admit of a definition entirely free from exceptions. It must also, I think, be allowed that Rubiaceæ, Apocineæ, Asclepiadæ, and certain genera at present referred to Gentianeæ, form but one great natural class. In this class the leaves are uniformly simple, perfectly entire, and, with a very few exceptions, occurring in Asclepiadæ and Apocineæ, also opposite; while in the parts of fructification there are hardly any characters that are not liable to exceptions, unless the monopetalous regular corolla, and stamens alternating with its laciniaæ and not exceeding them in number.

The order *Rubiaceæ*, admitting it as it is at present established, is chiefly equinoctial. In Terra Australis its maximum is also within the tropic, where, however, it is not very numerous; and the most remarkable Australian part of the order, consisting of *Opercularia* and *Pomax*, is chiefly found in the principal parallel. Jussieu is very unwilling to admit these two genera into Rubiaceæ, and is rather disposed to consider them as a distinct family; chiefly on account of their single-seeded ovary. To prove that this character alone, however, is not of such importance as to separate plants into different natural orders, it is sufficient to advert to Proteaceæ, Amaranthaceæ, and Epacridæ, all of which contain genera with one, two, and even an indefinite number of seeds; and as Operculariæ entirely agree with many genera of Rubiaceæ in other points of structure of fructification, in habit, and especially in their remarkable stipulation, I think there can be no doubt that they ought to be referred to the same order, of which they form a section, characterised not only by its single-seed ovary, but by the peculiar dehiscence of its compound fruit.

¹ *Juss. gen.* 196.

APOCINEÆ.¹ I have already observed² that this order is very nearly related to Rubiaceæ and Gentianeæ; the former appearing to differ chiefly in its remarkable stipulæ, the latter in its minute embryo. If these characters be admitted, certain New Holland genera which I have placed with Gentianeæ will either be transferred to Rubiaceæ, or, as I have formerly proposed,³ may, with some others, constitute a family intermediate to Rubiaceæ and Apocineæ.

This order or section, which may be named LOGANEÆ, will consist of Logania, Geniostoma (from which Anasser of Jussieu is not distinct), Usteria, Gærtnera of Lamarck,⁴ Pagamea of Aublet, and, perhaps, Fagræa. Of these, the only New Holland genus is *Logania*, the greater part of whose species are found in the principal parallel. In this genus, which admits, however, of subdivision, the importance of stipulation seems to be entirely lost, for it contains species agreeing in this respect with Rubiaceæ, others in which the stipulæ are lateral and distinct, and one species, at least, in which they are entirely wanting.

There is an evident affinity between certain species of Logania and *Mitrasacme*, which I had therefore placed in Gentianeæ. *Mitrasacme* is very general in Terra Australis, but its maximum is within the tropic; it is not absolutely confined to New Holland, for I have observed in the Sherardian Herbarium two species collected at Cheusan, by Mr. Cunningham.

Among the true Apocineæ of New Holland, which are chiefly found within the tropic, the most remarkable genus is Alyxia, in which the albumen and embryo agree with those of the very different family Annonaceæ.

ASCLEPIADEÆ.⁵ These plants differ from Apocineæ solely in the peculiar structure of their genitalia, a character, however, which appears to me fully sufficient to justify their separation. They are not very numerous in New

¹ *Prodr. fl. Nov. Holl.* 465. Apocinearum pars, *Juss. gen.* 143.

² Werner. *soc. transact.* 1, p. 12.

³ *Prodr. fl. Nov. Holl.* 455.

⁴ *Illustr. gen. tab.* 167.

⁵ Werner. *soc. transact.* 1, p. 12; *Prodr. fl. Nov. Holl.* 458.

Holland, where they are found chiefly within the tropic, and I have not observed any plant of the order in that country in a higher latitude than 34° S.

EPACRIDEÆ.¹ The abundance of this family in Terra Australis constitutes one of the peculiarities of its vegetation. About 140 species have already been observed, the greater part of which are found in the principal parallel; the order, however, continues numerous at the south end of Van Diemen's Island, where several genera appear that have not been met with in other parts; within the tropic very few species have been observed, and none with capsular fruit.

Epacrideæ, with the exception of two species found in the Sandwich Islands, are confined to the southern hemisphere; several species have been observed in New Zealand, a few in the Society Islands, and even in the Moluccas; the only species with capsular fruit found within the tropic is *Dracophyllum verticillatum*, observed by Labillardière in New Caledonia; and the only plant of the family known to exist in America is an unpublished genus, also with capsular fruit, found by Sir Joseph Banks in Terra del Fuego.

The sections into which I have divided this order differ from each other in two remarkable points of structure. The *Stypheleæ*, as they may be called, having a valvular or very rarely a plaited aestivation of the corolla, and a definite number of seeds; while the *Epacrideæ*, strictly so called, have along with their indefinite number of seeds and capsular fruit a corolla with imbricate aestivation. I have formerly² pointed out what seems to be the natural subdivision of this section, depending more on the differences of insertion in its leaves than on characters derived from the parts of fructification.

LABIATÆ and VERBENACEÆ appear to me to form one natural class, the two orders of which gradually pass into each other. Terra Australis contains several remarkable genera of both orders, and chiefly in its principal pa-

¹ *Prodr. fl. Nov. Holl.* 535. *Ericarum genera.* *Juss. gen.* 160.

² *Prodr. fl. Nov. Holl.* 536.

rallel. *Chloanthes*¹ is the most singular among Verbenaceæ, having, with the fruit of that order, entirely the habit of Labiatæ.

Westringia and Prostanthera, with the genera nearly related to each of these, are the most worthy of notice among Labiatæ; all of them are limited to Terra Australis, and they are found chiefly in its principal parallel, but Westringia and Prostanthera abound also in Van Diemen's Island, and extend, though more sparingly, in the opposite direction as far as the tropic. *Prostanthera* is remarkable [506] in the appendages to its antheræ, in the texture of its fruit, and in the remains of albumen existing in the ripe seeds of several of its species. *Westringia*, and its related genera Microcorys and Hemigenia, differ from the rest of the order in having verticillate leaves, and from the greater part in the structure of antheræ, particularly in the order in which these organs become abortive. *Westringia*, according to Dr. Smith, has resupinate corolla, a term which in this case cannot allude to a mere inversion in the form of its lips, for this does not exist; and if it mean an absolute change in the relation of its parts to those of the calyx or to the included organs, it cannot, I apprehend, be admitted either in this genus or in any other of the order. The fact which I formerly stated² against the resupination of corolla in Labiatæ is the uniformity of its aestivation in this order, in which the upper lip always covers the lower. To those who do not consider this as a sufficient proof, the following, drawn from another equally uniform point of structure, may perhaps appear more satisfactory. In Labiatæ, as well as in several other orders with irregular flowers, the deviation from the usual quinary division of calyx and corolla in Dicotyledones, does not consist in an absolute suppression of parts, but merely in their confluence, a fact indicated by the disposition of vessels; thus the upper lip of the corolla, which in this order generally consists of one piece, either entire or more or less deeply bifid, is always furnished with two longitudinal nerves equidistant from its axis, which is without vessels; while each of the

¹ Bauer illustr. tab. 4.

² Prodr. fl. Nov. Holl. 499.

three laciniæ usually forming the lower lip has a single nerve passing through its axis ; the upper lip is therefore to be considered, even when entire, as made up of two confluent laciniæ ; and if this test be allowed to be conclusive, and applied to the corolla of those genera of Labiatæ in which it is supposed to be resupinate, the opinion will be found to be erroneous.

MYOPORINÆ.¹ The principal characters in the fructification of this order, by which it is distinguished from Verbenaceæ, are the presence of albumen in the ripe seed, and the direction of the embryo, whose radicule always points towards the apex of the fruit. The first of these characters, however, is not absolute, and neither of them can [567] be ascertained before the ripening of the seed ; for previous to the complete development of the embryo the fluid albumen or liquor amnios equally exists in both orders ; and although all the genera of Verbenaceæ have an embryo whose radicule points towards the base of the fruit, yet many of them have pendulous seeds, and consequently a radicule remote from the umbilicus. Hence *Avicennia*,² which I formerly annexed to Myoporinæ, should be restored to Verbenaceæ, with which also it much better agrees in habit.

Myoporinæ, with the exception of *Bontia*, a genus of equinoctial America, and of two species of *Myoporum* found in the Sandwich Islands, has hitherto been observed only in the southern hemisphere, and yet neither in South Africa nor in South America beyond the tropic. Its maximum is evidently in the principal parallel of Terra Australis, in every part of which it exists ; in the more southern parts of New Holland, and even in Van Diemen's Island it is more frequent than within the tropic. The genus *Myoporum* is also found in New Zealand, Norfolk Island, New Caledonia, and the Society Islands.

PROTEACEÆ.³ I have formerly⁴ offered several obser-

¹ *Prodr. fl. Nov. Holl.* 514.

³ *Ibid.*

² *Prodr. fl. Nov. Holl.* 518.

⁴ *Lin. soc. transact.* 10, p. 15.

vations both on the geographical distribution and on some of the more remarkable points of structure of this order of plants. I shall now therefore confine myself to a few of the most important facts on each of these subjects.

Proteaceæ are chiefly natives of the southern hemisphere, in which they are most abundant in a parallel included between 32° and 35° lat., but they extend as far as 55° S. lat. The few species found in the northern hemisphere occur within the tropic.

Upwards of 400 species of the order are at present known ; more than half of these are natives of Terra Australis, where they form one of the most striking peculiarities of the vegetation. Nearly four fifths of the Australian Proteacceæ belong to the principal parallel, in which, however, they are very unequally distributed ; the number of species at its western extremity being to those of the eastern as about two to one, and, what is much more remarkable, the number even at the eastern extremity being to that of the middle of the parallel as at least four to one. From the principal parallel the diminution of the order in number of species is nearly equal in both directions ; but while no genus has been met with [568] within the tropic which does not also exist in the principal parallel, unless that section of *Grevillea* having a woody capsule¹ be considered as such, several genera occur at the south end of Van Diemen's Island which appear to be peculiar to it.

No Australian species of this order has been observed in any other part of the world, and even all its genera are confined to it, with the exception of *Lomatia*, of which several species have been found in South America ; and of *Stenocarpus*, the original species of which is a native of New Caledonia.

The genera of Terra Australis that approach most nearly to the South African portion of the Proteacceæ exist in the principal parallel, and chiefly at its western extremity ; those allied to the American part of the order are found either at the eastern extremity of the same parallel or in Van Diemen's Island.

¹ *Cycloptera*, *Lin. soc. transact.* 10, p. 176 ; *Prod. fl. Nov. Holl.* 380.

There is no species of Proteaceæ common to the east and west coasts of New Holland, and certain genera abound at one extremity of the principal parallel which at the opposite extremity are either comparatively rare or entirely wanting.

I have formerly remarked that in this order no instance of deviation from the quaternary division of the perianthium has been observed ; a fact which is the more remarkable as this is itself a deviation from the prevailing quinary number in the floral envelopes of Dicotyledonous plants.

There is a peculiarity in the structure of the stamens of certain genera of Proteaceæ, namely, *Simsia*, *Conospermum*, and *Synaphea*, in all of which these organs are connected in such a manner that the cohering lobes of two different antheræ form only one cell.

Another anomaly equally remarkable exists in *Synaphea*, the divisions of whose barren filament so intimately cohere with the stigma as to be absolutely lost in its substance, while the style and undivided part of the filament remain perfectly distinct.

SANTALACEÆ. I have formerly¹ proposed and at [569] tempted to define this natural order, one of whose most remarkable characters consists in its unilocular ovary, containing more than one, but always a determinate number of ovula, which are pendulous and attached to the apex of a central receptacle. This receptacle, which varies in its figure in the different genera, in some being filiform, in others nearly filling the cavity of the ovary, had not been previously noticed in any plant of the order.

The greater part of the Santalaceæ of Terra Australis are found in the principal parallel, to which several genera, namely, *Leptomeria*, *Corethrum*, and *Fusanus*, are nearly limited ; *Santalum*, on the other hand, is found chiefly within the tropic.

I have added *Exocarpus* and *Anthobolus* to this order, with certain genera of which they agree in habit and many points of structure, both of the flower and fruit ; but they

¹ *Prodr. fl. Nov. Holl.* 350.

are readily distinguishable from the whole order by their fructus superus, and they may possibly differ also in the internal structure of their ovarium, which has not yet been satisfactorily ascertained.

The genus *Exocarpus* is most abundant in the principal parallel and southern parts of Terra Australis, but it is not unfrequent even within the tropic. *Exocarpus cupressiformis* is not only the most common species of the genus, but the most general tree in Terra Australis, being found in nearly the whole of the principal parallel, in every part of Van Diemen's Island that has been visited, and even within the tropic. I am acquainted with only three plants that have in that country an equally extensive range. These are *Anthistiria australis*, the most valuable grass as well as the most general plant in Terra Australis; *Arundo Phragmites*, less frequent than the former, but which extends from the southern extremity of Van Diemen's Island to the north coast of New Holland; and *Mesembryanthemum æquilaterale*, which occurs on almost every part of the sandy sea shores of both these islands.

Exocarpus is not absolutely confined to Terra Australis, for M. Bauer has discovered a very remarkable species bearing its flowers on the margins of dilated foliaceous branches, analogous to those of *Xylophylla*; and *Xylophylla longifolia*, which was taken up by Linnaeus from Rumphius,¹ [570] appears more probably, both from the description and figure of that author, to be also a species of *Exocarpus*.

There is so great a resemblance between the enlarged fleshy receptacle of *Exocarpus* and the berry of *Taxus*, that some botanists have been led to compare these plants together in other respects. A complete coincidence in this part of their structure would not indeed prove the affinity of these two genera, any more than it does that of *Exocarpus* to *Anacardium* or *Semecarpus*, with which also it has been compared; and to determine their agreement even in this respect it is necessary to understand the origin of the berry of *Taxus*, of which very different accounts

¹ *Xylophyllos ceramica*, *Herb. amb.* 7, p. 19, t. 12.

have been given. According to Lamarck¹ it consists of the enlarged ovarium itself, perforated by the seed soon after impregnation; while Mirbel² considers it as formed of the scales of the female amentum, immediately surrounding the organ, named by him *cupula*; and considered as containing the pistillum, but which most other authors have regarded as the pistillum itself. My observations differ from both these accounts, for on examining the female fructification of *Taxus* before impregnation I find the rudiments of the future berry, consisting at that period of a narrow fleshy ring, surrounding the base only of the cupula of Mirbel, and very similar to the annular hypogynous nectarium of many flowers. If this cupula, therefore, were the pistillum itself, the berry of *Taxus* would have an origin analogous to that of *Balanites*,³ as it has been very lately described by Mirbel; and, on the other hand, if that author's view of the female fructification of *Taxus* and *Coniferæ* generally be adopted, it might then to a certain degree be compared with the external cupula of *Dacrydium*, which will be more particularly noticed hereafter; but from this it would still be very distinct both in its texture and in its not enclosing in the early stage the cupula; on neither supposition, however, does its origin agree with that of the berry of *Exocarpus*, which in some respects more nearly resembles the fleshy receptacle of *Podocarpus*.

I have annexed *Olax* to *Santalaceæ*,⁴ not, however, considering it as absolutely belonging to the same family, but as agreeing with it in some important circumstances; especially in the internal structure of its ovarium, and that of its pericarpium and seed; but as in *Olax* there appears to be a double floral envelope, as its antheriferous stamens alternate with the segments of the inner envelope, and its ovarium does not cohere with either, there are sufficient grounds for regarding it, with Mirbel, as a distinct family.

¹ *Encyclop. botan.* 3, p. 228.

² *Nouv. bulletin des scien.* 3, p. 73.

³ *Delile in mem. sur l'Egypte*, 3, p. 326. *Ximenia ægyptiaca*, Linn.

⁴ *Prodri. fl. Nov. Holl.* 357.

CASUARINEÆ. The genus *Casuarina* is certainly not referable to any natural order of plants at present established; and its structure being now tolerably understood, it may be considered a separate order, as Mirbel has already suggested.¹

The maximum of *Casuarina* appears to exist in Terra Australis, where it forms one of the characteristic features of the vegetation. Thirteen Australian species have already been observed; the greater number of these are found in the principal parallel, in every part of which they are almost equally abundant; in Van Diemen's Island the genus is less frequent, and within the tropic it is comparatively rare; no species except *Casuarina equisetifolia* having been observed on the north coast of New Holland. Beyond Terra Australis only two species have been found, namely, *C. equisetifolia*, which occurs on most of the intratropical islands of the Southern Pacific, as well as in the Moluccas, and exists also on the continent of India; and *C. nodiflora*, which is a native of New Caledonia.

In the male flowers of all the species of *Casuarina*, I find an envelope of four valves, as Labillardière has already observed in one species, which he has therefore named *C. quadrivalvis*.² But as the two lateral valves of this envelope cover the others in the unexpanded state, and appear to belong to a distinct series, I am inclined to consider them as bracteæ. On this supposition, which, however, I do not advance with much confidence, the perianthium would consist merely of the anterior and posterior valves, and these, firmly cohering at their apices, are carried up by the anthera, as soon as the filament begins to be produced, while the lateral valves or bracteæ are persistent; it follows from it also that there is no visible perianthium in the female flower, and the remarkable economy of its lateral bracteæ may, perhaps, be considered as not only affording an additional argument in support of the view now taken [572] of the nature of the parts, but also as in some degree again approximating *Casuarina* to *Coniferæ*, with which it was formerly associated.

¹ *Annales du mus.* 16, p. 451.

² *Plant. Nov. Holl.* 2, p. 67, t. 218.

The outer coat of the seed or caryopsis of Casuarina consists of a very fine membrane, of which the terminal wing is entirely composed; between this membrane and the crustaceous integument of the seed there exists a stratum of spiral vessels, which Labillardière, not having distinctly seen, has described as an "integumentum arachnoideum;" and within the crustaceous integument there is a thin proper membrane closely applied to the embryo, which the same author has entirely overlooked. The existence of spiral vessels, particularly in such quantity, and, as far as can be determined in the dried specimens, unaccompanied by other vessels, is a structure at least very unusual in the integuments of a seed or caryopsis, in which they are very seldom at all visible, and have never, I believe, been observed in such abundance as in this genus, in all whose species they are equally obvious.

CONIFERÆ.¹ The structure of the female parts of fructification in Coniferæ having, till very lately, been so little understood, and certain facts concerning it being still unpublished, I shall prefix a few observations on this subject to the remarks I have to offer on the Australian part of the order.

In the late essays of Mirbel and Schoubert on *Coniferæ*² that part of the female fructification which had previously been considered as the pistillum, having a perforated style, is described as a peculiar organ enclosing the ovary, and in most cases also the stigma. This organ, which they have named cupula, they regard as more analogous to an involucrum than to a perianthium, which, according to them, also exists, cohering, however, with the body of the ovary. Without absolutely adopting this latter part of their statement, it appears to me that impregnation really takes place in the manner these authors describe. Their principal argument is derived from the genus Ephedra, in which both the stigma and a considerable part of the style project beyond this cupula, without cohering with its aperture. In further confirmation of their opinion it may be

¹ *Juss. gen.* 411.

² *Nouv. bulletin des scienc.* 3, p. 73, 85, et 121.

observed that I have found a projection of the stigma, [573] though certainly in a much less obvious degree, both in *Agathis*¹ and in a species of *Podocarpus*.

Towards this discovery, as extending to the Coniferæ more strictly so called, an important step was made in *Pinus*, by the accurate Schkuhr,² who first correctly described and figured the cupula of that genus, but who considered it as the ovarium itself and the two processes of its aperture as stigmata. Mr. Salisbury, who seems to have been unacquainted with Schkuhr's observations, published a few years afterwards,³ the same opinion, which continued to be generally received till the appearance of the essays, already quoted, of Mirbel and Schoubert.

But these authors do not seem to be aware that certain plants of the order are even furnished with a double cupula. This is most remarkable in *Podocarpus*, in which the drupa is formed of this external cupula, whose aperture exists not at the apex, but very near its base or point of insertion. The inner cupula in this genus is in every stage entirely enclosed in the outer, and is in like manner inverted.

That this is the real structure of *Podocarpus* seems to be proved by that of the nearly related genus *Dacrydium*, hitherto so imperfectly understood. This genus has also a double cupula, the outer in the young state enclosing the inner, and both of them at this period being inverted, as in *Podocarpus*; but the inner in a more advanced stage acquires nearly an erect position, by rupturing one side of the external cupula, which, not continuing to increase proportionally in size, forms a cup surrounding the base only of the ripe fruit.

Three species of *Podocarpus* are found in Terra Australis; two of these exist in the colony of Port Jackson, the third was observed on the summit of the Table Mountain in Van Diemen's Island. *Podocarpus asplenifolia* of Labillardière⁴ is certainly not a *Podocarpus*, but either forms a distinct

¹ *Salisbury in Linn. soc. transact.* 8, p. 311. *Pinus Dammara*, *Lamb*, *pin.* p. 61, *t.* 38. ² *Botan. handb.* 3, p. 276, *t.* 308.

³ *Linn. soc. transact.* 8, p. 308.

⁴ *Plant. Nov. Holl.* 2, p. 71, *t.* 221.

genus, as Richard has already supposed,¹ or it may possibly be a species of *Dacrydium*; a conjecture which I have no means of verifying, having never seen the female fructification of this remarkable plant.

^{574]} *Callitris* of Ventenat² is peculiar to Terra Australis, where it exists very generally, but most abundantly in the principal parallel; it consists of several species, differing from each other chiefly in the form of their fruit.

Araucaria excelsa, which was first observed in Norfolk Island and New Caledonia, is found also on the east coast of New Holland, immediately within the tropic; it is there, however, a tree of very moderate dimensions, and never of that enormous size which it not unfrequently attains in Norfolk Island.

ORCHIDÆ.³ The Australian species of this order already known amount to 120; many of these, however, are of very rare occurrence, and none of them appear to be produced in abundance.

The maximum of the order exists in the principal parallel, a considerable part extends to Van Diemen's Island, and very few have been observed within the tropic.

The greater part form genera nearly or entirely peculiar to Terra Australis, and most of these genera belong to that division of the order having farinaceous pollen, with an anthera which is inserted, but not deciduous, and either parallel to the stigma or terminating the column. The two sections of this division with parallel and terminal anthera are found in New Holland to pass very gradually into each other, and several genera belonging to the former are, in that country, remarkable for the great expansion of the lateral lobes of the column. These lateral lobes I have considered as barren stamina, which, like those of *Philydrum*, are occasionally, though indeed very rarely, furnished with rudiments of antheræ. This structure, as well as that of *Cypripedium*, in which the lateral lobes are antheriferous, while the middle is barren, approximates the flower of Orchideæ to what

¹ *Annales du mus.* 16, p. 299.

² *Dec. gen. nov.* 10.

³ *Prodr. fl. Nov. Holl.* 309.

may be called the type of Monocotyledones, that is, a regular flower with ternary division of its envelope, stamina, and cells or placenta of the fruit.

I have attempted a similar approximation of true *Scitamineæ*,¹ whose processes crowning the ovarium, and usually two in number, form the complement of the stamina.

Maranteæ or *Canneæ*,² an order at present referred to [573] *Scitamineæ*, may also be reduced to this type; they differ, however, from *Scitamineæ* in the mutual relation of their barren and fertile stamina, somewhat as *Cypripedium* does from the other genera of *Orchideæ*; except that in *Maranteæ* the imperfection is greater, a single lobe only of one of the lateral stamina having the appearance of an anthera and producing pollen.

It is remarkable that so very few *Orchideæ* of Terra Australis belong to that section of the order with angular elastic pollen and adnate anthera; this section being not only the most numerous in Europe, but existing in an equal proportion, though singularly modified, at the Cape of Good Hope.

Of another section of the order, formerly comprehended under the Linnean genus *Epidendrum*, most of which, though not properly parasitical, grow upon trees, several species, chiefly belonging to *Dendrobium*, are found in New Holland. In the northern hemisphere very few plants of this section that grow on trees have been observed beyond the tropic. The only exceptions to this, that I am acquainted with, consist of two species of a genus related to *Dendrobium*, discovered by Dr. Buchanan, in Upper Nepaul;³ of *Dendrobium moniliforme*, observed by Kämpfer and Thunberg, in Japan, near Nagasaki; and of *Epidendrum conopseum*,⁴ which, according to Mr. William Bartram, grows in East Florida, in lat. 28° N.

In some parts of the southern hemisphere this section appears to have a more extensive range. On the east coast of New Holland several species of *Dendrobium* and

¹ *Prod. fl. Nov. Holl.* 305.

² *Loc. citat.* 307.

³ *Epidendrum præcox* and *Epidendrum humile*. *Smith exot. bot. tabb.* 97 and 98.

⁴ *Hort. Kew.* ed. 2, vol. 5, p. 219.

Cymbidium are found in 34° S. lat. ; but this is probably about their southern limit in that country, no species having been met with on any part of its south coast. They have, however, been observed in a considerably higher latitude in New Zealand, in the northern island of which several species were collected by Sir Joseph Banks, in about 38° S. lat., and *Epidendrum autumnale* of Forster grows in the neighbourhood of Dusky Bay, in upwards of 45° S. lat.

I am not acquainted with the limit of this section in South America ; but in South Africa, at the Cape of Good Hope, none of those, at least, that are parasitical on trees, have been observed.

[576] **ASPHODELEÆ.¹** In this order I include the greater part, both of *Asphodeleæ* and *Asparageæ* of Jussieu, distinguishable from each other only by texture and dehiscence of fruit ; differences which, as they separate *Stypandra* from *Dianella*, and *Eustrephus* from *Luzuriaga*, cannot be admitted to be of more than generic importance.

I confess myself unable to point out satisfactory distinguishing characters for this order, in my description of which, however, I have noted two circumstances, neither of them indeed peculiar to the order, but both of them appearing to extend through the whole of it ; namely, the reduction of stamens from six to three, which occasionally occurs, constantly taking place by the suppression of those opposite to the outer series of the perianthium ; and the existence of the black crustaceous testa or outer integument of the seed. It is probable I have given too much weight to this latter circumstance, in combining, partly on account of it, genera so very dissimilar as *Anthericum*, *Xanthorrhœa*, and *Astelia*.

Xanthorrhœa, which I have included in *Asphodeleæ*, is in habit one of the most remarkable genera of 'Terra Australis, and gives a peculiar character to the vegetation of that part of the country where it abounds. This genus is most frequent in the principal parallel, but it extends to the

¹ *Prodr. fl. Nov. Holl.* 274.

south end of Van Diemen's Island, and is also found within the tropic.

A plant of a very similar habit to *Xanthorrhœa*, agreeing with it in its caudex and leaves, having, however, a very different inflorescence, was observed abundantly at King George's Sound, but with fructification so decayed and imperfect that I have not been able to determine the structure either of its flower or fruit. This plant is introduced by Mr. Westall in the view of King George's Sound published in Captain Flinders's account of his voyage.

I had annexed *Hypoxis* and *Curculigo* to the Asphodelæ, chiefly on account of a similarity in the testa of the seed; but they differ so much from this order in other parts of their structure, and from Amaryllideæ both in this respect and in the singular umbilicus of the seed, as well as in habit, that it is better to consider them as forming a separate family.

Of this family, which may be called HYPOXIDEÆ,¹ only five species have been observed in Terra Australis, four of ¹⁵⁷⁷ these belong to *Hypoxis*, which is chiefly an extratropical genus, the fifth is a *Curculigo* very like those of India.

PALMÆ. Only six species of this order have been observed in New Holland, and of two of these the fructification is at present unknown.

The New Holland Palms exist chiefly within the tropic, but one species is found in 34° S. lat.; it seems, however, that this is nearly the southern limit of the order in that country, no species having been seen on any part of the South coast.

In New Zealand a species of *Areca* was observed by Sir Joseph Banks, in about 38° S. lat., which is probably nearly the limit of Palms, in the southern hemisphere. In the northern hemisphere their extent is not materially different from this: in North America, indeed, they do not appear

¹ HYPOXIDEÆ. *Perianthium superum*: limbo sexpartito, regulari, aestivatione imbricata. *Stamina sex*, imis lacinis inserta. *Ovarium* 3-loc. loculis polyspermis. *Capsula* evalvis, nunc baccata, polysperma. *Semina* umbilico laterali rostelliformi; testa atra crustacea. *Embryo* in axi albuminis carnosus; radicula vaga.

to grow beyond 36° lat.; but in Europe *Chamaerops humilis* extends as far as the neighbourhood of Nice.

It is remarkable that no species of Palm has been found in South Africa, nor was any observed by Mr. Leschenault,¹ on the West coast of New Holland, even within the tropic.

JUNCEÆ. We are now in possession of so many links connecting together the Monocotyledonous orders with regular flowers, that in attempting to define several of them, we are obliged to have recourse to differences, many of which may appear, and some of which unquestionably are, of but secondary importance. Of this kind may be considered the characters by which I have endeavoured to distinguish *Junceæ* from *Asphodelæ*, namely the difference in the texture of the perianthium, and in that of the testa of the seed, in the consistence of the albumen, and in the order of suppression of the stamens; these when reduced to three in number being always placed opposite to the three outer leaves of the perianthium: in this respect and ^{as well} in the more important character of the position of the embryo *Junceæ* differ also from *Restiaceæ*, to which they more nearly approach in habit.

Three very remarkable genera, which I have referred to *Junceæ*, are peculiar to Terra Australis. Of two of these, *Calectasia* and *Dasyppogon*, each consisting of only one species, figures and descriptions are annexed to this essay.

Of the third, *Xerotes*, 24 species have already been observed. This genus is somewhat more abundant in the principal parallel than in other parts; but it is very generally extended, and is more frequent within the tropic than in Van Diemen's Island. *Xerotes*, in the structure and appearance of its flowers and in the texture of albumen, has a considerable resemblance to Palms, but it wants the peculiar characters of the seed and also the habit of that remarkable order.

Flagellaria, which I have added to *Junceæ*, differs from *Xerotes* chiefly in its pericarpium, and in the form and relation of its embryo to the albumen, which is also of a

¹ *Annales du mus.* 17, p. 87.

different texture; in all these respects it approaches to Cyperaceæ, with some of whose genera it has even a certain resemblance in habit. This genus has usually been found only within the tropics, but in New Holland it extends as far as 33° S. lat.

Philydrum, which I have annexed to Junceæ, has always appeared to me an insulated genus, yet though not referable to any established natural order, it may be compared with several in certain respects. In the structure of its stamens it may in one point of view be said to be intermediate between Scitamineæ and Orchideæ; in that of its pericarpium and even of its seeds it has some affinity to the latter order; yet it differs from both of them in almost every other respect. In general appearance, it bears a considerable resemblance to *Cartonema*, which belongs to Commelineæ. In some parts of its structure it may be compared with *Xyris*, and perhaps with *Burmannia*; a genus which I have likewise annexed to Junceæ, but whose real affinities are equally obscure.

Philydrum pygmæum differs in so many respects from *P. lanuginosum* that it may probably hereafter be considered as a distinct genus; and a very few additions to this tribe of plants would sanction their formation into a separate natural order.

RESTITACEÆ. The principal character distinguishing this family from Junceæ and Cyperaceæ consists in its lenticular embryo being placed at the extremity of the seed opposite to the umbilicus; from Junceæ it also differs in the order of suppression of its stamens, which when reduced to three are opposite to the inner laciniae of the perianthium; and most of its genera are distinguishable from both these orders as well as from Commelineæ by their simple or unilocular antheræ.

With the exception of *Eriocaulon*, *Tolina*, and *Xyris*, the order appears to be confined to the Southern hemisphere. In Terra Australis its maximum is in the principal parallel, but it extends to the southern extremity of Van Diemen's Island, where it is even in considerable

abundance, and exists, though much more sparingly, within the tropic.

Restiaceæ are almost equally numerous at the Cape of Good Hope as in the principal parallel of New Holland. One species only of the order has been observed in New Zealand, and hitherto none in South America.

CYPERACEÆ. In Terra Australis this is a very extensive order, consisting already of more than 200 species. It contains, however, fewer peculiarities in structure than several other orders that are much less numerous. Its maximum appears to be in the principal parallel; but the species observed solely within the tropic exceed one third of the whole number. Cyperaceæ, in many respects, are nearly related to Restiaceæ, and when furnished with a true perianthium are distinguishable from the monospermous genera of that order, solely by the different position of the embryo in the seed.. But in the greater part of the order the perianthium is either entirely wanting or merely setaceous. Fuirena, Lepidosperma and Orcobolus, all of them natives of New Holland, are almost the only genera in which it is found of nearly the usual appearance.

What I have formerly termed perianthium in Carex, Diplacrum, and Schoenus nemorum, ought, perhaps, rather to be considered as internal bracteæ, analogous to those of Lepyrodia, of Irideæ, and, perhaps, to the upper valve of the inner envelope of grasses.

I have formerly remarked that the Perianthium of Hypoc^{580]} lyptum consists merely of the squamæ of a spicula, similar to that of Kyllinga, but reduced to two valves.

GRAMINEÆ. This order comprehends, at least, one fourth of the whole of Monocotyledones, and in Terra Australis, where upwards of 200 species have already been observed, it bears the same proportion to that primary division.

I have formerly, in arranging the Australian genera of Gramineæ, endeavoured to explain what I conceived to be the natural subdivision of nearly the whole order into two

great tribes. The reasons which I then assigned for this arrangement appear, however, either not to have been comprehended, or to have been considered too hypothetical. With a view of removing the supposed obscurity and strengthening my former arguments, I shall preface what I have now to say on the subject, by a few observations common to both tribes.

The natural or most common structure of *Gramineæ* is to have their sexual organs surrounded by two floral envelopes, each of which usually consists of two distinct valves : but both of these envelopes are in many genera of the order subject to various degrees of imperfection or even suppression of their parts.

The outer envelope or *gluma* of Jussieu, in most cases, containing several flowers with distinct and often distant insertions on a common receptacle, can only be considered as analogous to the bractæ or involucrum of other plants.

The tendency to suppression in this envelope appears to be greater in the exterior or lower valve, so that a gluma consisting of one valve may, in all cases, be considered as deprived of its outer or inferior valve. In certain genera with a simple spike, as *Lolium* and *Lepturus*, this is clearly proved by the structure of the terminal flower or spicula, which retains the natural number of parts ; and in other genera not admitting of this direct proof, the fact is established by a series of species showing its gradual obliteration, as in those species of *Panicum* which connect that genus with *Paspalum*.

On the other hand, in the inner envelope or *calyx* of Jussieu, obliteration first takes place in the inner or ~~upper~~ upper valve ; but this valve having, instead of one central nerve, two nerves equidistant from its axis, I consider it as composed of two confluent valves, analogous to what takes place in the calyx and corolla of many irregular flowers of other classes ; and this confluence may be regarded as the first step towards its obliteration, which is complete in many species of *Panicum*, in *Andropogon*, *Pappophorum*, *Alopecurus*, *Trichodium*, and several other genera.

With respect to the nature of this inner or proper enve-

lope of grasses, it may be observed that the view of its structure now given, in reducing its parts to the usual ternary division of Monocotyledones, affords an additional argument for considering it as the real perianthium. This argument, however, is not conclusive, for a similar confluence takes place between the two inner lateral bracteæ of the greater part of Irideæ; and with these, in the relative insertion of its valves, the proper envelope of grasses may be supposed much better to accord, than with a genuine perianthium. If, therefore, this inner envelope of grasses be regarded as consisting merely of bracteæ, the real perianthium of the order must be looked for in those minute scales, which in the greater part of its genera are found immediately surrounding the sexual organs.

These scales are in most cases only two in number, and placed collaterally within the inferior valve of the proper envelope. In their real insertion, however, they alternate with the valves of this envelope, as is obviously the case in *Ehrharta* and certain other genera; and their collateral approximation may be considered as a tendency to that confluence which uniformly exists in the parts composing the upper valve of the proper envelope, and which takes place also between these two squamæ themselves, in some genera, as *Glyceria* and *Melica*. In certain other genera, as *Bambusa* and *Stipa*, a third squamula exists, which is placed opposite the axis of the upper valve of the proper envelope, or, to speak in conformity with the view already taken of the structure of this valve, opposite to the junction of its two component parts. With these squamæ the stamina in triandrous grasses alternate, and they are consequently opposite to the parts of the proper envelope; that is, one stamen is opposed to the axis of its lower or outer valve, and the two others are placed opposite to the two nerves of the upper valve. Hence, if the inner envelope be considered as consisting of bracteæ and the hypogynous squamæ as forming the perianthium, it seems to follow, from the relation these parts have to the axis of inflorescence that the outer series of this perianthium is wanting, while its corresponding stamina exist, and that the whole or part

of the inner series is produced while its corresponding stamens are generally wanting. This may, no doubt, actually be the case, but as it would be, at least, contrary to every analogy in Monocotyledonous plants, it becomes in a certain degree probable that the inner or proper envelope of grasses, the calyx of Jussieu, notwithstanding the obliquity in the insertion of its valves, forms in reality the outer series of the true perianthium, whose inner series consists of the minute scales, never more than three in number, and in which an irregularity in some degree analogous to that of the outer series generally exists.

It is necessary to be aware of the tendency to suppression existing, as it were, in opposite directions in the two floral envelopes of grasses, to comprehend the real structure of many irregular genera of the order, and also to understand the limits of the two great tribes into which I have proposed to subdivide it.

One of these tribes, which may be called PANICEÆ, comprehends *Ischaënum*, *Holcus*, *Andropogon*, *Anthistiria*, *Saccharum*, *Cenchrus*, *Isachne*, *Panicum*, *Paspalum*, *Reimaria*, *Anthenantia*, *Monachne*, *Lappago*, and several other nearly related genera; and its essential character consists in its having always a locusta of two flowers, of which the lower or outer is uniformly imperfect, being either male or neuter, and then not unfrequently reduced to a single valve.

Ischaënum and *Isachne* are examples of this tribe in its most perfect form, from which form *Anthenantia*, *Paspalum*, and *Reimaria*, most remarkably deviate in consequence of the suppression of certain parts: thus *Anthenantia* (which is not correctly described by Palisot de Beauvois) differs from those species of *Panicum* that have the lower flower neuter and bivalvular, in being deprived of the outer valve of its gluma; *Paspalum* differs from *Anthenantia* in the want of the inner valve of its neuter flower; and from those species of *Panicum*, whose outer flower is univalvular, in the want of the outer valve of its gluma; and *Reimaria* differs from *Paspalum* in being entirely deprived of its gluma. That this is the real structure of these genera may be proved by a series of ess

species connecting them with each other, and *Panicum* with *Paspalum*.

Paniceæ have their maximum within the tropics, and they cease to exist in the most northern parts of Europe and the higher southern latitudes. Of this tribe, 99 species have been observed in Terra Australis, 79 of which were found within the tropic, and of these, 66 only within it. There is no Australian genus of this tribe, *Neurachne* and *Hemarthria* excepted, which is not chiefly intratropical.

The second tribe, which may be called *Poaceæ*, is more numerous than *Paniceæ*, and comprehends the greater part of the European genera, as well as certain less extensive genera peculiar to the equinoctial countries; it extends also to the highest latitudes in which Phænogamous plants have been found, but its maximum appears to be in the temperate climates considerably beyond the tropics. The locusta in this tribe may consist of one, of two, or of many flowers, and the two-flowered genera are distinguished from *Paniceæ* by the outer or lower flower being always perfect; the tendency to imperfection in the locusta existing in opposite directions in the two tribes. In conformity with this tendency in *Poaceæ*, the outer valve of the perianthium in the single-flowered genera is placed within that of the gluma, and in the many-flowered locusta the upper flowers are frequently imperfect. There are, however, some exceptions to this order of suppression, especially in *Arundo* *Phragmites*, *Campulosus*, and some other genera, in which the outer flower is also imperfect, but as all of these have more than two flowers in their locusta, they are still readily distinguished from *Paniceæ*.

In Terra Australis the *Poaceæ* amount to 115 species, of which 69 were observed beyond the tropic and of these 63 only beyond it; but of the 52 species that occur within the tropics 49 belong to genera which are either entirely or chiefly intratropical, and of the remaining three species, two, namely *Arundo* *Phragmites*, and *Agrostis virginica*, are very general and also aquatic plants. The distribution of this tribe, therefore, in Terra Australis agrees with that which obtains in other parts of the world.

FILICES.¹ Of this order nearly 1000 species are described in the fifth volume of Willdenow's edition of the ¹⁸⁰⁴ Species Plantarum. In their geographical distribution, Ferns differ from all the other orders of cryptogamous plants, their maximum being in the lower latitudes, probably near, or very little beyond the tropics. Thus, Norfolk Island, situated in 29° S. lat. and only a few leagues in circumference, produces as many species of the order as are described in Dr. Smith's Flora Britannica.

But as shade and moisture are essential conditions to the vegetation of the greater part of Ferns, few species only have been observed in those parts of equinoctial New Holland hitherto examined. The number of species already found, however, in the different regions of Terra Australis exceeds 100, of which nearly one fourth are also natives of other countries.

Among the Australian Ferns there is no genus absolutely confined to that country, except *Platyzoma*, but this, perhaps, ought not to be separated from *Gleichenia*.

Only two arborescent Ferns have been observed in Terra Australis, one in the colony of Port Jackson, the second, *Dicksonia antarctica*, is frequent in Van Diemen's Island, at the southern extremity of which its trunk is not unfrequently from 12 to 16 feet in height. An arborescent species of the same genus was found by Forster, in New Zealand, at Dusky Bay, in nearly 46° S. the highest latitude in which tree ferns have yet been observed. It is remarkable that, although they have so considerable a range in the southern hemisphere, no tree fern has been found beyond the northern tropic: a distribution in the two hemispheres somewhat similar to this has been already noticed respecting the Orchideæ that are parasitical on trees.

I have formerly, in treating of the New Holland *Asplenia*, observed that *Cænopteris* does not differ from them in the relation its involucra have to the axis of the frond or pinna but merely in having the ultimate pinna more deeply divided, with one, or, at most, two involucra on each segment,

¹ *Prodr. fl. Nov. Holl.* 145.

towards the margins of which they must necessarily open : hence, the characters of both genera not unfrequently occur in the same frond, and are even exhibited by the same involucrum when it happens to extend below the origin of the segment.

I have observed also, in the same place, that in *Asplenium* [65] when the involucrum originates from the inner branch of a primary vein, which is usually the case, it opens inwards or towards the mid-rib of the frond from which the vein is derived ; and that when it arises from the lower or outer branch of a vein it opens outwards, or in an opposite direction, instances of which occur in several species of the genus, in some of those especially where the frond is simple. On the same law also depends the peculiar character of *Scolopendrium*, in which the involucra are produced in pairs, one of each pair originating from the lower branch of a vein, the other from the upper branch of the vein immediately below it ; they consequently open in opposite directions and towards each other. This law, however, in *Asplenium* is only observed where the vein has but few branches, for when these are more numerous, and especially when, in consequence of their greater number, the vein has a manifest trunk or axis, the involucra of all its branches open towards this axis ; the most remarkable instances of this occur in those species of the genus which authors have separated from it, under the name of *Diplazium*, where, however, another peculiarity exists, depending on the same law. This peculiarity consists in the inner branch of the vein, or that adjoining the mid-rib, appearing to have a relation not only to the axis of the vein but to that of the pinna or frond from which the vein originates ; a relation indicated by its having two involucra, one of which bursts towards the axis of the vein, the other towards the adjoining mid-rib. This double involucrum constitutes the character of *Diplazium*, but as it is confined to the inner branch, all the others being simple, and opening towards the axis of the vein, there do not appear to be sufficient grounds for its separation from *Asplenium*. I consider the curved involucrum of *Asplenium Filix-Fæmina*, which

exists only on this inner branch of the vein, as somewhat analogous to the double involucrum of *Diplazium*; but in another point of view it may be regarded as an approach to the structure of *Nephrodium*, to which this plant has been improperly referred.

THERE are some other Australian natural families of ⁵⁸⁶ plants to which, either as containing distinct and peculiar genera, or a considerable number of species, similar remarks might be extended; but I have already exceeded the limits prescribed for the present essay, which I shall therefore conclude with a few general observations, chiefly deduced from the facts previously stated, and with a very slight comparison of the vegetation of Terra Australis with that of other countries.

I have formerly remarked that nearly half the Australian species of plants, at present known, have been collected in a parallel included between 33° and 35° S. latitude; and it appears, from the preceding observations on the several natural orders, that a much greater proportion of the peculiarities of the Australian Flora exist in this, which I have therefore called the *principal parallel*; and that many of them are even nearly confined to it. But these peculiarities exist chiefly at its western and eastern extremities, and are remarkably diminished in that intermediate part which is comprehended between 133° and 138° E. long.

From the principal parallel most of the characteristic tribes diminish in number of species as well as of individuals, not, however, equally in both directions, but in a much greater degree towards the equator. In Van Diemen's Island the same general aspect of vegetation is retained; but of the natural orders forming the peculiar character of the principal parallel several are very much reduced, while none are augmented in numbers; and the only tribes which enter in nearly the same proportion into the composition of

its Flora are *Eucalyptus*, the *Leafless Acaciæ* and, perhaps, *Epacridiæ*. Within the tropic, at least on the East coast, the departure from the Australian character is much more remarkable, and an assimilation nearer to that of India than of any other country takes place. Several of the peculiar orders and extensive genera of the principal parallel are here exceedingly diminished, and none remain in nearly equal proportion except *Eucalyptus* and the *Leafless Acaciæ*.

These two genera are not only the most widely diffused, but, by far the most extensive in Terra Australis, about 100 species of each having been already observed ; and if taken together and considered with respect to the mass of vegetable matter they contain, calculated from the size as well as the number of individuals, are, perhaps, nearly equal to all the other plants of that country. They agree very generally also, though belonging to very different families, in a part of their economy which contributes somewhat to the peculiar character of the Australian forests, namely, in their leaves or the parts performing the functions of leaves being vertical, or presenting their margin, and not either surface, towards the stem ; both surfaces having consequently the same relation to light. This economy, which uniformly takes place in the *Acaciæ*, is in them the result of the vertical dilatation of the foliaceous footstalk ; while in *Eucalyptus*, where, though very general, it is by no means universal, it proceeds from the twisting of the footstalk of the leaf.

The plants of Terra Australis at present known, amounting to 4200, are referable, as has been already stated, to 120 natural orders ; but fully half the number of species belong to eleven orders.

Of these Leguminosæ, Euphorbiaceæ, Compositæ, Orchideæ, Cyperaceæ, Gramineæ, and Filices are most extensive and very general tribes, which are not more numerous in Terra Australis than in many other countries.

Thus Leguminosæ and Compositæ, which taken together comprehend one fourth of the whole of Dicotyledones, and Gramineæ, which alone form an equal part of Monocotyle-

dones, bear nearly the same proportion to these primary divisions in the Australian Flora.

The four remaining orders are Myrtaceæ, Proteaceæ, Restiaceæ, and Epacrideæ. Of these *Myrtaceæ*, though it is likewise very general, has evidently its maximum in Terra Australis, more species having been already observed in that country than in all other parts of the world; *Proteaceæ* and *Restiaceæ*, which are nearly confined to the southern hemisphere, and appear to be most abundant in the principal parallel of New Holland, are also very numerous at the Cape of Good Hope: and *Epacrideæ*, at least, equally limited to the southern hemisphere, are, with very few exceptions, confined to Terra Australis.

Several other less extensive natural families have also their maximum in this country, especially Goodenoviæ, Stylideæ, Myoporinæ, Pittosporæ, Dilleniaceæ, Diosmeæ, and Halorageæ; but the only orders that appear to be absolutely confined to Terra Australis are Tremandreae and Stackhouseæ, both of them very small tribes, which ⁵⁵⁸ many botanists may be disposed to consider rather as genera than separate families.

A great part of the genera of Terra Australis are peculiar to it, and also a considerable number of the species of such of its genera as are found in other countries.

Of the species at present composing its Flora scarcely more than 400, or one tenth of the whole number, have been observed in other parts of the world. More than half of these are Phænogamous plants, of which the greater part are natives of India, and the islands of the southern Pacific; several, however, are European plants, and a few belong even to equinoctial America. Of the Cryptogamous plants the far greater part are natives of Europe.

In comparing very generally the Flora of the principal parallel of Terra Australis with that of South Africa, we find several natural families characteristic of the Australian vegetation, as Proteaceæ, Diosmeæ, Restiaceæ, Polygalæ, and also Buttneriaceæ, if Hermannia and Mahernia be considered as part of this order, existing, and in nearly equal abundance, at the Cape of Good Hope; others are

replaced by analogous families, as Epacridæ by Ericæ; and some tribes which form a considerable part of the Australian peculiarities, as Dilleniaceæ, the leafless Acaciæ and Eucalyptus, are entirely wanting in South Africa.

On the other hand, several of the characteristic South African orders and extensive genera are nearly or entirely wanting in New Holland: thus Iridæ, Mesembryanthemum, Pelargonium, and Oxalis, so abundant at the Cape of Good Hope, occur very sparingly in New Holland, where the South African genera Aloe, Stapelia, Cliffortia, Penæa, and Brunia, do not at all exist. Very few species are common to both countries, and of these the only one which is at the same time peculiar to the Southern hemisphere is *Osmunda barbara*.

We have not sufficient materials for a satisfactory comparison of the Flora of the higher latitudes of South America with that of the Southern parts of Terra Australis. If, however, we may judge from those at present in our possession, it would seem that the general character of the South American vegetation differs much more from the Australian than this does from that of South Africa. Yet several instances occur of the same or of very nearly related genera, ^{559]} peculiar to the southern hemisphere, which are common to Terra Australis and South America, and which do not exist at the Cape of Good Hope. Thus the Pavonia or *Laurelia* of Chili has its nearly related genus *Atherosperma* in Van Diemen's Island; where also a genus that I shall name *Tasmania* occupies the place of the *Wintera* of South America, from which it differs chiefly in having a single ovary; a species of the *Araucaria* of Chili exists in New Holland as well as in Norfolk Island and New Caledonia; several *Lomatia* are found in South America; a species of *Astelia* grows in Terra del Fuego; and *Goodenia littoralis* of the southern shores of Terra Australis is found not only in New Zealand but on the opposite coast of America.

Certain tribes of plants common to South Africa and Terra Australis, and almost equally abundant in both these countries, are either very sparingly produced or cease to exist in South America. Others which abound in South

Africa and are comparatively rare in Terra Australis are in South America entirely wanting ; and I am acquainted with no tribe of plants common to South Africa and South America and at the same time wanting in Terra Australis, unless the Compositæ with bilabiate corolla.

The character of the New Zealand Flora, known to us chiefly from the materials collected by Sir Joseph Banks, is to a considerable degree peculiar ; it has still, however, a certain affinity to those of the two great countries between which it is situated, and approaching rather to that of Terra Australis, than of South America.

In comparing together the Floras of Terra Australis and Europe, I shall chiefly confine myself to an enumeration of the species common to both countries ; the subject at present hardly admitting of many remarks of a more general nature. It may, however, be observed, that none of the great natural orders of Europe are absolutely wanting in Terra Australis ; that some of them, as Compositæ, Leguminosæ, Gramineæ and Cyperaceæ, are found even in nearly the same proportion ; while others, as Cruciferæ, Ranunculaceæ, Caryophylleæ, Rosaceæ, and Ericeæ are reduced to very few species ; and that several of the less extensive European orders, namely, Saxifrageæ, Cistineæ, Berberides, Resedaceæ, Fumariaceæ, Grossularinæ, Valerianeæ, Dipsaceæ, Polemonideæ, Globulariæ, Elæagnæ, and Equisetaceæ in Terra Australis do not at all exist.

The greater number of Australian genera, except the ^[590] Acotyledonous, differ from those of Europe ; there are, however, a few European genera, as Utricularia, Drosera, and Samolus, that appear to have even their maximum in Terra Australis.

From the following list of species, common to Terra Australis and Europe, I have carefully excluded all such as, though now existing in the different settlements, have evidently, or probably, been introduced, and I am satisfied that no naturalised plant will be found in it except, perhaps, *Cynodon Dactylon*.

I have also excluded certain plants, as *Elatine Hydropiper*, *Geum urbanum*, *Oxalis corniculata*, *Lycopus euro-*

pœus, and *Typha angustifolia*, which, though appearing to differ in some respects from those of Europe, are probably not specifically distinct. And if among the Phænogamous plants inserted there be any room for doubt respecting the identity of the Australian and European species, it may possibly be as to *Arenaria marina*, *Zapania nodiflora*, *Atriplex Halimus*, *Potamogeton gramineum*, *Cyperus rotundus* and *Holcus Gryllus*.

The first observation that occurs with regard to this list is, that the relative proportions of the three primary divisions of plants compared with those of the Australian Flora are inverted : for of 2900 Dicotyledones of the Flora only 15 are natives of Europe ; while of 860 Monocotyledones 30, and of 400 Acotyledones upwards of 120 appear in the list.

The Phænogamous plants of the list are, with very few exceptions, also natives of North America, and several of them are found even in other parts of the world.

There is nothing peculiar in the apparent structure or economy of the *Dicotyledonous* plants common to countries so remote to account for their more general diffusion ; though several of them grow in wet or marshy ground, yet very few are properly aquatic plants ; and in the structure of their seeds the only circumstance in which they all agree is in the plumula of their embryo not being evolved.

Of the *Monocotyledones*, on the other hand, a considerable number are aquatic plants ; and the greater part of those that are not aquatic belong to the irregular tribes, supposed to have a simpler structure.

Among the *Acotyledonous* or *Cryptogamous* orders it is [591] remarkable that there should be but a single species of Fern in the list, though those of the Flora exceed 100, of which 28 species are found likewise in other countries. It is also worthy of notice that of the Submersed Algae not more than one sixth of the whole number found occur in the list ; while of the Musci and Hepaticæ one third, and of the Lichenosæ two thirds of those observed are also natives of Europe.

The proportion of European plants in Terra Australis,

though only one twenty-fifth¹ of the whole number observed, appears to be greater than that in the Flora of South Africa. And the vegetation of the Cape of Good Hope, not only in the number of species peculiar to it, but in its general character, as depending on the extensive genera or families of which it is composed, differs almost as widely from that of the northern parts of the same continent, and the south of Europe, as that of the corresponding latitude of Terra Australis does from the Flora of India and of Northern Asia.

Of the proportion of European species in the Flora of South America, which is probably still smaller than that of South Africa, we have very insufficient means of judging; we know, however, from the collections made by Sir Joseph Banks that, at the southern extremity of America, certain European plants, as *Phleum alpinum*, *Alopecurus alpinus*, and *Botrychium Lunaria* exist; and that there is even a considerable resemblance in the general character of the Flora of Terra del Fuego to that of the opposite extremity of America and of the North of Europe.

¹ In the original text the proportion is stated as "one-tenth;" but this obvious mistake was corrected as above, by Mr. Brown—himself in the Banksian copy of 'Flinders's Voyage.' *Edit.*

592] A LIST OF PLANTS, NATIVES BOTH OF TERRA
AUSTRALIS AND OF EUROPE.

DICOTYLEDONES.

POLYPETALÆ.

- Potentilla anserina, *Linn.*
- Aphanes arvensis, *Linn.*
- Lythrum Salicaria, *Linn.*
- Portulaca oleracea, *Linn.*
- Arenaria marina, *Smith brit.* 480.
- Nasturtium amphibium, *Hort. Kew.*
ed. 2, vol. 4, p. 110.
- Hydrocotyle vulgaris, *Linn.*

MONOPETALÆ.

- Sonchus oleraceus, *Linn.*
- Pieris hieracioides, *Linn.*
- Zapania nodiflora, *Prodr.* 514.
- Verbena officinalis, *Linn.*
- Prunella vulgaris, *Linn.*
- Calystegia sepium, *Prodr.* 483.
- Samolus Valerandi, *Linn.*

APETALÆ.

- Atriplex Halimus, *Linn.*

MONOCOTYLEDONES.

HYDROCHARIDÆ.

- Vallisneria spiralis, *Linn.*
- Lemna minor, *Linn.*
- trisulca, *Linn.*

ALISMACEÆ.

- Potamogeton natans, *Linn.*
- perfoliatum, *Linn.*
- crispum, *Linn.*
- gramineum, *Linn.*

- Alisma Plantago, *Linn.*

AROIDEÆ.

- Caulinia oceanica, *Prodr.* 339.
- Zostera marina, *Linn.*

JUNCEÆ.

- Luzula campestris, *Decand. franc.* 3,
p. 161.
- Juncus maritimus, *Smith brit.* 375.
- effusus, *Linn.*

CYPERACEÆ.

- Carex Pseudo-cyperus, *Linn.*
- caespitosa, *Linn.*
- Cladium Mariscus, *Prodr.* 236.
- Scirpus maritimus, *Linn.*
- triquetus, *Linn.*
- mucronatus, *Linn.*
- lacustris, *Linn.*
- Isolepis setacea, *Prodr.* 222.
- fluitans, *Prodr.* 221.
- Cyperus rotundus, *Linn.*

GRAMINEÆ.

- Glyceria fluitans, *Prodr.* 179.
- Arundo Phragmites, *Linn.*
- Cynodon Dactylon, *Prodr.* 187.
- Panicum crus-galli, *Linn.*
- Pennisetum glaucum, *Prodr.* 195.
- Imperata arundinacea, *Prodr.* 204.
- Holcus Gryllus, *Prodr.* 199.

ACOTYLEDONES.

[593]

MARSILEACEÆ.

- Marsilea quadrifolia, *Linn.*

FILICES.

- Hymenophyllum tunbridgense, *Smith
brit.* 1141.

MUSCI.

- Hypnum recognitum, *Hedw. sp. musc.*
261.
- Leskeia complanata, *Hedw. sp. musc.*
231.

Hookeria lucens, *Smith in linn. soc. transact.* 9, p. 275.

Neckera pennata, *Hedw. sp. musc.* 200
— *heteromalla*, *Hedw. sp. musc.* 202.

Bryum capillare, *Hedw. sp. musc.* 182.
— *argenteum*, *Hedw. sp. musc.* 181.

Bartramia pomiformis, *Hedw. sp. musc.* 164.

Funaria hygrometrica, *Hedw. sp. musc.* 172.

Barbula unguiculata, *Hedw. sp. musc.* 118.

Trichostomum canescens, *Hedw. sp. musc.* 111.
— *polyphyllum*, *Hedw. suppl.* 153.

Cynodontium capillaceum, *Hedw. sp. musc.* 57.

Fissidens exilis, *Hedw. sp. musc.* 152.

Dicranum purpureum, *Hedw. sp. musc.* 136.

— *flexuosum*, *Hedw. sp. musc.* 145?

— *scoparium*, *Hedw. sp. musc.* 126.

Encalypta vulgaris, *Hedw. sp. musc.* 60.

Weisia controversa, *Hedw. sp. musc.* 67.

Grimmia pulvinata. *Dicranum pulvinatum*, *Hedw. suppl.* 1, p. 189.

— *apocarpa*, *Hedw. sp. musc.* 76.

Gymnostomum pyriforme, *Hedw. sp. musc.* 38.

Anictangium ciliatum, *Hedw. sp. musc.* 40.

Phascum muticum, *Hedw. sp. musc.* 25.

Sphagnum capillifolium, *Hedw. sp. musc.* 25.

HEPATICÆ.

Jungermannia tomentella, *Hooker junger.* 36.

— *tamarisci*, *Linn.*
— *complanata*, *Linn.*
— *bidentata*, *Linn.*
— *pinguis*, *Linn.*
— *byssacea*, *Hooker junger.* 12.
— *furcata*, *Linn.*

Targionia hypophylla, *Linn.*

Marchantia polymorpha, *Linn.*

— *hemisphaerica*, *Linn.*

Anthoceros punctatus, *Linn.*

Riccia glauca, *Linn.*

— *natans*, *Linn.*

— *fluitans*, *Linn.*

LICHENOSÆ.

Lecidea geographica, *Achar. lichenogr.* 163.

— *confluens*, *Achar. loc. cit.* 174.

— *parasema*, *loc. cit.* 175.

— *luteola*, *loc. cit.* 195.

— *lurida*, *loc. cit.* 219.

Gyrophora polyphylla. *G. heteroidea*, β , *loc. cit.* 219.

Calicium clavicular, *loc. cit.* 235.

— *proboscidea*, *loc. cit.* 220.

Verrucaria nitida, *loc. cit.* 279.

Endocarpus hepaticum, *loc. cit.* 298.

Thelotrema lepadinum, *loc. cit.* 312.

Lecanora atra, *loc. cit.* 344.

— *fusco-atra*, *loc. cit.* 359.

— β *dendritica*, *loc. cit.*

— *parella*, *loc. cit.* 370.

— *subfuscata*, *loc. cit.* 393.

— *ventosa*, *loc. cit.* 399.

— *sulphurea*, *loc. cit.* 399.

— *decipiens*, *loc. cit.* 409.

— *lepidosa*, *loc. cit.* 417.

— *microphylla*, *loc. cit.* 420.

— *gelida*, *loc. cit.* 428.

— *lentigera*, *loc. cit.* 423.

— *brunnea* β *nebulosa*, *loc. cit.*

419.

Roecella fuciformis, *loc. cit.* 440.

Evernia prunastri, *loc. cit.* 442.

Sticta crocata, *loc. cit.* 447.

— *pulmonacea*, *loc. cit.* 449?

— *serobiculata*, *loc. cit.* 453.

Parmelia caperata, *loc. cit.* 457.

— *olivacea*, *loc. cit.* 462.

— *parietina*, *loc. cit.* 463.

— *plumbea*, *loc. cit.* 466.

— *stellaris*, *loc. cit.* 476.

— *conspersa*, *loc. cit.* 486.

— *physodes*, *loc. cit.* 492.

Peltidea canina, *loc. cit.* 517.

Cenomyce pyxidata, *loc. cit.* 534.

— *coccifera*, *loc. cit.* 537.

— *deformis*, *loc. cit.* 538. [594]

— *cornuta*, *loc. cit.* 545.

— *rangiferina*, *loc. cit.* 564.

— *vermicularis*, *loc. cit.* 566.

Stereocaulon paschalis, *loc. cit.* 581.
Sphærophoron coralloides, *loc. cit.* 585.
 — *compressum*, *loc. cit.* 586.

Ramalina fraxinea, *loc. cit.* 602.
 — *fastigiata*, *loc. cit.* 602.
Cornicularia spadicea, *loc. cit.* 611.
 — *lanata*, *loc. cit.* 615.
 — *pubescens*, *loc. cit.* 616.

Usnea florida, *loc. cit.* 620.

Collema nigrum, *loc. cit.* 628.
 — *fasciculare*, *loc. cit.* 639.
 — *tremelloides*, *loc. cit.* 655.
Lepraria flava, *loc. cit.* 663.
 — *incana*, *loc. cit.* 665.
 — *botryoides*, *Achar. meth.* 6.

FUNGI.

Rhizomorpha setiformis, *Pers. syn. fung.* 705.
Tuberularia vulgaris, *Pers. syn. fung.* 112.
Sphaeria ophioglossoides, *Pers. syn. fung.* 4.
Clavaria pistillaris, *Linn.*
 — *coralloides*, *Linn.*
Peziza scutellata, *Linn.*

Boletus igniarius, *Linn.*
Agaricus alneus, *Linn.*
 — *muscarius*, *Linn.*
 — *campestris*, *Linn.*

ALGÆ.

Conferv a ebenea, *Dillwyn brit. conf.* 101.
 — *ericetorum*, *Dillwyn brit. conf.* 1.
Ulva plumosa, *Huds. ang.* 571.
 — *lactua*, *Linn.*
Fucus articulatus, *Turner fuci* 2, *p.* 93,
t. 106.
 — *obtusus*, *Turner fuci* 1, *p.* 44,
t. 21.
 — *pinnatifidus*, *Turner fuci* 1, *p.* 40,
t. 20.
 — *corneus*, *Eng. bot.* 1970.
 — *plicatus*, *Turner fuci* 3, *p.* 107,
t. 180.
 — *palmatus*, *Turner fuci*, *p.* 117,
t. 115.
 — *rubens*, *Turner fuci* 1, *p.* 89, *t.* 42.
 — *sinuosus*, *Turner fuci* 1, *p.* 74,
t. 35.

DESCRIPTIONS OF PLANTS FIGURED⁵⁹⁵ IN THE ATLAS.

FLINDERSIA.

Ord. Nat. *Cedreleæ*.

Syst. Linn. *Pentandria Monogynia*, inter *Cedrelam* et *Calodendrum*.

CHAR. GEN. *Stamina* decem, dorso urceoli hypogyni inserta : alterna sterilia. *Capsula* 5-partibilis ; segmentis singulis divisus *dissepimento* longitudinali, demum libero, utrinque dispermo. *Semina* erecta, apice alata.

FLINDERSIA AUSTRALIS. *Tab. 1.*

A tree of moderate size, observed September, 1802, both in flower and with ripe capsules, in the woods and thickets near the head of Broad Sound, on the east coast of New Holland, in about 23° S. lat. The examination of Broad Sound was completed at the same time by Captain Flinders, to commemorate whose merits I have selected this genus from the considerable number discovered in the expedition, of which he was the able and active commander.

DESC. *Arbor*, trunco pro ratione altitudinis mediocris crasso, coma irregulare, ramis patulis, ramulis teretibus umbellatis cortice fusco cinereo rugoso, gemmis foliorum apicibusque ramulorum gummiferis. *Folia* alterna, ad apicem ramuli conferta, exstipulata, petiolata, composita, ternata vel cum impari opposito-pinnata 2-3-juga ; *foliola* oblongo-elliptica (in ramulis sterilibus quandoque lanceolata), integrerrima glaberrima plana pellucido-punctata, dum 2-3 uncias longa 12-15 lineas lata. *Petiolum* communis angulatus mediocris : partialium laterales brevissimi, terminalis foliorum inferiorum 3-4 lineas aequans. *Panicula* terminales confertæ, ramis ramulisque alternis patentibus, pubescentibus instructis ; *bracteis* parvis subulatis. *Flores* parvi albi, odore debili haud ingrato. *Calyx* brevis 5-fidus, extus pubescens, laciniis aequalibus semiiovatis acutis, persistens. *Petala* 5 sessilia oblongo-ovata obtusa plana, extus tenuissime pubescentia, basi disci staminiferi inserta, aestivatione imbricata. *Stamina* decem, infra apicem extus disci hypogyni inserta, petalis breviora. *Filamenta* ⁵⁹⁶ 5 antherifera cum petalis alternantia, prope basin disci inserta ; 5 sterilia petalis opposita, breviora, in disco paulo altius imposta : omnia glabra compresso-filiformia conniventia ; *Anthereæ* conniventes ovato-cordatae acuminatae glabrae flavicantes, juxta basin affixæ, loculis appositis longitudinaliter dehiscentibus : *Pollen* flavum globosum laeve. *Discus hypogynus* ovarium laxè circumdans.

brevis glaber cyathiformis decemplicatus subcrenatus. *Ovarium* liberum sessile depresso-globosum viride, tuberculis confertissimis obtusis undique tectum, villisque rarioribus tenuibus pubescens, 5-loculare; *Stylus* simplex erectus glaber obtusè 5-gonus; *Stigma* peltatum altè 5-lobum. *Capsula* lignea oblonga obtusa fere 3-uncialis, basi calyce minimo persistenti subtensa, undique echinata processibus suberoso-ligneis confertis subconicis, 5-partibilis, segmentis cymbiformibus, tandem ab apice semibifidis et siccatione saepe transversim fissis, basibus ante dehiscentiam adnexis axi centrali brevi demum libero et persistenti. *Placenta* centralis longitudinaliter alte 5-loba, efformans *Dissepimenta* quinque longitudine capsulae, cum segmentis alternantibus ideoque eorum cavitates bipartientia, ante dehiscentiam margine interiore connexa, demum soluta, dimidiato-oblonga plana spongioso-lignea, versus dorsum obtusum sensim crassiora, margine interiore in aciem attenuata, utrinque disperma, et insignita lineis duabus alternis a margine interiore arcuatim descendantibus et paulo intra dorsum desinentibus. *Semina* erecta, funiculo brevi compresso paulo supra basin marginis exterioris inserta, plano-convexa, apice in alam membranaceam planam uninervem ipso nucleo subovato sesquilociorem desinentia. *Integumentum* simplex coriaceum basi lateribusque spongioso-incrassatis. *Albumen* nullum. *Embryo* dicotyledoneus albus; *Cotyledones* transverse crasso-foliaceæ aveniae; *Radicula* prope medium marginis interioris seminis transversa, brevissima, sinn baseos cotyledonum inclusa, ab umbilico remota.

Obs. There can be very little doubt that *Arbor Radulifera* of the Herbarium amboinense (3, p. 201, t. 129,) belongs to Flindersia, not only from the external appearance of the capsule as exhibited in the figure, but from the description given by Rumpf of its dehiscence, as well as of the peculiar dissepiments and the structure of the seeds.

The affinities of this genus are not perhaps very evident. I have referred it to *Cedreleæ*, an order certain genera of which are annexed by Jussieu to *Meliaceæ*, but which I have separated from that family chiefly on account of the structure of the fruit, and of the winged seeds. Flindersia, however, does not agree with the other genera of *Cedreleæ* either in the insertion of its seeds or dehiscence of its capsule; and it appears to differ from them remarkably in its moveable dissepiments; but these may be considered as the segments of a common placenta, having a peculiar form, indeed, but not being in other respects essentially different from that of *Cedreleæ*. Flindersia is distinct also from the whole of the order, in having its leaves dotted with pellucid glands, in which respect it seems to connect *Cedreleæ* with *Hesperideæ*; and, notwithstanding the absence of albumen, even with *Diosmeæ*.

EUPOMATIA.

Ord. Nat. *Annonaceæ*!Syst. Linn. *Icosandria Polygynia*, v. *Monadelphus Polyandria*.

CHAR. GEN. *Operculum* superum integerrimum deciduum (integumentis floralibus præterea nullis). *Stamina* numerosa : *exteriora* antherifera : *interiora* sterilia petaloidea imbricata. *Ovarium* multiloculare, loculis indefinitis (numero et ordine), polyspermis. *Stigmata*; areolæ tot quot loculi, in apice planiusculo ovarii. *Bacca* polysperma.

EUPOMATIA LAURINA. Tab. 2.

In woods and thickets in the colony of Port Jackson, especially in the mountainous districts, and on the banks of the principal rivers; flowering in December and January.

DESC. *Frutex* erectus ramosus glaberrimus 5-10 pedes altus, trunco gracili, ramulis teretibus subporrectis. *Folia* alterna, in ramulis bifaria, petiolata exstipulata, impunctata coriacea utrinque nitida nigro-viridia, integerrima plana oblonga acumine brevi, basi acuta aequali, dum 5 uncias longa sesquiunciam lata. *Pedunculi* axillares, uniflori folio breviores ramuliformes, foliis 3-4 alternis nanis instructi. *Perianthium* superum, limbo juxta basim transversim dehiscente: *Opérculo* caduco semielliptico, paulo ante dehiscentiam albo-virescenti, e calyce et corolla concretis forsan conflato. *Stamina* margine persistenti limbi perianthii inserta, multiplici serie, basibus connatis; *exteriora* antherifera numerosa patula vel arctè reflexa; *Filamentis* e basi dilatata subulatis; *Antheris* ochroleucis linearibus, adnatis apice filamenti in mucronulum ultra producti, bilocularibus longitudinaliter dehiscentibus; *Polline* globoso lœvi; *interiora* sterilia petaloidea, arcte imbricata multiplici serie, basi invicem et antheriferis connexa simulque decidua, interioribus sensim minoribus arctiusque imbricatis. *Ovarium* turbinatum multiloculare, loculis sparsis nec verticillatis, polyspermis, ovulis ellipticis angulo interiori loculi insertis. *Stigma* sessile planiusculum integrum, areolis subrotundis numero loculorum notatum. *Bacca* turbinato-ovovata glabra, basi angusta limbi persistentis perianthii coronata, apice truncata areolata. *Semina* solitariè vel quandoque geminatim inclusa cellulis clausis, mutua pressione varie angulata, circumscriptione subovata [598] glabra impresso-punctata, altera extremitate, sèpius obtusiore, affixa; chorda ventrali ab umbilico parvo ducta ad extremitatem oppositam ibique in chalazam integumento interiori adnatam desinente; *Integumentum* duplex; *exterius* membranaceum intus undique emittens processus breves inter rugas albuminis demissos, et secundum chordam ventrali processum continuum altiorenum nuculum semibipartientem; *interius* tenuissimum albumine arctissime adnatum: *Albumen* semini conforme carnosum lobatum. *Embryo* in regione umbilici, albumine 5-6ies brevior, dicotyledoneus albicans: *Cotyledones* lineares foliacæ: *Radicula* teres recta longitudine cotyledonum.

Obs. This genus forms a very unexpected addition to *Annonaceæ*, of which it will constitute a distinct section, remarkable in the manifestly perigynous insertion of its stamens and the cohesion of the tube of its calyx with the ovary. It has therefore nearly the same relation to the other genera of the order that *Nymphaea* has to *Hydropeplis*: and the affinity in both cases is chiefly determined by the structure of the seed.

The operculum of *Eupomatiæ*, in which there is no mark of longitudinal division, may be considered as formed either of the calyx alone, or of the confluent calyx and corolla, as appears to be the case at least in several species of *Eucalyptus*.

A singular part of the structure of *Eupomatiæ* consists in its internal, barren, petal-like stamens, which, from their number and disposition, completely cut off all communication between the antheræ and stigmata. This communication appears to be restored by certain minute insects eating the petal-like filaments, while the antheriferous stamens, which are either expanded or reflected, and appear to be even slightly irritable, remain untouched. I have at least not unfrequently seen the barren stamens removed in this way, and, as all the stamens are firmly connected at the base and fall off together, it is difficult to conceive any other mode of exposing the stigmata to the influence of the antheræ.

599]

EUDESMIA.

Ord. Nat. *Myrtaceæ*, inter *Eucalyptum* et *Angophoram*.
Syst. Linn. *Polyadelphia Polyandria*.

CHAR. GEN. *Calyx* superus, 4-dentatus. *Petala* arcte connata in *Operculum* 4-striatum deciduum. *Stamina* in phalanges quatuor polyandras, cum dentibus calycis alternantes, basi connata. *Capsula* 4-loc. polysperma, apice delicens.

EUDESMEA TETRAGONA. Tab. 3.

In exposed barren places near the shores, in the neighbourhood of Lucky Bay, on the south coast of New Holland in 34° S. lat. and 123° E. lon.; gathered both in flower and fruit in January, 1802.

DESC. *Frutex* 3-5 pedes altus, ramis patentibus, ramulis 4-gonis angulis marginatis. *Folia* opposita quandoque subopposita, petiolata, sæpius aversa, lanceolata vel oblonga, coriacea compacta, integerrima marginata glauca resinoso-punctata, venis vix emersis anastomozantibus, 3-4 uncias longa, 14-16 lineas lata. *Umbellæ* laterales paucifloræ, pedunculo pedicellisque ancipitibus. *Calyx* turbinatus obtuse 4-gonus cum ovario cohærens, angulis apice productis in dentes breves subinæquales, duobus oppositis paulo majoribus. *Operculum* depresso-hemisphæricum muticum glandulosum albicans, striis quatuor cruciatis parum depressis dentibus calycis oppositis notatum, quasi e petalis quatuor conflatum, caducum. *Stamina* plurima; *Filamenta* in phalanges quatuor petalis oppositis approximata, capillaria glabra alba, interiora sensim breviora; *Antheræ* ovato-subrotundæ incumbentes ochroleucæ, loculis longitudinæliter deliscentibus. *Ovarium* inclusum tubo adherenti calycis, 4-loculare: *Stylus* 1, cylindraceus; *Sigma* obtusum. *Capsula* inclusa et connata tubo aucto turbinato oblongo ligneo calycis, apice 4-fariam delicens.

OBS. There can be no doubt respecting the affinity of this genus, which belongs to Myrtaceæ and differs from *Eucalyptus* solely in having a striated operculum placed within a distinctly toothed calyx, and in its filaments being collected into bundles. The operculum in *Eudesmia*, from the nature of its striæ and their relation to the teeth of the calyx, appears to be formed of the confluent petals only; whereas, that of *Eucalyptus*, which is neither striated nor placed within a distinct calyx, is more probably composed, in several cases at least, of both floral envelopes united. But in many species of *Eucalyptus* a double operculum has been observed; in these the outer operculum, which generally separates at a much earlier stage, may, perhaps, be considered as formed of the calyx, and [600] the inner consequently of corolla alone, as in *Eudesmia*: this view of the structure appears at least very probable in contemplating *Eucalyptus globulus*, in which the cicatrix caused by the separation of the outer operculum is particularly obvious, and in which also the inner operculum is of an evidently different form.

Jussieu, in some observations which he has lately made on this subject, (*in Annales du mus.* 19. p. 432,) seems inclined to consider the operculum of *Eucalyptus* as

formed of two confluent bracteæ, as is certainly the case with respect to the calyptre of *Pileanthus*, and of a nearly related genus of the same natural family. This account of its origin in *Eucalyptus*, however, is hardly consistent with the usual umbellate inflorescence of that genus; the pedicelli of an umbel being always destitute of bracteæ; and in *Eucalyptus globulus*, where the flowers are solitary, two distinct bracteæ are present as well as a double operculum. But a calyptre analogous to that of *Pileanthus* exists also in most of the species of *Eucalyptus*, where it is formed of the confluent bracteæ common to the whole umbel, and falls off at a very early period.

CEPHALOTUS.

Ord. Nat. *Rosaceæ*.

Syst. Linn. *Dodecandra Hexagynia*.

CHAR. GEN. *Calyx* coloratus, 6-fidus, æstivatione valvata. *Petala* 0. *Stam.* 12, perigyna: *Antherarum* dorso glanduloso. *Ovaria* 6, distincta, monosperma, ovulo erecto. *Styli* terminales.

CEPHALOTUS FOLLICULARIS. *Tab. 4.*

Cephalotus follicularis. *Labillard. nov. holl.* 2, p. 7, t. 145.

In marshy ground, in the neighbourhood of King George's Sound, especially near the shores of Princess Royal Harbour, in 35° S. lat. and 118° E. long.; beginning to flower about the end of December.

DESC. *Herba* perennis. *Caulis* abbreviatus vix uncialis, demersus sæpe sub terram divisus. *Folia* in apice vix emerso caulis conferta quasi radicalia, numerosa petiolata, exstipulata, elliptica, integerrima, enervia crassiuscula plana glabra pilisve raris instructa, viridia, 8-16 lineas longa. *Petiolus* folio vix brevior, semiteres basi parum dilatata.

Ascidia foliis intermista, petiolisque similibus porrectis parumve deflexis insidentia, in orbem circa folia digesta, respectu petioli dependentia, quoad pro-
601 priam cavitatem erecta, subovata, operculata, uncialia; *Extus* ornata costis tribus ab ore cristato ortis, valde elevatis et sepius apice longitudinaliter depresso latiusculo marginibus acutis pilosis; *lateralibus* obliquis dorsum versus tendentibus sensim declinantibus et prope medium lateris desinentibus in lineas cursum oblique anticum servantis pauloque supra basin ventris coalescentes; *ventrali* elevatiore recta, longitudine ascidiæ, apice semper latiusque depresso: *Intus* nitentia et e majore parte nigro-purpurea, paulo infra annulum costatum

oris aucta margine prominulo integerrimo. *Ore* plusquam semiorbiculares, paulo infra marginem extus cincto annulo tenui, ortum præbente processibus numerosis (19-23), parallelis costæfornibus, adnatis, extremitate interiore soluta brevi incurva acuta. *Opereculo* e petiolo derivato et postieo lateri oris ascidii lata basi inserto, foliaceo orbiculato-ovato emarginato planiusculo viridi, venis nigro-purpureis latis ramosis apice anastomozantibus pecto, extus pilosissculo intus glabro.

Scapus simplicissimus erectus pedalis sesquipedalis villosus pilis simplicibus acutis, instructus bracteis nonnullis alternis remotis deciduis; dimidio inferiore quandoque angulato, superiore semper tereti. *Spica* terminalis erecta biuncialis, composita spiculis numerosis, superioribus confertis, inferioribus sensim remotioribus, omnibus pedunculatis 4-5-floris, floribus subcorymbosis ebracteatis. *Bractæ* pedunculos spicularum subtendentes subulato-lincares deciduae. *Flores* parvi. *Calyx* albus, altè 6-sfidus simplici serie, regularis æqualis, extus pube adpressa simplici, laciniis ovato-lanceolatis patulis apice denticulo interiore auctis; basi intus incrassata pilisque capitatis brevissimis hispidula. *Slamina* margini tubi calycis inserta, ejusdem laciniis breviora; sex laciniis alternantia longiora et præcoeciora; *Filamenta* subulata erecto-conniventia glabra purpurascenscentia: *Antheræ* connientes subrotundæ didymæ, lobis appositis purpurascenscentibus longitudinaliter dehiscentibus, connectivo subgloboso fungoso celluloso albo adnatis: *Pollen* flavum. *Pistilla* 6 approximata, staminibus minoribus breviora; *Ovaria* cum laciniis perianthii alternantia subovata parum compressa glabra, margine ventrali truncato dorsali rotundato, monosperma; *Ovulo* erecto, magnitudine fere loculi et intra testam membranaceam continente sacculum magnitudine cavitatis testæ, pendulum: *Styli* terminales teretiusculi: *Stigmata* simplicia. *Fasciculus* laxus albus villorum centrum receptaculi intra ovaria occupat.

Obs. *Cephalotus* has been referred by its discoverer Labillardière to Rosaceæ, to which, notwithstanding its coloured calyx and the absence of petals, it seems to have the nearest affinity; a knowledge of the fruit, however, is wanting to determine absolutely its place in the natural method. From the structure of its ovulum, even in the unimpregnated state, I entertain no doubt that the radicle of the embryo points to the umbilicus of the seed and therefore downwards; a circumstance in which it would differ from the greater part, but not from all the [602] Rosaceæ; and in other respects it does not appear to belong to any subdivision of that order hitherto proposed.

In the structure of its ascidia it agrees with Nepenthes, with which, however, it has no other point of resemblance.

The ascidia or pitchers of *Cephalotus* were observed to be in general nearly half filled with a watery fluid, in which great numbers of a small species of Ant were frequently found drowned. This fluid, which had a slightly sweet taste, may possibly be in part a secretion of

the pitcher itself, but more probably consists merely of rain-water received and preserved in it. The lid of the pitcher in the full grown state was found either accurately closing its mouth or having an erect position and therefore leaving it entirely open; and it is not unlikely that the position of the lid is determined by the state of the atmosphere, or even by other external causes.

ANTIARIS.

Ord. Nat. *Urticeæ*, inter *Brosimum* et *Olmedium*.
Syst. Linn. *Monocia Tetrandra*.

CHAR. GEN. MASC. *Involucrum* multiflorum, basi orbiculata florifera, apice multifido. *Calyx* 4-ph. *Stam.* 4.

FEM. *Involucrum* uniflorum, urceolatum, apice multifidum. *Calyx* 0. *Ovarium* cum involucro cohærens, monospermum, ovulo pendulo. *Stylus* bipartitus. *Drupa* ex involucro aucto formata. *Semen* exalbuminosum. *Embryonis* radicula supera.

ANTIARIS MACROPHYLLA. Tab. 5.

A shrub or very small tree observed in barren stony places, on the shores of the Company's Islands, adjacent to Arnhem's Land, on the north coast of New Holland, in about 12° S. lat.; bearing both flowers and ripe fruit in February, 1803.

DESC. *Frutex* orgyalis ramosissimus glaber lactescens. *Ramuli* teretes. *Folia* alterna, petiolata, stipulata, oblonga cum brevi acumine, basi inaequali subcordata, glaberrima integerrima coriacea, supra nigro-viridia nitida subtus viridiiora, venis fere rectangulis juxta marginem anastomozantibus, venulis 603] divaricatis, dum sex uncias longa ultra tres uncias lata. *Petio* teretiusculi cinerascentes semunciales. *Stipula* intrafoliacea conduplicata lanceolata acuminata foliacea. *Pedunculi* axillares solitarii, brevissimi, androgyni, pedicellis 6-8 alternis, infimo femineo praecociore, reliquis masculis. MASC. *Involucrum* subcyathiforme apice multifido, laciiniis imbricatis acutis ciliatis conniventibus, demum expansum orbiculare marginibus reflexis, diametro quinquelinear. *Flosculi* numerosi densè conferti sessiles. *Calyx* 4-ph. foliolis subspathulatis apice conniventibus. *Corolla* 0. *Antheræ* biloculares: *Pollen* album. Nullum rudimentum pistilli. FEM. *Involucrum* uniflorum ovatum parvum glabrum viride apice multifidum, laciiniis numerosis lanceolatis ciliatis conniventibus, nonnullisque dorsalibus sparsis similibus. *Calyx* 0. *Stamina* 0. *Ovarium* accretum et inclusum ventre involueri, monospermum, ovulo pendulo: *Stylus*

profundè bifidus, lacinii filiformibus elongatis albicantibus glabris; *Stigmata* acuta. *Drupa* ex involuero aucto efformata, ovalis glabra, magnitudine pruni domestici minoris, nigro-sanguinea, substantia carnosa crassa lactescente intus flavicante, lacte albo; *putamine* ovato crustaceo tenaci lœvi fusco. *Integumentum seminis* præter putamen nullum. *Albumen* nullum. *Embryo* dicotyledoneus albus: *Cotyledones* maximæ amygdalino-carnosæ ovatæ plano-convexæ: *Radicula* supera brevissima.

Obs. When I collected and described this plant on the north coast of New Holland, I had no reason to suppose it had any affinity to the *Upas Antiar* or Poison tree of Java, of which the first satisfactory account has been since published by Mr. Leschenault. There can however be no doubt that the plant of New Holland belongs to the same genus with *Antiaris toxicaria* of that author,¹ notwithstanding some difference between our accounts of the structure of the male flowers; with respect to which I have only to observe that my description was taken from living plants, and I consider its correctness to be very much confirmed by the figure, which was afterwards made from dried specimens, by Mr. Bauer, who was unacquainted with my observations. *Antiaris* evidently belongs to Urticeæ, and in a natural series will stand between *Brosimum* of Swartz and *Olmedia* of Flora Peruviana, agreeing with the latter in the structure of its male flowers, and more nearly resembling the former in its female flowers and fruit.

FRANKLANDIA.

[604]

Ord. Nat. *Proteaceæ*.
Syst. Linn. *Tetrandria Monogynia*.

CHAR. GEN. *Perianthium* hypocrateriforme: *limbo* quadripartito deciduo, æstivatione induplicata: *tubo* persistenti. *Anthereæ* inclusæ, perianthio accretæ. *Squamæ* 4, perigynæ, in vaginam 4-fidam connatae. *Ovarium* monospermum. *Caryopsis* fusiformis pedicellata, apice dilatato papposo.

¹ *Annales du mus.* 16, p. 478, t. 22.

FRANKLANDIA FUCIFOLIA. Tab. 6.

Franklandia fucifolia, Linn. soc. transact. 10, p. 157. Prodr. fl. nov. holl. 370.

In moist heaths near the shores of King George's Sound, on the south west coast of New Holland, found in flower and with ripe seed in December, 1801.

DESC. *Frutex* erectus ramosus 2-3 pedes altus glaber, glandulis pustuliformibus aurantiacis undique conspersus. *Rami* teretes striati, epidermide tenui cinerea. *Folia* alterna triuncialia filiformia, basi per spatum semunciale indivisa, dein dichotoma, laciniarum apicibus fastigiatis, ultimæ dichotomie ramulo altero bifido altero simplici. *Spicæ* axillares solitariae simplicissimæ rarae pedunculatae erectæ, foliis parum longiores: *pedicellis* alternis basi unibracteatis; *bractea* ovata obtusa concava sesquilineam longa, post lapsum perianthii fructiferi persistenti. *Perianthium* luteum fere biunciale, extus conspersum pustulis rufescensibus: *Ungues* in tubum cylindraceum cohærentes, extra medium pappo caryopsis expandenti solubiles et decidui; inferne arctius connati indurati persistentes: *Laminæ* tubo breviores, æquales lanceolatæ, disco plano, marginibus adscendentibus parum undulatis vividiisque coloratis, sub aestivatione induplicatis. *Stamina* 4, inclusa, antherarum apicibus faucem semi-claudentibus: *Filamenta* medio tubo perianthii quasi inserta, laciñiis opposita et iisdem longitudinaliter arce cohærentia: *Antheræ* lineares dimidio superiore filamenti in mucronulum ultro producti adnatæ, loculis appositis longitudinaliter deliquescentibus: *Pollen* flavum subglobosum obsoletissimè trigonum læve. *Vaginula* dimidio inferiore tubi perianthii arctissime adnata, ita ut quasi ad eandem altitudinem ac filamenta inserta, supernè soluta quadridentata, demum increasentem caryopsis quadrifida, laciñiis subulato-linearibus cum staminibus alternantibus. *Ovarium* teretiusculum, monospermum: dimidio inferiore barbato pilis strictis copiosis, tenuiore et in pedicellum sensim angustato: superiore fusiformi glabro striato: apice coronatum *Pappo* sessili capillari e pilis strictis acutis formato, ipsum ovarium aliquoties superante. *Stylus* filiformis erectus altitudine staminum lanatus apice glabro. *Stigma* [605] turbinatum indivisum glabrum, apice depresso. *Caryopsis* crustacea, dimidio inferiore persistenti indurato tubi perianthii inclusa, striata apice dilatata in vaginulam brevem subcyathiformem extus pappigeram intus glabram. *Semen* fusiforme, membrana propria tenuissima apice chalaza fusca insignita. *Albumen* nullum. *Embryo* erectus subcylindraceus albus; *Cotyledones* brevissimæ semiorbiculatae; *Radicula* maxima elongato-turbinata teres acuta; *Plumula* inconspicua.

Obs. Franklandia, though evidently belonging to Proteaceæ, differs from the whole of that family in at least three points of structure, any one of which may equally be assumed as the essential character of the genus; namely, in the antheræ being fixed through their whole length to the laciñiæ of the perianthium; in the squamæ which alternate with the stamina so intimately cohering at their base with the lower half of the calyx that they appear to

originate from its upper part; and in the induplicate aestivation of the laminæ of the hypocrateriform perianthium. In this last respect the genus presents an exception to what I had formerly considered as one of the most constant distinguishing characters of the order; it does not, however, so materially invalidate this character as a change to any other kind of aestivation would have done; the induplicate and valvular modes passing into each other, merely by an abstraction or addition of the elevated margins of the laciniae. Instances of the abstraction of these elevated margins, in orders where they are generally present, are met with in Goodenoviae and Convolvulaceæ, and an instance of their addition as in Franklandia occurs, though less obviously, in Chuquiraga, a genus belonging to Compositæ, in which family the valvular aestivation is as general as in Proteaceæ.

The aestivation of Franklandia may be adduced in support of that opinion which considers the floral envelope of Proteaceæ as corolla rather than calyx; there being, I believe, no instance of a similar aestivation in a genuine calyx, unless that of Nyctagineæ be regarded as such: but a stronger argument for this envelope being really calyx is afforded also by Franklandia, in which the transition from the footstalk to the perianthium is so gradual as to be externally imperceptible, and is not marked either by any change or interruption of the surface.

The apparently similar origin in Franklandia of the stamina and squamæ affords an argument, in addition to what I had formerly stated,¹ for considering the latter as [606] barren filaments; we may, therefore, expect to find octandrous genera belonging to this family. While the persistence and induration of the lower half of the perianthium in this genus, and the perigynous origin of the squamæ, which in other genera of the order are hypogynous, render it not improbable that plants may hereafter be discovered having a calyx absolutely cohering with the ovary, which nevertheless it may be necessary to refer to Proteaceæ.

¹ *Linn. soc. transact. 10. p. 159.*

Elæagneæ, in which the tendency to cohesion of the calyx and ovarium is still more obvious than in *Franklandia*, approach very near to *Proteaceæ* in most respects, and the single difference in fructification between these two orders, consisting in the stamina being opposite to the laciniae of the calyx in the latter and alternating with them in the former, is not an insuperable objection to their union; for *Drapetes*, which evidently belongs to *Thymeleæ*, has, in opposition to the rest of that order, its stamina alternating with the divisions of the perianthium.

SYNAPHEA.

Ord. Nat. *Proteaceæ*.

Syst. Linn. *Triandria Monogynia*.

CHAR. GEN. *Perianthium* tubulosum, 4-fidum, ringens.

Antheræ tres, inclusæ : *inferior* didyma cum lateribus dimidiatis primo cohærens in vaginam bilocularem, lobis proximis vicinarum loculum unicum constituentibus. *Stigma* filamento superiore sterili connatum. *Nux*.

SYNAPHEA DILATATA. Tab. 7.

Synaphea foliis apice dilatatis trilobis : lobis inciso-dentatis, petiolis spicisque villosis, stigmate bicorni. *Lin. soc. transact.* 10, p. 156. *Prodr. fl. nov. holl.* 370.

Conospermum reticulatum. *Smith in Rees Cyclopæd.*

In exposed barren situations, near the shores of King George's Sound; gathered in flower and fruit, in December, 1801.

DESC. *Fruticulus* procumbens teres crassitie pennæ corvinæ, subramosus, villis patulis mollibus tomentoque appresso cinereus. *Folia* alterna, elongato-petiolata, adscendentia, cuneata, basi valde attenuata, apice dilatata trifido, lobis (607) incisis, segmentis brevibus acutis mucronulo sphacelato; trinervia, nervis lateralibus margini approximatis simplicissimis et infra apicem folii desinentibus, nec in lacinulas extimas productis; medio trifido, ramis lateralibus subalternis; utrinque pulchrè reticulata, areolis minutis subtus magis conspicuis; adulta glabrata, novella villosa. *Petioli* teretes, basi dilatata oblongo-lanceolata scariosa. *Spicæ* axillares solitariae simplicissimæ erectæ 3-4-unciales folia vix æquantes, basifloræ, rachi tomentosa, floribus alternis sessilibus unibracteatis; bracteis cucullatis ovatis acutis persistentibus. *Perianthium* coloratum flavum deciduum : *ungues* inferne connati in tubum demum 4-partibilem : *laminæ* in limbum bilabiatum dispositæ, lanceolatae; dorsali labium superius

constituente latiore; antiearum media lateralibus angustiore. *Stamina* tubo inclusa, supra medium unguium inserta; *Filamenta* quatuor, brevia; *superiore* sterili apice cum stigmate connato; *reliqua* antherisera: *Antheræ laterales* dimidiatae; *inferior* didyma, lobis cum iis lateralium longitudinaliter connexis, ita ut lobus singulus inferioris cum respondentem lateralim loculum unicum tandem bivalvem constituit, nullo vestigio dissepimenti: *Pollen* triangulare. *Squamæ hypogynæ* nullæ. *Ovarium* turbinatum pubescens apiceque ornatum pilis brevibus crassis pellucidis strictis, monospermum: *Style* curvatus glaber sursum incrassatus deciduus: *Stigma* dilatatum obliquum, hinc apice filamenti arcuatisse connatum, inde desinens in cornua duo parallela distantia subulata. *Nux* crustacea obovata striata pilosa, apiceque coronata pappo brevi e pilis strictis crassioribus formato.

Obs. In my general observations on Proteaceæ I have noticed two very remarkable characters of *Synaphea*, namely, the cohesion of the barren filament with the stigma, which is peculiar to this genus, and the structure and connection of the antheræ, in which it agrees with *Conospermum*: it is also remarkable that these two nearly related genera should differ in the position of their barren and fertile stamens with relation to the perianthium; plants of the same natural family very generally agreeing in the order of abortion or suppression of these organs; to this, however, some other exceptions are known, and one has been already noticed as occurring in *Drapetes*.

The genus *Synaphea* seems to be confined to the southwest coast of New Holland, for it is more likely that *Polypodium spinulosum* of Burmannus (*flor. ind.* 233. t. 67. f. 1.) which I have formerly referred to this genus, as well as *Adiantum truncatum* of the same author, long since determined to be a species of *Acacia*, by Mr. Dryander, were brought from that coast to Batavia by one of the Dutch navigators, perhaps by Vlaming, than that they are really natives of Java, from which Burmannus received them.

DASYPOGON.

[608]

Ord. Nat. *Junceæ* inter Xerotem et Calectasiam.
Syst. Linn. *Hexandria Monogynia*, post Xerophytam.

CHAR. GEN. *Perianthium* duplex: *exterius* tubulosum, trifidum: *interius* triphyllum, foliolis semipetaloides

cochleariformibus. *Stamina* 6, imo perianthio inserta. *Ovarium* superum, uniloculare, trispermum, ovulis erectis. *Stylus* subulatus. *Stigma simplex*. *Utriculus* monospermus, tubo indurato aucto perianthii exterioris inclusus.

DASYPOGON BROMELIIFOLIUS. Tab. 8.

Dasypogon bromeliifolius. Prodr. fl. nov. holl. 263.

On the shores of King George's Sound; observed in flower and fruit in December, 1801.

DESC. *Planta* suffruticosa sesquipedalis bipedalis, habitu peculiaris, ad *Xerolem* aliquatenus accedit. *Caulis* simplicissimus teres foliatus, pilis strictis brevibus copiosis denticulatis reversis tectus. *Folia* graminea; radiculae conferta; caulinis sparsa superioribus remotis, breviore, semiamplexicaulia; omnia mucronata glabra marginibus denticulato-asperis. *Capitulum* terminale solitarium sphæricum, magnitudine nucis juglandis vel pruni minoris, bracteis nonnullis patulis foliiformibus involucratum. *Flores* sessiles conferti, paleis e dilatata basi lanceolatis margine denticulatis distincti, aliisque angustioribus intermixtis. *Perianthium exterior* 3-partitum, extus pilis longis strictis denticulatis barbatum; *unguis* in tubum subovatum leviter cohærentibus; *laminis* distinctis ovatis concavisculis inferne pallidis, supernè nigricantibus ibique intus pube tenuissima: *Interius* longitudine exterioris, glabrum; *unguis* angustis distinctis approximatis concavisculis hyalinis glabris; *laminis* ungue paulo latioribus, subellipticis ciliatis hyalinis, carina nigricauta apice pubescenti. *Stamina* ipsi basi perianthii inserta eoque fere duplo longiora: *Filamenta* æqualia filiformia alba glabra, apice incrassato subclavato cum apiculo brevi setaceo antherifero: *Antheræ* oblongæ pallidæ flavæ incumbentes, infra medium affixæ, biloculares, loculis appositis approximatis longitudinaliter dehiscentibus. *Ovarium* subovatum trigonum glabrum albicans, ovulis oblongis: *Stylus* strictus glaber albus, inferne obsoletè trigonus, supernè teres. *Utriculus* membranaceus, inclusus tubo perianthii exterioris incrassato nucamentaceo nitido fusco glabrato. *Semen* subglobosum, integumento simplicissimo connato; *Albumine* carnosò semini conformi. *Embryo* . . .

CALECTASIA.

Ord. Nat. *Juncæ*.

Syst Linn. *Hexandria Monogynia*.

CHAR. GEN. *Perianthium* inferum, tubulosum, hypocrateriforme, persistens: *limbo* petaloideo 6-partito, aestivatione imbricata. *Stamina* 6, fauci inserta: *Antheris* conniventibus, poro dupli apicis dehiscenti-

bus. *Ovarium* uniloculare, trispermum, ovulis erectis. *Stylus* filiformis. *Stigma* simplex. *Utriculus* monospermus, tubo indurato perianthii inclusus.

CALECTASIA CYANEA. Tab. 9.

Calectasia cyanea. *Prodr. fl. nov. holl.* 264.

On barren hills, near the shores of King George's Sound; flowering in December.

DESC. *Fruticulus* ramosissimus erectus cæspitem efformans, pedalis sesquipedalis, glaber; caule inferne tereti, basibus persistentibus foliorum squamoso. *Folia* e basibus dilatatis semivaginantibus imbricatis patula, acerosa auncipita rigida semuncialia, mucrone brevi pungenti terminata, glabra; ramea patula, ramulorum modice patentia confertiora. *Flores* ramulos breves ultimos terminantes solitarii, sessiles, foliis floralibus minoribus confertissimis, intimis albicantibus, infernè cincti. *Perianthium*: *Tubo* angusto-infundibuliformi subcarnoso viridi striato, extus villosiusculo, intus glabro: *Limbo* stellatim patulo, lacinias lanceolatis brevissime mucronulatis immerse nervosis parum concavis vivide cœruleis, disco extus villosiusculo. *Stamina* 6: *Filamenta* fauci peri anthii inserta, limbi lacinias opposita, conniventia curvata cœrulea glabra: *Antheræ* approximatæ, liberæ, oblongo-lineares obtusæ, basi emarginatæ affixæ, infernè quadriloculares, supernè biloculares poro duplice apicis dehiscentes. *Ovarium* subcyindraceum utrinque attenuatum dilute viride glabrum, longitudine tubi perianthii, uniloculare, trispermum, ovulis erectis: *Stylus* filiformis glaber cœruleus, basi pallidiore pauloque crassiore, pariter ac filamenta curvatus, staminibus paulo longior: *Stigma* acutum. *Utriculus* tubo indurato perianthii inclusus, tenuis, juxta basin transversim abseedens margine lacero, calyptra apicem seminis maturescentis tegente. *Semen* unicum, maturescens elongato-pyriforme teres tenuiter striatum, basi caudata funiculo capillari affixum. *Integumentum* simplicissimum nucleo arete cohærens, apice area fusca notatum. *Albumen* semiini conforme, dense carnosum, album, apice insculptum cavitate superficiali area fusca incrassata integumenti repleta. *Embryo*.

CORYANTHES.

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Ord. Nat. *Orchidæa*.

Syst. Linn. *Gynandria Monandria*.

Perianthium ringens: *Galea magna*: *Labium inferius* 4-partitum, nanum, occultatum *Labello* maximo cucullato vel tubuloso. *Anthera* terminalis, unilocularis, semibivalvis, persistens: *Massæ Pollinis* 4, pulvereæ.

CORYSANTHES FIMBRIATA. Tab. 10.

Corysanthes fimbriata. *Prodr. fl. nov. holl.* 328.

In shady places, especially under rocks and large stones, near Sydney, and in other parts of the colony of Port Jackson.

DESC. *Bulbus* solitarius pisiformis radicem longam teretem fibris nonnullis alternis simplicissimis instructam terminans.

Folium unicum, quasi radicale, sed caulem brevissimum demersum, basi squama unica semivaginanti subovata acuta instructum terminans, subrotundum mucrone brevissimo, basi altè cordata, lobis posticis rotundatis altero alterum equitante, explanatum horizontale, viride subtus dilutius, diametro subunciali, venosum venis dichotomis crebre anastomozantibus in nervum margini approximatum et parallelum desinentibus. *Flos* solitarius, pro ratione plantæ magnus, purpureus; *ovario* intra folium subsessili postice bractea semilanceolata erecta subtenso. *Perianthium* petaloideum sexpartitum ringens: *Foliola* tria exteriora, quorum *Galea* hyalina cum maculis crebris purpureis inæqualibus, e basi erecti uscula arcuata angustiore, superne dilatata obovata magis concava porrecta, apice incurvo, marginibus longitudinaliter nudis; duo *antica* cum lateralibus interiorum labium inferius descendentē-porrectum efformantia, subulata plana alba immaculata, ipsis basibus invicem connatis: *tria* interiora, quorum duo *lateralia* anticis exteriorum similia, e basi brevi porrecta adscendentia. *Labellum* maximum unguiculatum indivisum; *ungue* brevissimo eretto albo: *laminæ* dimidio inferiore adscendentē galeæ basi appresso, marginibus nudis inflexis tubum completem efformante, intus nigro sanguineo sursum dilutiore, paulo infra apicem albo virescenti rugoso subglarulosō; *superiore* dilatato ovato concavo deflexo, dilute purpureo maculis numerosis confluentibus rufosanguineis, disco intus paulo infra apicem glandulī sessilibus sparsis ornato marginibus inflexis fimbriatis lacinulis subulatis æqualibus.

Columna fructificationis inclusa, brevissima, adscendens, alba carnosa, basi parum coarctata, apice posticè trifido dentibus lateralibus erectis subulatis in-
[611] termedio antherifero. *Anthera* mobilis ovata membranacea purpurascens apice semibifido, unilocularis, apicem columnæ incumbens. *Masse Pollinis* 4, per paria cohærentes, farinaceæ, apicibus affixæ glandulae communi emarginaturam stigmatis operienti. *Ovarium* oblongum: *Stylus* cum basi columnæ conferruminatus: *Stigma* solutum, horizontale subrotundum, antice concavum, apice plica dupli coarctatum, antheræ subparallelum.

Obs. The three species of which this genus at present consists agree in their anthera being unilocular after bursting, in the singular relative proportions of the parts of the perianthium, and in habit; but in some points, generally of importance in this order of plants, they differ very remarkably, especially in the form of the labellum, which in one species is even furnished with a double calcar. *Corysanthes* may therefore be considered as affording a proof, and many others might be adduced, of the superior importance of certain modifications of the anthera to those of the labellum in Orchideæ.

AZOLLA.

Ord. Nat. *Marsileaceæ*.
Syst. Linn. *Cryptogamia Filices*.

CHAR. GEN. *Flores monoici*.

MASC. Gemini, involuero clauso monophyllo membranaceo inclusi (nunc solitarii femineum stipantes), ovati, biloculares, membrana exteriore transversim dehiscenti : *loculo superiore* corpusculis 9 vel 6 angulatis, circa axin perforatum apice demum apertum insertis : *loculo inferiore* sphærico clauso, sub dupli membrana materia fluida (demum pulvrea ?) repleto.

FEM. In diversis alis ejusdem frondis solitarii (nunc masculo inferiore stipati): *Involucrum* duplex, utrumque clausum membranaceum : *exterius* marium simile : *interius* ovatum, evalve ; includens *Capsulas* numerosas evalves, 6—9-spermas, affixas pedicellis capillaris e receptaculo communi baseos involueri interioris ortis. *Semina* angulata, radiculis exsertis.

AZOLLA PINNATA. *Tab. 10.*

Azolla fronde circumscriptione triangulari pinnata et semibipinnata ; [612 foliis superioribus papulosis, radicibus longitudinaliter plumosis. *Prodr. fl. nov. holl.* 167.

In lakes and ponds, frequent within the limits of the colony of Port Jackson.

DESC. *Plantula* natans, facie Jungermanniæ. *Radices* axillares solitariae perpendiculares hyalinæ, primo aspectu simplicissimæ, per lente plumosæ, novella calyptra glabra subulata tectæ. *Frons* semuncialis : *Ramis* distichis alternis approximatis parallelis teretiusculis; insimis haud raro pinnatis ; superioribus sæpe instructis gemmulis ramulorum nonnullis axillaribus teretibus. *Folia* alterna undique imbricata : in latere superiore frondis trapezoideo-ovata, crassiuscula cellulosa, viridia passim rubicunda, margine exteriore submembranaceo, supra convexiuscula papuloso-scabra, subtus lævia : in latere inferiore tenuiora lævia, subconformia vix tamen angulata. *Perichaetia* in superficie inferiore frondis, prope basin pinnæ solitariae.

Obs. Mr. Bauer's very satisfactory figure and the generic character already given, will in a great measure

supersede any farther description of the singular structure of this genus ; on which, however, it appears necessary to subjoin a few remarks.

Admitting the parts of fructification to be accurately described, it is not easy to understand in what manner the male influence is communicated to the female organ. In one instance the turbid fluid, which usually fills the cavity of the lower cell of the supposed male organ, was found converted into a powder, and it is not improbable that this change ultimately takes place in all cases where the organ attains perfection. This powder may be supposed either to be discharged by the lateral rupture of the double coat of the containing cell, or a communication may at length be opened between this cell and the tubular axis of the upper cell, which, after the separation of its outer membrane, is open at the top ; in this case the ejection of the pollen, or even of a fluid matter, may possibly be aided by the pressure or action of the angular solid bodies which surround this axis, and its dispersion would, no doubt, be assisted by the increased surface of its divided apex.

But whatever supposition may be formed respecting the economy of this part, it appears to me that as it is found in a second species of the genus, and of essentially the same [613] structure, though slightly modified, the angular bodies of the upper cell being only six in number, there can remain little doubt of its being really the male organ.

The genus *Azolla* was founded by Lamarck on specimens of the South American species entirely destitute of fructification, the remains of which only appear to have been seen more recently by Willdenow, who describes it as “*a Capsula unilocularis polysperma.*”

REFERENCES TO TAB. 10.

AZOLLA PINNATA.

1. Plant of the natural size.
2. — magnified.

3. Leaves, magnified.
 4. Male involucrum, containing two flowers, magnified.
 5. — empty.
 6. Two male flowers.
 7. A male flower divided longitudinally.
 8. — deprived of its Calyptra, 9.
 10. Lower cell of a male flower.
 - 11 and 12. Different views of the contents of the upper cell.
 13. Longitudinal section of the upper cell.
 14. Inner female involucrum.
 15. Capsules, with their footstalks arising from the base of the involucrum.
 16. A capsule more highly magnified.
 17. — opened transversely to show the position of the seeds.
 18. — empty.
 19. Seeds.
-

L I S T
OF
NEW AND RARE PLANTS,

COLLECTED IN

A B Y S S I N I A
DURING THE YEARS 1805 AND 1810,

ARRANGED ACCORDING TO THE LINNÆAN SYSTEM.

[Reprinted from '*A Voyage to Abyssinia*', by Henry Salt, Esq., F.R.S., &c.
Append., pp. lxiii—lxv.]

LONDON.

—
1814.

L I S T

(Append. p. Ixiii)

OF

NEW AND RARE PLANTS, &c.

"THE plants having Br. MSS. annexed form new genera, described in the manuscripts of Mr. Brown. To this gentleman's kindness I am indebted for the list, which he made out from a collection of dried specimens brought by me into the country, and now in the possession of Sir Joseph Banks. The names without reference are considered by Mr. Brown as applying to new species; and for the few that have been published already, contracted references are given to the works in which they occur, namely, Willdenow's 'Species Plantarum'; Forskal's 'Flora Ægyptiaco-Arabica'; Vahl's 'Symbolæ Botanicæ'; and the Appendix to the Travels of Mr. Bruce."

DIANDRIA.

- Jasminum abyssinicum.*
- Hypoestis* Forskali (*Justicia* Forskali, *Willd.* sp. pl.)
- Justicia* cynanchifolia.
— *bivalvis.* *Willd.* sp. pl.
- Meisarrhena* tomentosa. *Br. MSS.*
- Salvia* abyssinica.
- Stachytarpheta* cinerea.

TRIANDRIA.

- Geissorhiza* abyssinica.
- Commelina* hirsuta.
— *acuminata.*
- Cyperus* involutus.
— *laxus.*
— *scirpoides.*

Cyperus melanocephalus.

- *densus.*
- Cenchrus* tripsacoides.
- Pennisetum* villosum.
- Aristida* ramosa.
- Eleusine* (?) *stolonifer.*
- Panicum* ovale.

TETRANDRIA.

- Pavetta* congesta.
— *reflexa.*
- Canthium* lucidum.
- Buddleia* acumiata. (*Umfar. Bruce.*)
— *foliata.*
- Nuxia* congesta.
— *dentata.*
- Dobera* glabra. (*Tomex* glabra, *Forsk.*)
- Fusanus* alternifolia.

PENTANDRIA.

- Heliotropium gracile.*
— *cinereum.*
— *ellipticum.*
— *? dubium.*
Lithospermum ? ambiguum.
Anchusa affinis.
lxiv] *Ehretia obovata.*
— *abyssinica.*
Cordia ovalis.
— *abyssinica* (*Wanzey, Bruce.*)
Plumbago eglandulosa.
Convolvulus cirrhosus.
— *congestus.*
— *pilosus.*
Neurocarpaea lanceolata, Br. MSS.
(*Manettia lanceolata, Vahl.*)
Solanum cinereum.
— *uncinatum.*
Erythraea compar.
Strema longifolia.
— *farinosa, Willd. sp. pl.*
— *rotundifolia, Willd. sp. pl.*
Rhamnus inebrians, (called in Tigré
“Sadoo”)
Celastrus serrulatus.
— *glaucus.*
Impatiens tenella.
Paronychia sedifolia.
Saltia abyssinica, Br. MSS.
Carissa abyssinica.
— *edulis, Willd. sp. pl.*
Kanahia laniflora. (*Asclepias lani-*
flora, Willd. sp. pl.)
Pentatropis cyanochoides, Br. MSS.
Petalostemma chenopodii, Br. MSS.
Breweria evolvoloides.
Taxanthemum attenuatum.
Crassula puberula.

HEXANDRIA.

- Loranthus laetus.*
— *congestus.*
— *calycinus.*

OCTANDRIA.

- Combretum ovale.*
— *molle.*
Amyris Gileadensis, Willd. sp. pl.
— *Katal, Willd. sp. pl.*
Polygonum sinuatum.

DECANDRIA.

- Cassia pubescens.*

- Pterolobium lacerans, Br. MSS.* (Kan-
tuffa, *Bruce.*)
Fagonia armata.
Terminalia cycloptera.
Dianthus abyssinicus.

DODECANDRIA.

- Calanchoe pubescens.*
Sterculia abyssinica.
Reseda pedunculata.

ICOSANDRIA.

- Rosa abyssinica.*
Rubus compar.

POLYANDRIA.

- Corchorus gracilis.*

DIDYNAMIA.

- Nepeta azurea.*
Satureja ovata.
— *punctata.*
Ocymum cinereum.
— *monadelphum.*
Leucas quinquedentata.
— *affinis.*
Molucella integrifolia.
— *scariosa.*
— *repanda.*
Linaria gracilis.
— *hastata.*
— *propinqua.*
Buchnera orobanchoides.
Dunalia acaulis, Br. MSS.
Biguonia discolor.
Sesamum pterospermum.
Barleria brevispina.
— *macracantha.*
— *eranthemooides.*
— *grandiflora.*
— *mollis.*
— *parviflora.*

- Acanthus tetragonon.
Thunbergia angulata.
Lantana polycephala.
Clerodendrum myricoides.

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TETRADYNAMIA.

- Mathiola elliptica.*
Cleome Siliquaria. (*Siliquaria glan-*
dulosa, Forsk. Ægypt. 78.)
— *Roridula* (*Roridula, Forsk.*
Ægypt. 35.)
— *parviflora.*
— *paradoxa.*

MONADELPHIA.

- Pelargonium abyssinicum.*
Geranium compar.
Sida acuminata.
 — *gracilis.*
 — *pannosa.*
Hibiscus parvifolius.
 — *erianthus.*
Urena mollis.
 — *glabra.*

DIADELPHIA.

- Polygala linearis.*
 — *abyssinica.*
Erythrina tomentosa.
Crotalaria Saltiana.
 — *propinquua.*
 — *farcta.*
Onobrychis simplicifolia.
Indigofera albicans.
 — *diffusa.*

SYNGENESIA.

- Brachilema paniculatum, Br. MSS.*
Teichostemma fruticosum, Br. MSS.
Cacalia abyssinica.
Pulicaria involucrata.
 — *viscida.*
 — *aromatica.*

MONŒCIA.

- Euphorbia propinqua.*
Dalechampia tripartita.
Croton acuminatum.

DIECIA.

- Cissampelos nymphæfolia.*

POLYGAMIA.

- Acacia lœta.*
 — *fasciculata.*

CRYPTOGAMIA.

- Cheilanthes leptophylla.*

OBSERVATIONS,
SYSTEMATICAL AND GEOGRAPHICAL,
ON
THE HERBARIUM
COLLECTED BY
PROFESSOR CHRISTIAN SMITH,
IN THE
VICINITY OF THE CONGO,
DURING THE EXPEDITION TO EXPLORE THAT RIVER,
UNDER THE
COMMAND OF CAPTAIN TUCKEY,
IN THE YEAR 1816.

BY
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NEW YORK, MEMBER OF THE WERNERIAN SOCIETY
OF EDINBURGH. LIBRARIAN TO THE
LINNEAN SOCIETY.

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LONDON:

1818.

OBSERVATIONS, &c.

[420]

THE Herbarium formed by the late Professor Smith and his assistant, Mr. David Lockhart, on the banks of the Congo, was, on its arrival in England, placed at the disposal of Sir Joseph Banks ; under whose inspection it has been arranged ; the more remarkable species have been determined ; and the whole collection has been so far examined as the very limited time which could be devoted to this object allowed.

In the following pages will be found the more general results only of this examination ; descriptions of the new genera and species being reserved for a future publication.

In communicating these results I shall follow nearly the same plan as that adopted in the Botanical Appendix to Captain Flinders's *Voyage to Terra Australis* :

1st. Stating what relates to the three Primary Divisions of Plants.

2dly. Proceeding to notice whatever appears most remarkable in the several Natural Orders of which the collection consists ; and

3dly. Concluding with a general comparison of the vegetation on the line of the river Congo, with that of other equinoctial countries.

1. The number of species in the herbarium somewhat exceeds 600 ; the specimens of several of which are, indeed, imperfect ; but they are all referable with certainty to the primary divisions, and, with very few exceptions, to the natural orders to which they belong.

Of the Primary Divisions, the Dicotyledonous plants amount to 460.

The Monocotyledonous to 113

And of the Acotyledonous, in which Ferns are included, there are only 33 species.

It is a necessary preliminary, with reference especially to the first part of my subject, to determine whether this herbarium, which was collected in a period not exceeding two months, and in a season somewhat unfavourable, can [421] warrant any conclusions concerning the proportional numbers of the three primary divisions, or of the principal natural orders in the country in which it was formed.

Its value in this respect must depend on the relation it may be supposed to have to the whole vegetation of the tract examined, and of the probability of the circumstances under which it was formed, not materially affecting the proportions in question.

Its probable relation to the complete Flora of the country examined, can at present be judged of only by comparing it with collections from different parts of the same coast of equinoctial Africa.

The first considerable herbarium from this coast, of which we have any account, is that formed by Adanson, on the banks of the Senegal, during a residence of nearly four years. Adanson himself has not given the extent of his collection, but as he has stated the new species contained in it to be 300,¹ it may, I think, be inferred, that altogether it did not exceed 600, which is hardly equal to that from Congo. Limited as this supposed extent of Adanson's herbarium may appear, it is estimated on the most moderate calculation of the proportion that new species were likely to bear to the whole vegetation of that part of equinoctial Africa, which he was the first botanist to examine; allowance being at the same time made for the disposition manifested in the account of his travels, to reduce the plants which he observed to the nearly related species of other countries.

From the herbarium and manuscripts in the library of

¹ *Fam. des Plant.* 1, p. cxvi.

Sir Joseph Banks, it appears that the species of plants collected by Mr. Smeathman at Sierra Leone, during a residence of more than two years, amounted to 450.

On the same authority I find that the herbarium formed in the neighbourhood of Cape Coast by Mr. William Brass, an intelligent collector, consisted of only 250 species.

And I have some reason to believe, that the most extensive and valuable collection ever brought from the west coast of equinoctial Africa, namely, that formed by Professor Afzelius, during his residence of several years at Sierra Leone, does not exceed 1200 species ; although that eminent naturalist, in the course of his researches, must have examined a much greater extent of country than was seen in the expedition to Congo.

From these, which are the only facts I have been able to meet with respecting the number of species collected ¹⁴²² on different parts of this line of coast, I am inclined to regard the herbarium from Congo as containing so considerable a part of the whole vegetation, that it may be employed, though certainly not with complete confidence, in determining the proportional numbers both of the primary divisions and principal natural orders of the tract examined ; especially as I find a remarkable coincidence between these proportions in this herbarium and in that of Smeathman from Sierra Leone.

I may remark here, that from the very limited extent of the collections of plants above enumerated, as well as from what we know of the north coast of New Holland, and I believe I may add of the Flora of India, it would seem that the comparative number of species in equal areas within the tropics and in the lower latitudes beyond them, has not been correctly estimated ; and that the great superiority of the intratropical ratio given by Baron Humboldt, deduced probably from his own observations in America, can hardly be extended to other equinoctial countries. In Africa and New Holland, at least, the greatest number of species in a given extent of surface does not appear to exist within the tropics, but nearly in the parallel of the Cape of Good Hope.

In the sketch which I have given of the botany of New

Holland, I first suggested the inquiry respecting the proportions of the primary divisions of plants as connected with climate; and I then ventured to state that "from the equator to 30° lat. in the northern hemisphere at least, the species of Dicotyledonous plants are to the Monocotyledonous as about 5 to 1, in some cases considerably exceeding, and in a very few falling somewhat short of this proportion, and that in the higher latitudes a gradual diminution of Dicotyledones takes place until in about 60° N., and 55° S. lat. they scarcely equal half their intratropical proportion."¹

Since the publication of the Essay from which this quotation is taken, the illustrious traveller Baron Humboldt, to whom every part of botany, and especially botanical geography, is so greatly indebted, has prosecuted this subject further, by extending the inquiry to the natural orders of plants; and in the valuable dissertation prefixed to his great botanical work,² has adopted the same equinoctial proportion of Monocotyledones to Dicotyledones as that given in the Paper above quoted; a ratio which seems to be confirmed by his own extensive herbarium.

I had remarked, however, in the Essay referred to, that the relative number of these two primary divisions in the equinoctial parts of New Holland appeared to differ considerably from those which I had regarded as general within the tropics; Dicotyledones being to Monocotyledones only as 4 to 1. But this proportion of New Holland very nearly agrees with that of the Congo and Sierra Leone collections. And from an examination of the materials composing Dr. Roxburgh's unpublished Flora Indica, which I had formerly judged of merely by the index of genera and species, I am inclined to think that nearly the same proportion exists on the shores of India.

Though this may be the general proportion of the coasts, and in tracts of but little varied surface within the tropics,

¹ *Flinders' Voyage to Terra Australis*, 2, p. 538. (*Antè*, p. 8.)

² *Nova Genera et Species Plantarum*, quas in perigrinazione orbis novi collegerunt, &c. *Amat. Bonpland et Alex. de Humboldt*. ex. sched. autogr. in ord. dig. *C. S. Kunth*, 1815, *Parisiis*.

it seems at the same time probable from Baron Humboldt's extensive collections, and from what we know of the vegetation of the West India islands, that in equinoctial America, in tracts including a considerable portion of high land, the ratio of Dicotyledones to Monocotyledones is at least that of 11 to 2, or perhaps nearly 6 to 1. Whether this or a somewhat diminished proportion of Dicotyledones exists also in similar regions of other equinoctial countries, we have not yet sufficient materials for determining.

Upon the whole, however, it would seem from the facts of which we are already in possession, that the proportions of the two primary divisions of phænogamous plants vary considerably even within the tropics, from circumstances connected certainly in some degree with temperature. But there are facts also which render it probable, that these proportions are not solely dependent on climate. Thus the proportion of the Congo collection, which is also that of the equinoctial part of New Holland, is found to exist both in North and South Africa, as well as in Van Diemen's Island, and in the south of Europe.

It is true indeed that from about 45° as far as to 60° , or perhaps even to 65° N. lat. there appears to be a gradual diminution in the relative number of Dicotyledones; but it by no means follows that in still higher latitudes a further reduction of this primary division takes place. On the contrary, it seems probable from Chevalier Giesecke's list of the plants of the west coast of Greenland,¹ on different parts of which, from lat. 60° to 72° , he resided several years, that the relative numbers of the two primary divisions of phænogamous plants are inverted on the more northern parts of the coast;² Dicotyledones being to Monocotyledones, in the list referred to, as about 4 to 1,

¹ Article "Greenland," in Brewster's 'Edinburgh Encyclopædia.'

² That some change of this kind takes place on that coast might perhaps have been conjectured from a passage in Hans Egede's 'Description of Greenland,' where it is stated, that although from lat. 60° to 65° there is a considerable proportion of good meadow land, yet in the more northern parts, "the inhabitants cannot gather grass enough to put in their shoes, to keep their feet warm, but are obliged to buy it from the southern parts." (English Translation, pp. 44 and 47.)

or nearly as on the shores of equinoctial countries. And analogous to this inversion it appears, that at corresponding Alpine heights, both in the temperate and frigid zones, the proportion of Dictyledones is still further increased.

The ACOTYLEDONOUS or cryptogamous plants of the herbarium from Congo, are to the phænogamous as about 1 to 18. Some allowance is here to be made for the season, peculiarly unfavourable, no doubt, for the investigation of this class of plants. But it is not likely that Professor Smith, who had particularly studied most of the cryptogamous tribes, should have neglected them in this expedition; and the circumstance of the very few imperfect specimens of Mosses in the collection being carefully preserved and separately enveloped in paper, seems to prove the attention paid to, and consequently the great rarity of, this order at least; which, however, is not more striking than what I have formerly noticed with respect to some parts of the north coast of New Holland.¹

I have in the same place considered the Acotyledones of equinoctial New Holland, as probably forming but one thirteenth of the whole number of plants, while the general equinoctial proportion was conjectured to be one sixth. This general ratio, however, is certainly over-rated, though it is probably an approximation to that of countries containing a considerable portion of high land. Within the tropics, therefore, it would seem that the ratio of acotyledonous to phænogamous plants, varies from that of 1 : 15 to 1 : 5; the former being considered as an approximation to the proportion of the shores, the latter to that of mountainous countries.

^{425]} II. The NATURAL ORDERS of which the herbarium from Congo consists are 87 in number; besides a very few genera not referable to any families yet established. More than half the species, however, belong to nine orders, namely, to Filices, Gramineæ, Cyperaceæ, Convolvulaceæ, Rubiaceæ, Compositæ, Malvaceæ, Leguminosæ, and Euphorbiaceæ; all of which have their greatest

¹ Flinders' Voyage, 2, p. 539. (Autè, pp. 9, 10.)

number of species in the lower latitudes, and several within the tropics.

I now proceed to make some observations on the orders above enumerated, and on such of the other families, included in the collection, as present anything remarkable, either in their geographical distribution, or in their structure; more especially where the latter establishes or suggests new affinities; and I shall take them nearly in the same order as that followed in the botanical appendix to Captain Flinders's Voyage.

ANONACEÆ. Only three species of this family are contained in the collection. One of these is *Anona Senegalensis*, of which the genus has been considered doubtful, even by M. Dunal in his late valuable Monograph of the order.¹ That it really belongs to Anona, however, appears from the specimen with ripe fruit preserved in the collection. It is remarkable therefore as the only species of this genus yet known which is not a native of equinoctial America; for *Anona Asiatica*, of which Linnæus had no specimen in his herbarium when he first proposed it under this name, according to the original synonym, is nothing more than *Anona muricata*: and *A. obtusiflora*, supposed by M. Tussac² to have been introduced into the American Islands from Asia, does not appear to differ from *A. mucosa* of Jacquin, which is known to be a native of Martinica.

The second plant of this order in the collection is very nearly related to *Piper Æthiopicum* of the shops, the *Unona Æthiopica*, and perhaps also *Unona aromatica* of Dunal:³ these with several plants already published, form a genus, which, like Anona, is common to America and Africa, but of which no species has yet been observed in Asia.

Of MALPIGHIACEÆ, an order chiefly belonging to equinoctial America, there are also three species from Congo.

One of these is *Banisteria Leona*, first described, from [426]

¹ *Monogr. de la famille des Anonacées*, p. 76.

² *Flore des Antilles*, 1, p. 193. ³ *Anonac*, p. 113 et 112.

Smeathman's specimens, by Cavanilles,¹ who has added the fruit of a very different plant to his figure, and quotes the herbarium of M. de Jussieu as authority for this species being likewise a native of America, which is, I believe, equally a mistake.

The two remaining plants of Malpighiaceæ, in the collection, with some additional species from different parts of the coast, form a new genus, having the fruit of *Banisteria*, but with sufficient distinguishing characters in the parts of the flower, and remarkable in having alternate leaves. From this disposition of leaves, in which the genus here noticed differs from all others decidedly belonging to the order, an additional argument is afforded, for referring *Vitmannia* to Malpighiaceæ, as proposed by M. du Petit Thouars;² and the approximation, though perhaps not the absolute union of *Erythroxylon* to the same family is confirmed.

It may not be improper here to notice a very remarkable deviation from the usual structure of leaves in Malpighiaceæ, which is supposed to occur in a plant of equinoctial Africa, namely *Flabellaria pinnata* of Cavanilles (the *Hiræa pinnata* of Willdenow). It is certain, however, that the figure given by Cavanilles of this species is made up from two very different genera; the pinnated leaf belonging to an unpublished *Pterocarpus*; the fructification to a species of *Hiræa*, having simple opposite leaves. The evidence respecting this blunder, which was detected by Mr. Dryander, is to be found in the herbarium of Sir Joseph Banks.

In Malpighiaceæ the insertion of the ovulum is towards its apex, or considerably above its middle; and the radicle of the embryo is uniformly superior. In these points *Banisteria* presents no exception to the general structure, though Gærtner has described its radicle as inferior, and M. de Jussieu does not appear to have satisfied himself respecting the fact.³ It appears, however, that M. Richard

¹ *Dissert.* 424, t. 247.

² *In Nov. gen. Madagasc.* n. 46 (*Biporeia*).

³ *Annal. du Mus. d'Hist. Nat.* 18, p. 480.

is aware of the constancy in the direction of the embryo in this order.¹

HIPPOCRATICEÆ. M. de Jussieu has lately proposed this as a distinct family,² of which there are two plants in the collection. The first is a species of Hippocratea; the second is referable to Salacia.

In Hippocraticeæ, the insertion of the ovula is either ^{or}² towards the base, or is central; the direction of the radicle is always inferior. In these points of structure, which are left undetermined by M. de Jussieu, they differ from Malpighiaceæ, but agree with Celastrinæ, to which, notwithstanding the difference in insertion and number of stamens, and in the want of albumen, they appear to me to have a considerable degree of affinity; especially to Eleodendrum, where the albumen is hardly visible, and to Ptelidium, as suggested by M. du Petit Thouars,³ in which it is reduced to a thin membrane.

SAPINDACEÆ. Only four plants of this natural family, which is almost entirely equinoctial, occur in the herbarium. Two of these are new species of Sapindus. The third is probably not specifically different from *Cardiospermum grandiflorum* of the West India Islands. And the fourth is so nearly related to *Paullinia pinnata*, of the opposite coast of America, as to be with difficulty distinguished from it. M. de Jussieu,⁴ who probably intends the same plant, when he states *P. pinnata* to be a native of equinoctial Africa, has also described a second species from Senegal.⁵ No other species of this genus has hitherto been found, except in equinoctial America; for *Paullinia Japonica* of Thunberg, probably belongs even to a different natural order. The species from Congo, however, seems to be a very general plant on this line of coast; having been found by Brass near Cape Coast, and by Park on the banks of the Gambia.

¹ *Mem. du Mus. d'Hist. Nat.* 2, p. 400.

² *Annal. du Mus. d'Hist. Nat.* 18, p. 183.

³ *Hist. des Végét. des Isles de l'Afrique*, p. 34.

⁴ *In Annal. du Mus. d'Hist. Nat.* 4, p. 317. ⁵ *Loc. cit.*, p. 348.

In Sapindaceæ there is not the same constancy in the insertion of the ovulum and consequent direction of embryo, as in the two preceding orders. For although, in the far greater part of this family, the ovulum is erect and the radicle of the embryo inferior, yet it includes more than one genus in which both the seeds and the embryo are inverted. With this fact it would seem M. de Jussieu is unacquainted;¹ and he is surely not aware that in his late Memoir on *Melicocca*² he has referred plants to that genus differing from each other in this important point of structure.

TILIACEÆ. It is remarkable that of only nine ^{428]} species belonging to this family in Professor Smith's herbarium, three should form genera hitherto unnoticed.

The *first* of these new genera is a shrub, in several of its characters related to *Sparmannia*, like which, it has the greater part of its outer stamens destitute of antheræ; in the structure of its fruit, however, it approaches more nearly to *Corchorus*.

The *second* genus also agrees with *Corchorus* in its fruit; but differs from it sufficiently in the form and dehiscence of the antheræ; as well as in the short pedicellus, like that of *Grewia*, elevating its stamens and pistillum.

The *third*, of which the specimens are in fruit only, fortunately, however, accompanied by the persistent flower, is remarkable in having a calyx of three lobes, while its corolla consists of five petals; the stamens are in indefinite number; and the fruit is composed of five single-seeded capsules, connected only at the base. In the want of symmetry or proportion between the divisions of its calyx and corolla it resembles the *Chlenaceæ* of M. Du Petit Thouars,³ as well as *Oncoba* of Forskael and *Ventenatia* of M. de Beauvois.⁴ The existence of this new genus decidedly belonging to Tiliaceæ, and having a considerable resemblance to Vente-

¹ *Annal. du Mus. d'Hist. Nat.* 18, p. 476.

² *Mém. du Mus. d'Hist. Nat.* 3, p. 179.

³ *Hist. des Végét. des Isles de l'Afrique*, p. 46.

⁴ *Flore d'Oucare*, 1, p. 29, t. 17.

natia, whose place in the system is, indeed, not yet determined, but of which the habit is nearly that of *Rhodolæna*, seems in some degree to confirm M. du Petit Thouars's opinion of the near relation of Chlenaceæ to Tiliaceæ ; though M. de Jussieu, in placing it between Ebenaceæ and Rhodoraceæ,¹ appears to take a very different view of its affinities.

MALVACEÆ. Of this family 18 species were observed on the banks of the Congo. It forms, therefore, about one thirty-fourth part of the phænogamous plants of the collection ; which is somewhat greater than the equinoctial proportion of the order, as stated in Baron Humboldt's dissertation,² but nearly agrees with that of India, according to Dr. Roxburgh's unpublished *Flora Indica*.

The greater part of the Malvaceæ of the collection belong to *Sida* and *Hibiscus* ; and certain species of both these genera are common to India and America. *Urena Americana* and *Malachra radiata*, hitherto supposed to be natives of America only, are also contained in the collection ; and ¹⁴²⁹ the loftiest tree seen on the banks of the Congo, is a species of *Bombax*, which, as far as can be determined from the very imperfect specimens preserved in the herbarium, does not differ from *Bombax pentandrum* of America and India. I have formerly remarked³ that Malvaceæ, Tiliaceæ, Hermanniaceæ, Buttneriaceæ, and Sterculiaceæ, constitute one natural class ; of which the orders appear to me as nearly related as the different sections of Rosaceæ are to each other. In both these, as well as in several other cases that might be mentioned, there seems to be a necessity for the establishment of natural classes, to which proper names, derived from the orders best known, and differing perhaps in termination, might be given.

It is remarkable that the most general character connecting the different orders of the class now proposed, and which may be named from its principal order Malvaceæ, should

¹ *Mirbel, Elem. de Physiol. Veg. et de Bot.* 2, p. 855.

² *Prolegomena*, p. xviii. *De Distrib. Geogr. Plant.*, p. 43.

³ *Flinders's Voy.* 2, p. 540. (*Antè*, p. 11.)

be that of the valvular aestivation of the calyx; for several, at least, of the genera at present referred to Tiliaceæ, in which this character is not found, ought probably, for other reasons likewise, to be excluded from that order: and hence perhaps also the Chlenaceæ, though nearly related, are not strictly referable to the class Malvaceæ, from all of whose orders, it must be admitted, they differ considerably in habit.

LEGUMINOSÆ. According to Baron Humboldt,¹ this family, or class, as I am rather disposed to consider it, constitutes one twelfth of the phænogamous plants within the tropics. Its proportion, however, is much greater in Professor Smith's herbarium, in which there are 96 species belonging to it, or nearly one sixth of the whole collection. And ample allowance being made for the lateness of the season when the collection was formed, which might be supposed to reduce the number of this family less than many of the others, Leguminosæ may be stated as forming one eighth of the Phænogamous plants on the banks of the Congo. In India, it probably forms about one ninth, which is also nearly the proportion it bears to Phænogamous plants in the equinoctial part of New Holland.

I have formerly proposed to subdivide Leguminosæ into three orders.²

Of the first of these orders, MIMOSEÆ, there are only ⁴³⁰ eight species from Congo, seven of which belong to Acacia, as it is at present constituted; the eighth is a sensitive aculeated Mimosa very nearly allied to *M. aspera* of the West Indies, as well as to *M. canescens* of Willdenow, found by Isert in Guinea; and perhaps is not different from the species mentioned by Adanson as being common on the banks of the Senegal.

Of the second order, CÆSALPINEÆ, the collection contains 19 species, among which there are four unpub-

¹ *Op. citat.*

² *Flinders' Voy. 2, p. 551. (Antè, p. 22.)*

lished genera. One of these is *Erythrophleum* of Afzelius, the Red Water Tree of Sierra Leone; another species of which genus is the ordeal plant, or *Cassa* of the natives of Congo. *Guilandina Bonduc* and *Cassia occidentalis*, are also in the herbarium; the former, I believe, is unquestionably common to India and America; whether *Cassia occidentalis* be really a native of India and equinoctial Africa, in both of which it is now at least naturalized, is perhaps doubtful.

Among PAPILIONACEÆ, which constitute the principal part of Leguminosæ in the collection, there is only one plant with stamina entirely distinct. This decandrous plant forms a genus very different from any yet established, but to which *Podalyria bracteata* of Roxburgh¹ belongs.

The genera composing Papilionaceæ on the banks of the Congo have, upon the whole, a much nearer relation to those of India than of equinoctial America. To this, however, there is one remarkable exception. For of the only two species of *Pterocarpus* in the collection, one is hardly to be distinguished from *P. Ecastaphyllum*, unless by the want of the short acumen existing in the plant of Jamaica. The second agrees entirely with Linnæus's original specimen of *P. lunatus* from Surinam, and seems to be not uncommon on the west coast of equinoctial Africa; having been observed by Professor Afzelius at Sierra Leone, and probably by Isert in Guinea;² while no species of *Pterocarpus* related to either of these has hitherto been observed in India. On the other hand *Abrus precatorius* and *Hedysarum triflorum*, both of which occur in the collection, are common to equinoctial Asia and America.

TEREBINTACEÆ, as given by M. de Jussieu, appears to be made up of several orders nearly related to each other, and of certain genera having but little affinity to any of them. Of this, indeed, the illustrious author of the Genera Plantarum seems to have been aware. He pro-

¹ *Coromand. Plants*, 3 tab.

² *Reise nach Guinea*, p. 116.

bably, however, had not the means of ascertaining all their distinguishing characters, and therefore preferred leaving the order nearly as it was originally proposed by Bernard de Jussieu in 1759.

One of the orders included in Terebintaceæ, and which is proposed by M. de Jussieu himself, under the name of CASSUVIÆ, consists of *Anacardium*, *Semecarpus*, *Mangifera*, *Rhus*, and *Buchanania*, with some other unpublished genera.

The perigynous insertion of stamens in *Cassuviae* (or *Anacardeæ*) may be admitted in doubtful cases from analogy, there being an unpublished genus belonging to it even with ovarium inferum. And the ovary, though in all cases of one cell, with a single ovulum, may, at least in those genera in which the style is divided, be supposed to unite in its substance the imperfect ovaria indicated by the branches of the style, and which in *Buchanania* are actually distinct from the complete organ. The only plant belonging to this order in the herbarium, is a species of *Rhus*, with simple verticillate leaves, and very nearly approaching in habit to two unpublished species of the genus from the Cape of Good Hope.

AMYRIDEÆ, another family included in Terebintaceæ, and to which the greater part of Jussieu's second section belongs, may, like the former order, be considered as having in all cases perigynous insertion of stamens; this structure being manifest in some of its genera. Of Amyrideæ, there are two plants in the collection. The first of these is a male plant, probably of a species of *Sorindeia*;¹ the second, which is the *Safu* of the natives, by whom it is cultivated on account of its fruit, cannot be determined from the imperfect state of the specimens; it is, however, probably related to *Poupartia* or *Bursera*.

CONNARACEÆ, is a third family which I propose to separate from Terebintaceæ: it consists of *Connarus* *Linn.* *Cnestis* *Juss.* and *Rourea* of Aublet or *Robergia* of Schre-

¹ *Aubert du Petit Thouars, nov. gen. Mudugas. n. 80.*

ber. The insertion of stamina, in this family, is ambiguous; but as in a species of *Cnestis* from Congo, they originate from, or at least firmly cohere with, the pedicellus of the ovaria, they may be considered perhaps in all the ¹⁴³² genera rather as hypogynous than perigynous. The most important distinguishing characters of Connaraceæ consist in the insertion of the two collateral ovula of each of its pistilla being near the base; while the radicle of the embryo is situated at the upper or opposite extremity of the seed, which is always solitary. In *Connarus* there is but one ovarium, and the seed (figured by Gærtner under the name of *Omphalobium*) is destitute of albumen. *Rourea* or *Robergia* has always five ovaria, though in general one only comes to maturity. Its seed, like that of *Connarus*, is without albumen, and the aestivation of the calyx is imbricate.

Of *Cnestis* there are several new species in Professor Smith's herbarium. This genus has also five ovaria, all of which frequently ripen; the albumen forms a considerable part of the mass of the seed; and the aestivation of the calyx is valvular. The genera of this group, therefore, differ from each other, in having one or more ovaria; in the existence or absence of albumen; and in the imbricate or valvular aestivation of calyx. Any one of these characters singly is frequently of more than generic importance, though here even when all are taken together, they appear insufficient to separate *Cnestis* from *Connarus*.

In considering the place of the Connaraceæ in the system, they appear evidently connected on the one hand with Leguminosæ, from which *Connarus* can only be distinguished by the relation the parts of its embryo have to the umbilicus of the seed. On the other hand, *Cnestis* seems to me to approach to *Averrhoa*, which agrees with it in habit, and in many respects in the structure of its flower and seed; differing from it, however, in its five ovaria being united, in the greater number of ovula in each cell, in the very different texture of its fruit, and in some degree in the situation of the umbilicus of the seed.

But *Averrhoa* agrees with *Oxalis* in every important

point of structure of its flower, and in most respects in that of its seed.

Oxalis, indeed, differs from *Averrhoa* in the texture of its fruits, in some respects in the structure of its seed; and very widely in habit, in the greater part of its species. The difference in habit, however, is not so great in some species of *Oxalis*; as for example, in those with pinnated and even ternate leaves from equinoctial America; and in that natural division of the genus including *O. sensitiva*, of which there are two species in the Congo herbarium.
[433] This latter section of *Oxalis*¹ agrees also with *Averrhoa Carambola*² in the foliola, when irritated, being reflected or dependent, which is likewise their position in the state of collapsion or sleep, in all the species of both genera.

To the natural order formed by *Oxalis* and *Averrhoa*, the name of **OXALIDEÆ** may be given, in preference to that of *Sensitivæ*, under which, however, Batsch³ was the first to propose the association of these two genera, and to point out their agreement in sensible qualities and irritability of leaves.

M. de Jussieu, in a memoir recently published,⁴ has proposed to remove *Oxalis* from *Geraniaceæ*, to which he had formerly annexed it, and to unite it with *Diosmeæ*.

It appears to me to have a much nearer affinity to *Zygophylleæ*,⁵ though it is surely less intimately connected with that order than with *Averrhoa*.

I am aware that M. Correa de Serra, one of the most profound and philosophical botanists of the present age, has considered *Averrhoa* as nearly related to *Rhamneæ*⁶ or rather to *Celastrinæ*; from which, however, it differs in the number and insertion of stamina and especially in the direction of the embryo, with respect to the pericarpium.

In all these characters *Averrhoa* agrees with *Oxalis*; its relation to which is further confirmed on considering the appendage of the seed or arillus, whose modifications in

¹ Herba sentiens, *Rumph. Amboin.* 5, p. 301.

² Bruce in *Philos. Transact.* 75, p. 356. ³ Tab. affin. p. 23.

⁴ *Mém. du Mus. d'Hist. Nat.* 3, p. 448. ⁵ *Flinders's Voy.* 2, p. 545. (*Antè,*

Annal. du Mus. d'Hist. Nat. 8, p. 72. ⁶ p. 16.)

these two genera seem to correspond with those of their pericarpia.

CHRYSOBALANEÆ. The genera forming this order are *Chrysobalanus*, *Moquilea*, *Grangeria*, *Coupea*, *Acioa*, *Licania*, *Hirtella*, *Thelira*, and *Parinarium*, all of which are at present referred by M. de Jussieu to Rosaceæ, and the greater part to his seventh section of that family, namely, Amygdaleæ. If Rosaceæ be considered as an order merely, these genera will form a separate section, connecting it with Leguminosæ. But if, as I have formerly proposed, both these extensive families are to be regarded as natural classes, then they will form an order sufficiently distinct from Amygdaleæ, both in fructification and habit, as well as in geographical distribution.

The principal distinguishing characters in the fructification of *Chrysobalaneæ* are the style proceeding from the base of the ovary; and the ovula (which, as in Amyg-^[434] daleæ, are two in number) as well as the embryo being erect. The greater part of *Chrysobalaneæ* have their flowers more or less irregular; the irregularity consisting in the cohesion of the foot-stalk of the ovary with one side of the tube of the calyx, and a greater number, or greater perfection of stamens on the same side of the flower.

Professor Smith's herbarium contains only two genera of this order, namely, *Chrysobalanus* and *Parinarium*.¹ One species of the former is hardly distinguishable from *Chrysobalanus Icaco* of America, and is probably a very common plant on the west coast of Africa; *Icaco* being mentioned by Isert² as a native of Guinea, and by Adanson³ in his account of Senegal.

Of *Parinarium*, there is only one species from Congo, which agrees, in the number and disposition of stamens, with the character given of the genus. In these respects M. de Jussieu⁴ has observed a difference in the two species

¹ *Juss. Gen.* 342. *Parinari*, *Aublet Guian.* 514. *Petrocarya*, *Schreb. Gen.* 629. ² *Reise nach Guinea*, p. 54. ³ *Voyage au Sénégala*, 175.

⁴ *Gen. Plant.* 342.

found by Adanson at Senegal, and has moreover remarked that their ovarium coheres with the tube of the calyx. In that species most common at Sierra Leone, and which is probably one of those examined by M. de Jussieu, the ovarium itself is certainly free, its pedicellus, however, as in the greater part of the genera of this order and several of Cæsalpineæ, firmly cohering with the calyx, may account for the statement referred to. I am not, indeed, acquainted with any instance among Dicotyledonous plants of cohesion between a simple ovarium, which I consider that of Chrysobalaneæ to be, and the tube of the calyx.

The complete septum between the two ovula of Parinarium, existing before fecundation, is a peculiar structure in a simple ovarium; though in some degree analogous to the moveable dessepiment of Banksia and Dryandra, and to the complete, but less regular, division of the cavity that takes place after fecundation in some species of Persoonia.¹

MELASTOMACEÆ. Four plants only of this order occur in the collection.

The first is a species of *Tristemma*, very nearly related to *T. hirtum* of M. de Beauvois.²

^{435]} The second is perhaps not distinct from *Melastoma decumbens*, of the same author.³

The third and fourth are new species referable to *Rhexia*, as characterised by Ventenat,⁴ though not to that genus as established by Linnæus; and in some respects differing from the species that have been since added to it, all of which are natives of America.

In the original species of *Tristemma*⁵ there are, in the upper part of the tube of the calyx, two circular ciliated membranous processes, from which the name of the genus is derived; the limb of the calyx itself being considered as constituting the third circle. The two circular membranes are also represented as complete in *T. hirtum*.

But in the species from Congo, which may be named *T.*

¹ *Linn. Soc. Transact.* 10, p. 35.

² *Flore d'Ouare*, 1, p. 94, t. 57.

³ *Op. citat.* 1, p. 69, t. 49.

⁴ *Mém. de l'Institut. sc. phys.* 1807, prem. semest. p. 11.

⁵ *Tristeinma virusana*, *Vent. Choix de Plantes*, 35.

incompletum, only one circular membrane exists, with the unilateral rudiment of the second.

The rudiment of the inferior membrane in this species points out the relation between the apparently anomalous appendage of the calyx in *Tristemma*, and the ciliated scales irregularly scattered over its whole surface in *Osbeckia*; the analogy being established by the intermediate structure of an unpublished plant of this order from Sierra Leone, in Sir Joseph Banks's herbarium, in which the nearly similar squamæ, though distinct, are disposed in a single complete circle; and by *Melastoma octandra* of Linnaeus, in which they are only four in number, and alternate with the proper divisions of the calyx.

The two species here referred, though improperly, to *Rhexia*, agree with a considerable part of the species published in the monograph of that genus by M. Bonpland, and with some other genera of the order, in the peculiar manner in which the ovary is connected with the tube of the calyx. This cohesion, instead of extending uniformly over the whole surface, is limited to ten longitudinal equidistant lines or membranous processes, apparently originating from the surface of the ovary; the interstices, which are tubular, and gradually narrowing towards the base, being entirely free.

The function of these tubular interstices is as remarkable as their existence.

In *Melastomaceæ*, before the expansion of the corolla, the tops of the filaments are inflected, and the antheræ are pendulous and parallel to the lower or erect portion of the filament; their tips reaching, either to the line of complete cohesion between the calyx and ovary, where that exists; or, where this cohesion is partial, and such as I have now [436] described, being lodged in the tubular interstices; their points extending to the base of the ovary. From these sheaths, to which they are exactly adapted, the antheræ seem to be disengaged in consequence of the unequal growth of the different parts of the filament; the inflected portion ceasing to increase in length at an early period, while that below the curvature continues to elongate con-

siderably until the extrication is complete, when expansion takes place.

It is singular that this mode of cohesion between the ovarium and calyx in certain genera of Melastomaceæ, and the equally remarkable æstivation of antheræ accompanying it, should have been universally overlooked, especially in the late monograph of M. Bonpland; as both the structure and economy certainly exist in some, and probably in the greater part, of the plants which that author has figured and described as belonging to *Rhexia*.

On the limits, structure, and generic division of Melastomaceæ, I may remark—

1st. That *Memecylon*, as M. du Petit Thouars has already suggested,¹ and *Petaloma* of Swartz² both belong to this order, and connect it with *Myrtaceæ*, from which they are to be distinguished only by the absence of the pellucid glands of the leaves and other parts, existing in all the genera really belonging to that extensive family.

2ndly. There are very few Melastomaceæ in which the ovarium does not in some degree cohere with the tube of the calyx; *Meriana*, properly so called, being, perhaps, the only exception.

And in the greater number of instances where, though the ovarium is coherent, the fruit is distinct, it becomes so from the laceration of the connecting processes already described.

3rdly. That the generic divisions of the whole order remain to be established. On examination, I believe, it will be found that the original species of the Linnean genera, *Melastoma* and *Rhexia*, possess generic characters sufficiently distinguishing them from the greater part of the plants that have been since added to them by various authors. In consequence of these additions, however, their botanical history has been so far neglected, that probably no genuine species of *Melastoma*, and certainly none of *Rhexia*, has yet been published in M. Bonpland's splendid and valuable monographs of these two genera.

¹ *Mélanges de Botanique*; *Observ. address. à M. Lamarck*, p. 57.

² *Flor. Ind. Occid.* 2, p. 831, tab. 14.

Of RHIZOPHOREÆ,¹ as I have formerly proposed to limit it, namely, to Rhizophora, Bruguiera, and Carallia, the collection contains only one plant, which is a species of Rhizophora, the Mangrove of the lower part of the river, and probably of the whole line of coast, but very different both from that of America, and from those either of India or of other equinoctial countries that have been described. There is, however, a plant in the collection which, though not strictly belonging to this order, suggests a few remarks on its affinities.

I referred *Carallia*² to Rhizophoreæ, from its agreement with them in habit, and in the structure of its flower. It is still uncertain whether its reniform seed is destitute of albumen; the absence of which, however, does not seem necessary to establish its affinity with the other genera of this order; for plants having the same remarkable economy in the germination of the embryo as that of Rhizophora, may belong to families which either have or are destitute of albumen.

The plant referred to from Congo may be considered as a new species of *Legnotis* having its petals less divided than those of the original species of that genus, and each cell of its ovary containing only two pendulous ovula. The genus *Legnotis* agrees with Carallia in habit, especially in having opposite leaves with intermediate stipules; in the valvular aestivation of its calyx, and in several other points of structure of its flower. It differs in its divided petals; in its greater number of stamens, disposed, however, in a simple series; and in its ovary not cohering with the calyx. It is therefore still more nearly related to *Richæia* of M. du Petit Thouars,³ from which perhaps it may not be generically distinct. The propriety of associating Carallia⁴ with Rhizophoreæ is not perhaps likely to be disputed; and its affinity to Legnotis, especially to the species from Congo, appears very probable. It would seem, therefore, that we have already a series of structures

¹ Flinders's Voy. 2, p. 549. (Antè, p. 20.) ² Roxburgh. Coromand. 3, p. 8, t. 211.

³ Nov. Gen. Madagasc. n. 84.

⁴ Or Barraldeia, Du Petit Thouars, Nov. Gen. Madagasc. n. 82.

connecting Rhizophora on the one hand with certain genera of *Salicariæ*, particularly with *Antherylium*, though that genus wants the intermediate stipules; and on the other with *Cunoniaceæ*,¹ especially with the simple leaved species of ^{438]} *Ceratopelatum*. While *Loranthus* and *Viscum*, associated with Rhizophora by M. de Jussieu, appear to form a very distinct family, and which, as it seems to me, should even occupy a distant place in the system.

HOMALINÆ. In the collection from Congo a plant occurs evidently allied, and perhaps referable, to *Homalium*, from which it differs only in the greater number of glands alternating with the stamina, whose fasciculi are in consequence decomposed: the inner stamen of each fasciculus being separated from the two outer by one of the additional glands. This plant was first found on the banks of the Gambia, by Mr. Park, from whose specimens I have ascertained that the embryo is enclosed in a fleshy albumen.

The same structure of seed may be supposed, from very obvious affinity, to exist in *Astranthus* of Loureiro, to which *Blackwellia* of Commerson ought perhaps to be referred; in *Napimoga* of Aublet, probably not different from *Homalium*; and in *Nisa*,² a genus admitting of subdivision, and which M. du Petit Thouars has referred to *Rhamneæ*. All these genera appear to me sufficiently different from *Rosaceæ*, where M. de Jussieu has placed them, and from every other family of plants at present established.

Their distinguishing characters as a separate order are, the segments of the perianthium disposed in a double series, or an equal number of segments nearly in the same series; the want of petals; the stamens being definite and opposite to the inner series of the perianthium, or to the alternate segments where they are disposed apparently in a simple series; the unilocular ovary (generally in some degree coherent with the calyx) having three parietal placentæ, with one, two, or even an indefinite number of ovula; and the seeds having albumen, as inferred from its existence in the genus from Congo. The cohesion of the ovary with

¹ *Flinders's Voy.* 2, p. 548. (*Antè*, p. 20.) ² *Nov. Gen. Madagasc.* n. 81.

the tube of the perianthium, though existing in various degrees in all the genera above enumerated, is probably a character of only secondary importance in Homalinæ. For an unpublished genus found by Commerson in Madagascar, which in every other respect agrees with this family, has ovarium superum. This genus at the same time seems to establish a considerable affinity between Homalinæ and certain genera, either absolutely belonging to *Passifloreæ*, especially *Paropsia* of M. du Petit Thouars,¹ or nearly related to them as *Erythrospermum*, well described and figured by the same excellent botanist.²

The increased number of stamens in Homalium, and particularly in the genus from Congo, instead of presenting an objection to this affinity, appears to me to confirm it. It may be observed also that there are two genera referable to *Passifloreæ*, though they will form a separate section of the order, which have a much greater, and even an indefinite, number of perfect stamens, namely, *Smeathmania*, an unpublished genus of equinoctial Africa, agreeing in habit, in perianthium, and in fruit, with *Paropsia*; and *Ryania* of Vahl,³ which appears to me to belong to the same family.

In *Passifloreæ* the stamens, when their number is definite, which is the case in all the genera hitherto considered as belonging to them, are opposite to the outer series of the perianthium; a character which, though of general importance, and here of practical utility in distinguishing them from Homalinæ, is not expressed in any of the numerous figures or descriptions that have been published of the plants of this order.

Passifloreæ and *Cucurbitaceæ*, though now admitted as distinct families, are still placed together by M. de Jussieu; and he considers the floral envelope in both orders as a perianthium or calyx, whose segments are disposed in a double series.⁴

These views of affinity and structure are in some degree confirmed by Homalinæ, in which both ovarium inferum

¹ *Hist. des Végét. des Isles de l'Afrique*, 59.

² *Op. citat.* 65.

³ *Elog. 1, p. 51, t. 9.*

⁴ *Annal. du Mus. d'Hist. Nat.* 6, p. 102.

and superum occur; and in one genus of which, namely, *Blackwellia*, the segments of the perianthium, though the complete number, in relation to the other genera of the order, be present, are all of similar texture and form, and are disposed nearly in a simple series. If the approximation of these three families be admitted, they may be considered as forming a class intermediate between Polypetalæ and Apetalæ, whose principal characters would consist in the segments of the calyx being disposed in a double series, and in the absence of petals; the different orders nearly agreeing with each other in the structure of their seeds, and to a considerable degree in that of the ovary.

The formation of this class, however, connected on the [440] one hand with Apetalæ by Samydeæ,¹ and on the other, though as it seems to me less intimately, with Polypetalæ by Violeæ, would not accord with any arrangement of natural orders that has yet been given. While the admission of the floral envelope being entirely calyx; and of the affinity of the class with Violeæ, would certainly be unfavorable to M. de Candolle's ingenious hypothesis of petals in all cases being modified stamina.

VIOLEÆ.² This order does not appear to me so nearly related to Passifloreæ as M. du Petit Thouars is disposed to consider it; for it not only has a genuine poly-petalous corolla, which is hypogynous, but its antheræ differ materially in structure, and its simple calyx is divided to the base. The irregularity both of petals and stamina in the original genera of the order, namely, *Viola*, *Pom-balia*,³ and *Hybanthus*, though characters of considerable importance, are not in all cases connected with such a difference in habit as to prevent their union with certain regular flowered genera, which it has lately been proposed to associate with them.

The collection from Congo contains two plants belonging to the section of Violeæ with regular flowers. One of

¹ *Ventenat* in *Mém. de l'Instit. Sc. Phys.* 1807, 2 sem. p. 142.

² *Juss. Gen. Pl.* 295. *Ventenat Malmais*, 27.

³ *Vandelli Fasc. Pl.* p. 7, t. 1. *Ionidium, Venten. Malmais.* 27.

these evidently belongs to *Passalia*, an unpublished genus in Sir Joseph Banks's herbarium, and described in the manuscripts of Solander from a plant found by Smeathman at Sierra Leone, which is perhaps not specifically distinct from that of Congo, or from *Ceranthera dentata* of the Flore d'Oware. But *Ceranthera*,¹ which M. de Beauvois, being unacquainted with its fruit, has placed in the order Meliaceæ, is not different from *Alsodeia*, a genus published somewhat earlier, and from more perfect materials, by M. du Petit Thouars,² who refers it to Violeæ. The latter generic name ought of course to be adopted, and with a change in the termination (*Alsodinæ*) it may also denote the section of this order with regular flowers.

Physiphora of Sir Joseph Banks's herbarium, discovered by himself in Brazil, differs from *Alsodeia* only in its filaments being very slightly connected at base, and in the form and texture of its capsule, which is membranaceous, and, as the name imports, inflated.

Five species belonging to this section of Violeæ occur in Aublet's History of the Plants of Guiana, where each of [44] them is considered as forming a separate genus. Of three of these genera, namely, *Conohoria*, *Rinorea*, and *Riana* the flowers alone are described ; the two others, *Passura* and *Piparea*, were seen in fruit only.

From the examination of flowers of Aublet's original specimens of the three former genera, in Sir Joseph Banks's herbarium, and of the fruit of *Conohoria*, which entirely agrees with that of *Passura*, and essentially with that of *Piparea*, I have hardly a doubt of these five plants, notwithstanding some differences in the disposition of their leaves, actually belonging to one and the same genus ; and as they agree with *Physiphora* in every respect, except in the texture and form of the capsule, and with the *Passalia* of Sierra Leone and Congo, except in having their stamens nearly or entirely distinct, it appears that all these genera may be referred to *Alsodeia*.

I have also examined, in Sir Joseph Banks's herbarium, a specimen of *Pentaloba sessilis* of the Flora Cochinchinensis.

¹ Flore d'Oware, 2, p. 10.

² Hist. des Végét. des Isles de l'Afrique, 55.

nensis, which was sent so named, by Loureiro himself, and have found it to agree in every important point with Alsodeia, even as to the number of parietal placentæ. Loureiro, however, describes the fruit of Pentaloba as a five-lobed, five-seeded berry, and if this account be correct, the genus ought to be considered as distinct; but if, which is not very improbable, the fruit be really capsular, it is evidently referable to Alsodeia; with the species of which, from Madagascar and the west coast of equinoctial Africa, it agrees in the manifest union of its filaments.

It appears therefore that the ten genera now enumerated, and perhaps also *Lauradia* of Vandelli, may very properly be reduced to one; and they all at least manifestly belong to the same section of Violeæ, though at present they are to be found in various, and some rather distant, natural orders.

M. de Jussieu, in adopting Aublet's erroneous description of the stamens of Rinorea and Conohoria, has referred both these genera to Berberides,¹ to which he has also annexed Riana, adding a query whether Passura may not ^{442]} belong to the same genus. With M. de Beauvois, he refers Ceranthera to Meliaceæ; and Pentaloba of Loureiro he reduces also to the same order.² Piparea is, together with Viola, annexed to Cistinæ in his Genera Plantarum, and is therefore the most correctly placed, though its structure is the least known, of all these supposed genera.

¹ The genera belonging to BERBERIDEÆ are *Berberis* (to which *Ilex Japonica* of Thunberg belongs); *Leontice* (including *Caulophyllum*, respecting which see *Linn. Soc. Transac.* 12, p. 145) *Epimedium*; and *Diphyllaea* of Michaux. *Jeffersonia* may perhaps differ in the internal structure of its seeds, as it does in their arillus, from true Berberideæ, but it agrees with them in the three principal characters of their flower, namely, in their stamens being equal in number and opposite to the petals; in the remarkable dehiscence of antheræ; and in the structure of the ovary. *Podophyllum* agrees with Diphyllaea in habit, and in the fasciculi of vessels of the stem being irregularly scattered; essentially in the floral envelope, and in the structure of the ovary; its stamens, also, though numerous, are not altogether indefinite, but appear to have a certain relation both in number and insertion to the petals: in the dehiscence of antheræ, and perhaps also in the structure of seeds, it differs from this order, to which, however, it may be appended. *Nandina* ought to be included in Berberideæ, differing only in its more numerous and densely imbricate bractæ, from which to the calyx and even to the petals, the transition is nearly imperceptible; and in the dehiscence of its antheræ.

² *Mém. du Mus. d'Hist. Nat.* 3, p. 440.

An unpublished genus of New Holland, which I have named *Hymenanthera*, in Sir Joseph Banks's herbarium, agrees with *Alsodeia* in its calyx, in the insertion, expansion, and obliquely imbricate aestivation of its petals, and especially in the structure of its antheræ, which approach more nearly to those of *Violeæ* properly so called. It differs, however, from this order in having five squamæ alternating with the petals; and especially in its fruit, which is a bilocular berry, having in each cell a single pendulous seed, whose internal structure resembles that both of *Violeæ* and *Polygaleæ*, between which I am inclined to think this genus should be placed.

CHAILLETEÆ. The genus *Chailletia* was established by M. de Candolle¹ from a plant found by Martin in French Guiana, and which, as appears by specimens in Sir Joseph Banks's herbarium, had been many years before named *Patrisia* by Von Rohr, who discovered it in the same country. At a still earlier period, Solander, in his manuscripts, preserved in the library of Sir Joseph Banks, described this genus under the name of *Mestotes*, from several species found by Smeathman at Sierra Leone. Both *Dichapetalum* and *Leucosia* of M. du Petit Thouars² appear to me, from the examination of authentic specimens, to belong to the same genus; and in Professor Smith's herbarium there is at least one additional species of Chailletia different from those of Sierra Leone.

Of the two generic names given by M. du Petit ^[443] Thouars, and published somewhat earlier than M. de Candolle's Memoir, *Leucosia* will probably be considered inadmissible, having been previously applied by Fabricius to a genus of Crustacea; and *Dichapetalum* is perhaps objectionable, as derived from a character not existing in the whole genus, even allowing it to be really polypetalous. It seems expedient, therefore, to adopt the name proposed by M. de Candolle, who has well illustrated the genus in the memoir referred to. It appears to me that Chailletia,

¹ *Annal. du Mus. d'Hist. Nat.* 17, p. 153.

² *Nor. Gen. Madagasc.* n. 78 et 79.

a genus nearly related to it from India with capsular fruit, and *Tapura* of Aublet (which is *Rohria* of Schreber), form a natural order, very different from any yet established. The principal characters of this order may be gathered from M. de Candolle's figure and description of *Chailletia*, to which, however, must be added that the cells of the ovarium, either two or three in number, constantly contain two collateral pendulous ovula; and that in the regular flowered genera there exist within, and opposite to, the petal-like bodies an equal number of glands, which are described by M. du Petit Thouars in *Dichapetalum*, but are unnoticed by him in *Leucosia*, where, however, they are equally present.

It may seem paradoxical to associate with these genera *Tapura*, whose flower is irregular, triandrous, and apparently monopetalous. But it will somewhat lessen their apparent differences of structure to consider the petal-like bodies, which, in all the genera of this order, are inserted nearly or absolutely in the same series with the filaments, as being barren stamina; a view which M. de Candolle has taken of those of *Chailletia*, and which M. Richard had long before published respecting *Tapura*.¹ It is probable also that M. de Candolle at least will admit the association here proposed, as his *Chailletia sessiliflora* seems to be merely an imperfect specimen of *Tapura guianensis*.

The genera to which Chailleteæ most nearly approach appear to me to be *Aquilaria* of Lamarck² and *Gyrinops* of Gærtner. But these two genera themselves, which are not referable to any order yet established, may either be regarded as a distinct family, or perhaps, to avoid the too great multiplication of families, as a section of that at present [44] under consideration, and to which I should then propose to apply the name of AQUILARINÆ in preference to Chailleteæ.

The genus *Aquilaria* itself has been referred by Ventenat to *Samydeæ*. From this order, however, it is sufficiently

¹ *Dict. Elem. de Botanique par Bulliard, revu par L. C. Richard, ed. 1802,* p. 34.

² Or *Ophiospermum* of the Flora Cochininchensis, as I have proved by comparison with a specimen from Loureiro himself.

distinct, not only in the structure of its ovary and seeds, but in its leaves being altogether destitute of glands, which are not only numerous in Samydeæ, but consisting of a mixture of round and linear pellucid dots, distinguish them from all the other families¹ with which there is any probability of their being confounded.

Sir James Smith² has lately suggested the near affinity of Aquilaria to Euphorbiaceæ. But I confess it appears to me at least as distinct from that order as from Samydeæ; and I am inclined to think, paradoxical as it may seem, that it would be less difficult to prove its affinity to Thymeleæ than to either of them; a point, however, which, requiring considerable details, I do not mean to attempt in the present essay.

Of EUPHORBIACEÆ there are twenty species in the collection, or one twenty-eighth part of its Phænogamous plants. This is somewhat greater than the intratropical proportion of the order as stated by Baron Humboldt, but rather smaller than that of India or of the northern parts of New Holland.

The most remarkable plants of Euphorbiaceæ in the Congo herbarium are: a new species of the American genus *Alchornea*; a plant differing from *Aegopricon*, a genus also belonging to America, chiefly in its capsular fruit; two new species of *Bridelia*, which has hitherto been observed only in India; and an unpublished genus that I have formerly alluded to,³ as in some degree explaining the real structure of *Euphorbia*, and from the consideration of which also it seems probable that what was formerly described as the hermaphrodite flower of that genus, is in reality a compound fasciculus of flowers.⁴ From the same species of this unpublished genus a substance resembling caoutchouc is said to be obtained at Sierra Leone.

¹ The only other genus in which I have observed an analogous variety of form in the glands of the leaves, is *Myroxylon* (to which both *Myrospermum* and *Toluifera* belong), in all of whose species this character is very remarkable, the pellucid lines being much longer than in Samydeæ.

² *Linn. Soc. Transact.* 11, p. 230. ³ *Flinders's Voy.* 2, p. 557. (*Ante*, p. 29.)

⁴ *Linn. Soc. Transact.* 12, p. 99.

According to Mr. Lockhart a frutescent species of ^{445]} *Euphorbia*, about eight feet in height, with cylindrical stem and branches, was observed, planted on the graves of the natives near several of the villages ; but of this, which may be what Captain Tuckey has called *Cactus quadrangularis* in his Narrative (p. 115), there is no specimen in the herbarium.

COMPOSITÆ. It is unnecessary here to enter into the question whether this family of plants, of which upwards of 3000 species are already known, ought to be considered as a class or as an order merely ; the expediency of subdividing it, and affixing proper names to the divisions, being generally admitted. The divisions or tribes proposed by M. Cassini, in his valuable dissertations on this family, appear to be the most natural, though as yet they have not been very satisfactorily defined.

The number of Compositæ in the collection is only twenty-four, more than half of which are referable to *Heliantheæ* and *Vernoniaceæ* of M. Cassini. The greater part of these are unpublished species, and among them are five new genera. The published species belong to other divisions, and are chiefly Indian : but one of them, *Ageratum conyzoides*, is common to America and India ; the *Struchium* (or *Sparganophorus*) of the collection does not appear to me different from that of the West Indies ; and *Mikania chenopodifolia*, a plant very general on this line of coast, though perhaps confined to it, belongs to a genus of which all the other species are found only in America.

Baron Humboldt has stated¹ that Compositæ form one sixth of the Phænogamous plants within the tropics, and that their proportion gradually decreases in the higher latitudes until in the frigid zones it is reduced to one thirteenth. But in the herbarium from Congo Compositæ form only one twenty-third, and both in Smeathman's collection from Sierra Leone and in Dr. Roxburgh's Flora Indica, a still smaller part, of the Phænogamous plants. In the northern part of New Holland they form about one

¹ In *op. citat.*

sixteenth; and in a manuscript catalogue of plants of equinoctial America, in the library of Sir Joseph Banks, they are nearly in the same proportion.

In estimating the comparative value of these different materials, I may, in the first place, observe that though the herbarium from Congo was collected in the dry season of the country, there is no reason to suppose on that account that the proportion of this family of plants, in particular, is materially or even in any degree diminished, nor can ~~it~~ this objection be stated to the Sierra Leone collection, in which its relative number is still smaller.

To the Compositæ in Dr. Roxburgh's Flora Indica, however, a considerable addition ought, no doubt, to be made ; partly on the ground of his having apparently paid less attention to them himself, and still more because his correspondents, whose contributions form a considerable part of the Flora, have evidently in a great measure neglected them. This addition being made, the proportion of Compositæ in India would not differ very materially from that of the north coast of New Holland, according to my own collection, which I consider as having been formed in more favorable circumstances, and as probably giving an approximation of the true proportions in the country examined. Baron Humboldt's herbarium, though absolutely greater than any of the others referred to on this subject, is yet, with relation to the vast regions whose vegetation it represents, less extensive than either that of the north coast of New Holland, or even of the line of the Congo. And as it is in fact as much the Flora of the Andes as of the coasts of intratropical America, containing families nearly or wholly unknown on the shores of equinoctial countries, it may be supposed to have several of those families which are common to all such countries, and among them Compositæ, in very different proportion. At the same time it is not improbable that the relative number of this family in equinoctial America, may be greater than in the similar regions of other intratropical countries ; while there seems some reason to suppose it considerably smaller on the west coast of Africa. This diminished

proportion, however, in equinoctial Africa would be the more remarkable, as there is probably no part of the world in which Compositæ form so great a portion of the vegetation as at the Cape of Good Hope.

RUBIACEÆ. Of this family there are forty-three species in the collection, or about one fourteenth of its Phænogamous plants. I have no reason to suppose that this proportion is greater than that existing in other parts of equinoctial Africa; on the contrary, it is exactly that of Smeathman's collection from Sierra Leone.

Baron Humboldt, however, states the equinoctial proportion of Rubiaceæ to phænogamous plants to be one to twenty-nine, and that the order gradually diminishes in relative number towards the poles.

^{417]} But it is to be observed that this family is composed of two divisions, having very different relations to climate; the *first*, with opposite, or more rarely verticillate, leaves and intermediate stipules, to which, though constituting the great mass of the order, the name Rubiaceæ cannot be applied, being chiefly equinoctial; while the *second*, or *Stellatæ*, having verticillate or very rarely opposite leaves, but in no case intermediate stipules, has its maximum in the temperate zones, and is hardly found within the tropics, unless at great heights.

Hence perhaps we are to look for the minimum in number of species of the whole order, not in the frigid zone, but, at least in certain situations, a few degrees only beyond the tropics.

In conformity to this statement, M. Delile's valuable catalogue of the plants of Egypt¹ includes no indigenous species of the equinoctial division of the order, and only five of *Stellatæ*, or hardly the one hundred and sixtieth part of the Phænogamous plants. In M. Desfontaines' Flora Atlantica, Rubiaceæ, consisting of fifteen *Stellatæ* and only one species of the equinoctial division, form less than one ninetieth part of the Phænogamous plants, a proportion somewhat inferior to that existing in Lapland.

¹ *Flor. Egypt. Illustr. in Descript. de l'Egypte, Hist. Nat. v. 2, p. 49.*

In Professor Thunberg's Flora of the Cape of Good Hope, where Rubiaceæ are to Phænogamous plants as about one to one hundred and fifty, the order is differently constituted; the equinoctial division, by the addition of *Anthospermum*, a genus peculiar to southern Africa, somewhat exceeding Stellatae in number. And in New Holland, in the same parallel of latitude, the relative number of Stellatae is still smaller, from the existence of *Opercularia*, a genus found only in that part of the world, and by the addition of which the proportion of the whole order to the Phænogamous plants is there considerably increased.

More than half the Rubiaceæ from Congo belong to well known genera, chiefly to *Gardenia*, *Psychotria*, *Morinda*, *Hedyotis*, and *Spermacoce*.

Of the remaining part of the order, several form new genera.

The *first* of these is nearly related to *Gardenia*, which itself seems to require subdivision.

The *second* is intermediate between *Rondeletia* and *Danais*, and probably includes *Rondeletia febrifuga* of Afzelius.¹

The *third* has the inflorescence and flowers of *Nauclea*,² but its ovaria and pericarpia are confluent, the whole head forming a compound spherical fleshy fruit, which is, I suppose, the country-fig of Sierra Leone, mentioned by Professor Afzelius.³

The *fourth* is a second species of *Neurocarpæa*, a genus which I have named, but not described, in the catalogue of Abyssinian plants appended to Mr. Salt's Travels.³

The *fifth* genus is intermediate between Rubiaceæ and Apocineæ. With the former it agrees in habit, especially in its interpetiolar stipules; and in the insertion and structure of its seeds, which are erect, and have the embryo lodged in a horny albumen forming the mass of the nucleus; while it resembles Apocineæ in having its

¹ In *Herb. Banks*. This is the "New sort of Peruvian Bark" mentioned in his Report, p. 174; which is probably not different from the Bellenda or African Bark of Winterbottom's Account of Sierra Leone, vol. 2, p. 243.

² *Sierra Leone Report* for 1794, p. 171, n. 32.

³ *Voyage to Abyssinia*, append. p. lxiv. (*Anlè*, p. 94.)

ovarium entirely distinct from the calyx ; its capsule in appearance and dehiscence is exactly like that of *Bursaria*.

The existence of this genus tends to confirm what I have formerly asserted respecting the want of satisfactory distinguishing characters between these two orders, and to prove that they belong to one natural class ; the ovarium superum approximating it to *Apocineæ* ; the interpetiolar stipules and structure of seeds connecting it, as it appears to me, still more intimately with *Rubiaceæ*.

The arguments adduced by M. de Jussieu¹ for excluding *Usteria* from *Rubiaceæ* and referring it to *Apocineæ*, are, its having ovarium superum, an irregular corolla, fleshy albumen, and only one stamen ; there being no example of any reduction in the number of stamina in *Rubiaceæ*, (in which *Opercularia* and *Pomax* are not included by M. de Jussieu) while one occurs in the male flowers of *Ophiophyllum*, a genus belonging to *Apocineæ*. From analogous reasoning he at the same time decides in referring *Gærtnera* of Lamarck² to *Rubiaceæ*, though he admits it to have ovarium superum ; its flowers being regular, its albumen more copious and horny, and its embryo erect. But all these characters exist in the new genus from Congo. These two genera therefore, together with *Pagamea* of Aublet, *Usteria*, *Geniostoma* of Forster (which is *Anasser* of Jussieu) and *Logania*,³ might, from their mere agreement in the situation of ovarium, form a tribe intermediate between *Rubiaceæ* and *Apocineæ*. This tribe, however, would not be strictly natural, and from analogy with the primary divisions admitted in *Rubiaceæ*, as well as from habit, would require subdivision into at least four sections : but hence it may be concluded that the only combining character of these sections, namely, ovarium superum, is here of not more than generic value ; and it must be admitted also that the existence or absence of stipules is in *Logania*⁴ of still less importance.

¹ *Annal. du Mus. d'Hist. Nat.* 10, p. 323.

³ *Prodr. Flor. Nov. Holl.* 1, p. 455.

² *Illustr. Gen. tab.* 167.

⁴ *Prodr. Flor. Nov. Holl.* 1, p. 455.

APOCINEÆ. There are only six plants in the collection belonging to this order.

The *first* of these, together with some other species from Sierra Leone, constitutes an unpublished genus, the fruit of which externally resembles that of *Cerbera*, but essentially differs from it in its internal structure being polyspermous. The Cream fruit of Sierra Leone, mentioned by Professor Afzelius,¹ probably belongs to this genus, of which an idea may be formed by stating its flower to resemble that of *Vahea*, figured, but not described by M. Lamarck,² and its fruit, that of *Voacanga*³ of M. du Petit Thouars, from which birdlime is obtained in Madagascar, or of *Ueceola*⁴ of Dr. Roxburgh, the genus that produces the caoutchouc of Sumatra.

The *second* belongs to a genus discovered in Sierra Leone by Professor Afzelius, who has not yet described it, but has named it *Anthocleista*. This genus, however, differs from *Potalia* of Aublet (the Nicandra of Schreber) solely in having a four-celled berry; that of *Potalia* being described both by Aublet and Schreber as trilocular, though according to my own observations it is bilocular. M. de Jussieu has appended *Potalia* to his Gentianeæ, partly determined, perhaps, from its being described as herbaceous. The species of *Anthocleista* from Congo, however, according to the account given me by Mr. Lockhart, the gardener of the expedition, is a tree of considerable size, and its place in the natural method is evidently near *Fagrea*.

Whether these genera should be united with Apocineæ or only placed near them, forming a fifth section of the intermediate tribe already proposed, is somewhat doubtful.

In the perfect hermaphrodite flowers of Apocineæ, no exception occurs either to the quinary division of the [450] floral envelopes and corresponding number of stamens, or to the bilocular or double ovary; and in Asclepiadeæ, which are generally referred by authors to the same order, something like a necessary connection may be perceived

¹ *Sierra Leone Report*, 1794, p. 173, n. 47.

³ *Nov. Gen. Madagasc.*, n. 32.

² *Illustr. Gen. tab.* 169.

⁴ *Asiat. Resear.* 5, p. 169.

between these relative numbers of stamens and pistilla, and the singular mode of fecundation in this tribe. But in Potalia and Anthocleista, there is a remarkable increase in the number of stamens and segments of the corolla, and at the same time a reduction in the divisions of the calyx. The pistillum in Potalia, however, if my account of it be correct, agrees in division with that of Apocineæ; and the deviation from this division in Anthocleista is only apparent; the ovary, according to the view I have elsewhere given of this organ,¹ being composed of two united ovaria, again indeed subdivided by processes of the placenta, but each of the subdivisions or partial cells containing only one half of an ordinary placenta, and that not originating from its inner angle, as would be the case were the ovary composed of four confluent organs.

Of ASCLEPIADEÆ there are very few species in the collection, and none of very remarkable structure. The *Periploca* of Equinoctial Africa alluded to in my essay on this family,² was one of the first plants observed by Professor Smith at the mouth of the river; and a species of *Oxystelma*, hardly different from *O. esculentum* of India,³ was found, apparently indigenous, on several parts of its banks.

The ACANTHACEÆ of the collection, consisting of sixteen species, the far greater part of which are new, have a much nearer relation to those of India than to the American portion of the order. Among these there are several species of *Nelsonia*⁴ and *Hypoestes*;⁵ a new species of *Aethilema*,⁶ a genus from which perhaps *Phaylopsis* of Willdenow is not different, though its fruit is described by Wendland⁷ as a legumen, and by Willdenow, with almost equal impropriety, as a siliqua; a plant belonging to a

¹ *Linn. Soc. Transact.* 12, p. 89.

² *Wernerian Nat. Hist. Soc. Trans.* 1, p. 40.

³ *Periploca esculenta*, *Roxb. Coromand.* 1, p. 13, t. 11.

⁴ *Prodr. Flor. Nov. Holl.* 1, p. 480.

⁵ *Op. citat.* 1, p. 474.

⁶ *Prodr. Flor. Nov. Holl.* 1, p. 478.

⁷ *Micranthus*, *Wend. Botan. Beobacht.*, 38.

genus I have formerly alluded to as consisting of *Ruellia uliginosa* and *R. balsamea*,¹ and a new species of *Ble-* [45] *pharis*. All these genera exist in India, and none of them have yet been found in America.

CONVOLVULACEÆ. The herbarium of Professor Smith contains twenty-two species of this order, among which, however, there is no plant that presents anything remarkable in its structure; the far greater part belonging to *Ipomœa*, the rest to *Convolvulus*.

In the herbarium there is a single species of *Hydrolea*, nearly related to *Sagonea palustris* of Aublet, which would also be referred to this order by M. de Jussieu. But *Hydrolea*² appears to me to constitute, together with *Nama*, a distinct family (*Hydroleæ*) more nearly approaching to *Polemoniaceæ* than to *Convolvulaceæ*.

SCROPHULARINÆ. The collection contains only ten plants of this family, of which two form new genera, whose characters depend chiefly on the structure of antheræ and form of corolla.

The **LABIATÆ** of the herbarium consist of seven species, three of which belong to *Ocymum*, a genus common to equinoctial Asia and Africa, but not extending to America; an equal number to *Hyptis*, which is chiefly American, and has not been observed in India; the seventh is a species of *Hoslundia*, a genus hitherto found only on the west coast of Africa, and which, in its inflorescence and in the verticillate leaves of one of its species, approaches to the following order.

VERBENACEÆ, together with Labiateæ form one natural class,³ for the two orders of which it has already become difficult to find distinguishing characters.

In the Congo herbarium there are seven Verbenaceæ, consisting of three beautiful species of *Clerodendron*; two

¹ *Prodr. Flor. Nov. Holl.* 1, p. 478.

² *Vid. op. citat.*, p. 482.

³ *Flinders' Voy.* 2, p. 565. (*Antè*, p. 38)

new species of *Vitex*; *Stachytarpheta indica* of Vahl; and a new species of *Lippia*, which, from its habit and structure, confirms the union of *Zapania* with that genus, suggested by M. Richard.¹ This species from the Congo has its leaves in threes, and has nearly the same fragrance as ^{452]} *Verbena triphylla*, whose affinity to *Lippia*, notwithstanding the difference in calyx and inflorescence, is further confirmed by a peculiarity in the aestivation of its corolla, which extends only to *Lippia* and *Lantana*.

OLACINÆ. The herbarium contains a species of *Olax* differing from all the plants at present referred to that genus, in its calyx not being enlarged after fecundation, but in its original annular form surrounding the base only of the ripe fruit. The existence of this species, which agrees with those of New Holland and with *Fissilia* of Commerson in having only five petals, and in its barren stamens being undivided, while in habit it approaches rather more nearly to the original species *O. Zeylanica* and to *O. scandens* of Roxburgh, both of which I have examined, seems to confirm the union I have formerly proposed,² of all these plants into one genus. When I first referred *Fissilia* to this genus, I only presumed from the many other points of agreement that it had also the same structure of ovary, on which, not only the generic character of *Olax*, but its affinities, seemed to me in a great measure to depend. M. Mirbel, however, has described the ovary of *Fissilia* as trilocular.³ I can only reconcile this statement with my own observations, by supposing him to have formed his opinion from a view of its transverse section; for on examining one of Commerson's specimens of *Fissilia disparilis*, communicated by M. de Jussieu, I have found its ovary, like that of all the species of *Olax*, to be really unilocular; the central columnar placenta, at the top of which the three pendulous ovula are inserted, having no connection whatever with the sides of the cavity.

It was chiefly the agreement of *Olax* and *Santalaceæ* in

¹ In *Mich. Flor. Bor. Amer.* 2, p. 15.

² *Prodr. Flor. Nov. Holl.* 1, p. 357.

³ *Nouv. Bullet.* 3, p. 378.

this remarkable, and I believe, peculiar structure of ovary, that induced me to propose, not their absolute union into one family, but their approximation in the natural series. I at the same time,¹ however, pointed out all the objections that M. de Jussieu has since stated to this affinity.²

Of these objections the two principal are the double floral envelope and ovarium superum of *Olax*, opposed to the simple perianthium and ovarium inferum in *Santalaceæ*.

The first objection loses much of its importance, both on considering that *Quinchamalium*, a genus in every other respect resembling *Thesium*, has an outer floral envelope surrounding its ovary, and having more the usual appearance of calyx than that of *Olax*; and also in adverting to the generally admitted association of *Loranthus* and *Viscum*, of which the former is provided with both calyx and corolla, the latter, in its male flowers at least, with only a single envelope, and that analogous to the corolla of *Loranthus*.³

The second objection seems to be equally weakened by the obvious affinity of *Santalaceæ* to *Exocarpus*, which has not only ovarium superum, but the fleshy receptacle of whose fruit, similar to that of *Taxus*, perfectly resembles, and may be supposed in some degree analogous to, the enlarged calyx of certain species of *Olax*.

To these objections M. de Jussieu has added a third, which, were it well founded, would be more formidable than either of them, namely, that the ovary of *Santalaceæ* is monospermous;⁴ a statement, however, which I conclude must have proceeded from mere inadvertency.

URTICEÆ. In the collection the plants of this family, taking it in the most extensive sense, and considering it as a class rather than an order, belong chiefly to *Ficus*, of which there are seven species. One of these is very nearly related to *Ficus religiosa*; and like that species in India, is regarded as a sacred tree on the banks of the Congo.

¹ *Prodr. Flor. Nov. Holl.* 1, p. 351. *Flinders' Voy.* 2, p. 571-2. (*Antè*, p. 44.)

² *Mém. du Mus. d'Hist. Nat.* 2, p. 439.

³ *Prodr. Flor. Nov. Holl.* 1, p. 352.

⁴ *Mem. du Mus. d'Hist. Nat.* 2, p. 439.

A remarkable tree, called by the natives *Musanga*, under which name it is repeatedly mentioned in Professor Smith's Journal, forms a genus intermediate between *Coussapoa* of Aublet and *Cecropia*; agreeing with the latter in habit, and differing from it chiefly in the structure and disposition of its monandrous male flowers, and in the form of its female aments.

In the inflorescence, and even in the structure of its male flowers, *Musanga* approaches very nearly to *Myrianthus* of M. de Beauvois,¹ which it also resembles in habit. But the fruit of *Myrianthus*, as given in the 'Flore d'Oware,' is totally different, and, with relation to its male flowers, so remarkable, that a knowledge of the female flowers is wanting to fix our ideas both of the structure and affinities of the genus. This desideratum the expedition to Congo has not supplied, the male plant only of *Myrianthus* having been observed by Professor Smith.

^{454]} In *Artocarpeæ*, to which *Musanga* belongs, and in *Urticeæ* strictly so called, the ovulum, which is always solitary, is erect, while the embryo is inverted or pendulous. By these characters, as well as by the separation of sexes, they are readily distinguished from those genera of *Chenopodeæ* and of monospermous *Illecebreae*,² in which the albumen is either entirely wanting or bears but a small proportion to the mass of the seed. And hence also *Celtis* and *Mertensia*,³ in both of which the ovulum is pendulous, are to be excluded from *Urticeæ*, where they have been lately referred by M. Kunth. The same characters, of the erect ovulum and inverted embryo, characterise *Polygonæ*,⁴ as I have long since remarked, and exist in *Piperaceæ* and even in *Coniferæ*, if my notions of that remarkable family be correct. But from all those orders *Urticeæ* are easily distinguished by other obvious and important differences in structure.

PHYTOLACEÆ. In describing *Chenopodeæ*, in the

¹ *Flore d'Oware* 1, p. 16, tabb. 11 et 12.

² *Prodr. Flor. Nov. Holl.* 1, pp. 405, 413, et p. 416. *Paronychiarum* sect. ii. *Jussieu in Mém. du Mus. d'Hist. Nat.* 2, p. 388.

³ *Nov. Gen. et Sp. Pl. Orb.* Nov, 2, p. 30.

⁴ *Prodr. Flor. Nov. Holl.* 1, p. 419.

Prodromus Floræ Novæ Hollandiae, I had it particularly in view to exclude *Phytolacca*, *Rivina*, *Microtea*, and *Petiveria*, which I even then considered as forming the separate family now for the first time proposed.

In *Chenopodeæ* the stamina never exceed in number the divisions of the perianthium, to which they are opposite. In *Phytolaceæ* they are either indefinite, or when equal in number to the divisions of the perianthium, alternate with them. This disposition of stamens in *Phytolaceæ*, however, uniting genera with fruits so different as those of *Phytolacca* and *Petiveria*, it would be satisfactory to find in the same order a structure intermediate between the multilocular ovary of the former and the monospermous ovary, with lateral stigma, of the latter.

Two plants in the herbarium from Congo assist in establishing this connection.

The first is a species of *Phytolacca*, related to *P. abyssinica*, whose quinquelocular fruit is so deeply divided, that its lobes cohere merely by their inner angles, and I believe ultimately separate.

The second is a species of *Gisekia*, a genus in which the five ovaries are entirely distinct. This genus is placed by ¹⁴⁵ M. de Jussieu in *Portulacaceæ*; but the alternation of its stamens with the segments of the perianthium, a part of its structure never before adverted to, as well as their insertion, seem to prove its nearer affinity to *Phytolacca*.¹

Still, however, the lateral stigma, the spiral cotyledons, and want of albumen in *Petiveria*, remove it to some distance from the other genera of *Phytolaceæ*, and at the same time connect it with *Seguieria*, with which also it agrees in the alliaceous odour of the whole plant.

The affinity of *Seguieria* has hitherto remained undetermined, and is here proposed from the examination of three species lately discovered in Brazil, one of which has

¹ *Ancistrocarpus* of M. Kunth (*Nov. Gen. et Sp. Pl. Orb. Nov. 2*, p. 186) belongs to *Phytolaceæ*, though its stamens are described to be opposite to the segments of the calyx: and it is not improbable that *Miltus* of Loureiro (*Flor. Cochin.* p. 302) whose habit, according to the description, is that of *Gisekia*, from which it differs nearly as *Ancistrocarpus* does from *Microtea*, or *Rivina octandra* from the other species of its genus, may also belong to this order.

exactly the habit of *Rivina octandra*, and all of which agree with that plant, as well as with several others belonging to the order, in the very minute pellucid dots of their leaves.

Petiveria and *Seguieria* may therefore form a sub-division of *Phytolaceæ*. And another section of this order exists in New Holland, of which the two genera differ from each other in number of stamens as remarkably as *Petiveria* and *Seguieria*.

Of the Monocotyledonous orders, the first on which I have any remarks to offer, is that of

PALMÆ. The collection, however, contains no satisfactory specimens of any plant of this family except of *Elæis guineensis*, the *Maba* of the natives, or Oil Palm, which appears to be common along the whole of this line of coast. In Professor Smith's journal it is stated that a single plant of the Maba Palm¹ was cut down, from which Mr. Lockhart informs me that both the male and female spadices preserved in the collection were obtained. This fact seems to decide that *Elæis* is monococious, which, in ⁴⁵⁶ deed, Jacquin, by whom the genus was established, concluded it to be, though from less satisfactory evidence.² It was first described as dioecious by Gærtner, whose account has been adopted, probably without examination, by Schreber, Willdenow, and Persoon.

In Sir Joseph Banks's collection, however, from which Gærtner received the fruits he has described and figured, and where he may be supposed to have likewise obtained all the original information he had on the subject, there is no proof of the male and female spadices of *Elæis guineensis* belonging to different individuals.

Gærtner has fallen into a still more important mistake respecting the structure of the fruit of *Elæis*, the foramina of whose putamen, which are analogous to those of the

¹ *Maba* is, perhaps, rather applied to the fruit than to the tree: *Emba* being, according to Merolla, the name of the single nut, and *Cachio* that of the entire cluster: for the Palm itself, he has no name. *Vide Piccardo Relaz. p. 122.*

² *Hist. Stirp. Amer. p. 281.*

cocoa nut, being, according to his description, at the base, as in that genus, whereas they are actually at the apex. It is probable that *Alfonsia oleifera* of Humboldt Bonpland and Kunth, belongs to *Elæis*, and possibly it may not even differ from the African species.

It is a remarkable fact respecting the geographical distribution of *Palmae*, that *Elæis guineensis*, which is universally, and I believe justly, considered as having been imported into the West India colonies from the west coast of Africa, and *Cocos indica*, which there is no reason to doubt is indigenous to the shores of equinoctial Asia and its islands, should be the only two species of an extensive and very natural section of the order, that are not confined to America.

To this section, whose principal character consists in the originally trilocular putamen having its cells when fertile perforated opposite to the seat of the embryo, and when abortive indicated by foramina cæca, as in the Cocoa nut, the name *Cocoinæ* may be given; though it has been applied by M. Kunth¹ to a more extensive and less natural group, which includes all palms having trilocular ovaria, and the surface of whose fruit is not covered with imbricate scales. I may also remark that from the fruits of *Cocoinæ* only, as I have here proposed to limit the section, the oil afforded by plants of this family, is obtained.

Professor Smith in his journal frequently mentions a species of *Hyphæne*, by which he evidently intended the palm first seen abundantly at the mouth of the river, and afterwards occasionally in the greater part of its course, especially near the Banzas, where it is probably planted for the sake of the wine obtained from it.

According to the gardener's information, this is a palm [457] of moderate height with fan-shaped fronds and an undivided caudex. It therefore more probably belongs to *Corypha* than to Gærtner's *Hyphæne*, one species of which is the *Cucifera* of Delile, the *Doom* of Upper Egypt; the second, *Hyphæne coriacea*, is a native of Melinda, and

¹ *Nova Gen. et Sp. Orb. Nov.* 1, p. 241.

probably of Madagascar, and both are remarkable in having the caudex dichotomous, or repeatedly divided.

As the Palm on the banks of the Congo was seen in fruit only, it is not difficult to account for Professor Smith's referring it rather to *Hyphæne* than to *Corypha*; Gærtner having described the embryo of the latter as at the base of the fruit, probably, however, from having inverted it, as he appears to have done in *Elæis*. It is at least certain that in *Corypha Taliera*¹ of the continent of India, which is very nearly allied to *C. umbraculifera*, the embryo is situated at the apex, as in *Hyphæne*.

The journal also notices a species of *Raphia*, which is probably *Raphia vinifera* of M. de Beauvois,² the *Sagus Palma-pinus* of Gærtner.

The collection contains fronds similar to those of *Calamus secundiflorus* of M. de Beauvois,³ which was also found at Sierra Leone by Professor Afzelius; and a male spadix very nearly resembling that of *Elate sylvestris* of India.

The Cocoa Nut was not observed in any part of the course of the river.

Only five species of Palms appear therefore to have been seen on the banks of the Congo. On the whole continent of Africa thirteen species, including those from Congo, have been found; which belong to genera either confined to this continent and its islands, or existing also in India, but none of which have yet been observed in America, unless perhaps *Elæis*, if *Alfonsia oleifera* of Humboldt should prove to be a distinct species of that genus.

CYPERACEÆ. In the collection there are thirty-two species belonging to this order, which forms therefore about one eighteenth of the Phænogamous plants. This is very different from what has been considered its equinoctial proportion, but is intermediate to that of the northern part of New Holland, where, from my own materials, it seems to be as 1 : 14; and of India, in which according to Dr. Roxburgh's Flora it is about 1 : 25.

¹ *Roxb. Coromand. 3, tabb. 255 et 256.*

² *Flore d'Oware 1, p. 75, tabb. 44, 45, et 46.*

³ *Op citat. 1, p. 15, tabb. 9, et 10.*

In other intratropical countries the proportion may be still smaller ; but I can neither adopt the general equinoctial ¹⁶⁵ ratio given by Baron Humboldt, namely, that of 1 : 60, nor suppose with him that the minimum of the order is within the tropics. For Cyperaceæ, like Rubiaceæ, and indeed several other families, is composed of tribes or extensive genera, having very different relations to climate. The mass of its equinoctial portion being formed of *Cyperus* and *Fimbristylis*, genera very sparingly found beyond the torrid zone ; while that of the frigid and part of the temperate zones consists of the still more extensive genus *Carex*, which hardly exists within the tropics, unless at great heights. Hence a few degrees beyond the northern tropic, on the old continent at least, the proportion of Cyperaceæ is evidently diminished, as in Egypt, according to M. Delile's valuable catalogue ;¹ and the minimum will, I believe, be found in the Flora Atlantica of M. Desfontaines and in Dr. Russel's catalogue of the plants of Aleppo.² It is not certain, however, that the smallest American proportion of the order exists in the same latitude. And it appears that in the corresponding parallel of the southern hemisphere, at the Cape of Good Hope and Port Jackson, the proportion is considerably increased by the addition of genera either entirely different from, or there more extensive than, those of other countries.

Among the Cyperaceæ of the Congo herbarium there are fifteen species of *Cyperus*, of which *C. Papirus* appears to be one. The abundance of this remarkable species, especially near the mouth of the river, is repeatedly noticed in Professor Smith's journal, but from the single specimen with fructification in the collection, its identity with the plant of Egypt and Sicily, though very probable, cannot be absolutely determined. I perceive a very slight difference in the sheaths of the radii of the common umbel, which in the plant from Congo are less angular and less exactly truncated, than in that of Egypt ; in other respects the two plants seem to agree. I have not seen *C. laxiflorus*, a

¹ *Flor. Egypt. Illustr. in Descrip. de l'Egypte, Hist. Nat. 2, p. 49.*

² *Nat. Hist. of Aleppo, 2nd ed. vol. 2, p. 242.*

species discovered in Madagascar by M. du Petit Thouars, and said to resemble *C. Papyrus* except in the vaginæ of the partial umbels.¹

Among the species of Cyperaceæ in the collection, having the most extensive range, are *Cyperus articulatus*, which is common to America, India, and Egypt; *Fuirena umbellata* and *Eleocharis capitata*,² both of which have been found in America, India, and New Holland; and *Cyperus ligularis* indigenous to other parts of Africa and to America.

Hypælyptum argenteum, a species established by Vahl from specimens of India and Senegal, and since observed in equinoctial America by Baron Humboldt, is also in the collection.

The name *Hypælyptum*, under which I have formerly described the genus that includes *H. argenteum*,³ was adopted from Vahl, without inquiry into its origin. It is probably, however, a corruption of *Hypælytrum*,⁴ by which M. Richard, as he himself assures me, chiefly intended another genus, with apparently similar characters, though a very different habit, and one of whose species is described by Vahl in *Hypælyptum*; his character being so constructed as to include both genera. M. Kunth has lately published *H. argenteum* under the name of *Hypælytrum*;⁵ but in adopting the generic character given in the ‘Prodromus Floræ Novæ Hollandiæ,’ he has, in fact, excluded the plants that M. Richard more particularly meant to refer to that genus. It is therefore necessary, in order to avoid further confusion, to give a new name to *Hypælyptum* as I have proposed to limit it, which may be *Lipocarpha*, derived from the whole of its squamæ being deciduous.

In describing *Lipocarpha* (under the name of *Hypælyptum*) in the work referred to, I have endeavoured to establish the analogy of its structure to that of *Kyllinga*; the inner or upper squamæ being in both genera opposite to the inferior squama, or anterior and posterior, with relation to the axis of the spikelet: while the squamæ of

¹ *Encyc. Method. Botan.* vol. 7, p. 270.

² *Prodr. Flor. Nov. Holl.* 1, p. 225. *Scirpus capitatus* Willd. sp. pl. 1, p. 294, exclus. syn. Gronovii. ³ *Prodr. Flor. Nov. Holl.* 1, p. 219.

⁴ *Persoon Syn. Plant* 1, p. 70.

⁵ *Nov. Gen. et Sp. Plant* 1, p. 218.

Richard's Hypaelytrum being lateral, or right and left with respect to the axis of the spikelet,¹ were compared to those of the female flowers of *Diplacrum*, to the utriculus or nectarium of *Carex*, and to the lateral bractæ of *Lepyrodia*, a genus belonging to the nearly related order Restiaceæ.² But as in *Hypaelytrum*, according to M. Richard's description, and I believe also in his *Diplasia*,³ there are sometimes more than two inner squamæ, which are then imbricate, they may in both these genera be considered as a spikelet reduced to a single flower, as in several other genera of Cyperaceæ, and in *Lipocarpha* itself, from which, ¹⁴⁶⁰ however, they are still sufficiently different in their relation to the including squamæ and to the axis of the spike.

This view of the structure of Hypaelytrum, of which there is one species in the Congo herbarium, appears to me in some degree confirmed by a comparison with that of *Chondrachne* and *Chorizandra*;⁴ for in both of these genera the lower squamæ of the ultimate spikelet are not barren, but monandrous, the central or terminating flower only being hermaphrodite.

GRAMINEÆ. Of this extensive family there are forty-five species from the Congo, or one twelfth of the Phænogamous plants of the collection. This is very nearly the equinoctial proportion of the order as given by Baron Humboldt, namely, one to fifteen, with which that of India seems to agree. On the north coast of New Holland, the proportion is still greater than that of Congo.

The two principal tribes which form the far greater part of Gramineæ, namely, *Poaceæ* and *Paniceæ* have, as I have formerly stated,⁵ very different relations to climate, the maximum both in the absolute and relative number of species of Paniceæ being evidently within the tropics, that of Poaceæ beyond them.

I have hitherto found this superiority of Paniceæ to Poaceæ, at or near the level of the sea within the tropics,

¹ *Prodr. Flor. Nov. Holl.* 1, p. 219. ² *Flinders's Voy.* 2, p. 579. (*Antè*, p. 53.)

³ *Persoon Syn. Pl.* 1, p. 70. ⁴ *Prodr. Flor. Nov. Holl.* 1, p. 220.

⁵ *Prodr. Flor. Nov. Holl.* 1, p. 169. *Obs. II.* *Flinders's Voy.* 2, p. 583. (*Antè*, p. 58.)

so constant, that I am inclined to consult the relative numbers of these two tribes, in determining whether the greater part of any intratropical Flora belongs to level tracts, or to regions of such elevation as would materially affect the proportions of the principal natural families: and in applying this test to Baron Humboldt's collection, it is found to partake somewhat of an extratropical character, Poaceæ being rather more numerous than Paniceæ. While in conformity to the usual equinoctial proportions, considerably more than half the grasses in the Congo herbarium consist of Paniceæ.

Among the Paniceæ of the collection, there are two unpublished genera. The *first* is intermediate, in character, to *Andropogon* and *Saccharum*, but with a habit very different from both. The *second*, which is common to ^{461]} other parts of the coast and to India, appears to connect in some respects *Saccharum* with *Panicum*.

The remarks I have to make on the *Acotyledonous Plants* from Congo, relate entirely to

FILICES, of which there are twenty-two species in the collection. The far greater part of these are new, but all of them are referable to well established genera, particularly to *Nephrodium*, *Asplenium*, *Pteris*, and *Polypodium*. There are also among them two new species of *Adiantum*, a genus of which no species had been before observed on this line of coast. *Trichomanes* and *Hymenophyllum* are wanting in the collection, and these genera, which seem to require constant shade and humidity, are very rare in equinoctial Africa. Of *Osmundaceæ*, the herbarium contains only one plant, which is a new species of *Lycopodium*, and the first of that genus that has been noticed from the continent of Africa.

Among the few species common to other countries, the most remarkable is *Gleichenia Hermanni*,¹ which I have compared and found to agree with specimens from the con-

¹ *Prod. Flor. Nov. Holl.* 1, p. 161. *Mertensia dichotoma* Willd. *Sp. Pl.* 5, p. 71.

tinent of India, from Ceylon, New Holland, and even from the Island of St. Vincent.

Acrostichum stemaria of M. de Beauvois,¹ which hardly differs from *A. alcicorne* of New Holland, and of several of the islands of the Malayan Archipelago, was also observed; and *Acrostichum aureum*, which agrees with specimens from equinoctial America, was found growing in plenty among the mangroves near the mouth of the river.

I have formerly observed that the number of Filices, unlike that of the other Cryptogamous orders, (*Lycopodineæ* excepted,) is greatest in the lower latitudes; and, as I then supposed, near or somewhat beyond the tropics. The latter part of this statement, however, is not altogether correct; the maximum of the order, both in absolute and relative number of species, being more probably within the tropics, though at considerable heights.

The degree of latitude alone being given, no judgment can be formed respecting the proportion of Filices: for besides a temperature somewhat inferior, perhaps, to ^[462] that of equinoctial countries of moderate elevation, a humid atmosphere and protection from the direct rays of the sun, seem to be requisite for their most abundant production.

When all these conditions co-exist, their equinoctial proportion to Phænogamous plants is probably about one to twenty, even on continents where the tracts most favourable to their production form only a small part, their number being increased according as such tracts constitute a more considerable portion of the surface.

Hence their maximum appears to exist in the high, and especially the well wooded, intratropical islands. Thus in Jamaica, where nearly two hundred species of Ferns have been found, their proportion to Phænogamous plants is probably about one to ten. In the Isles of France and Bourbon, from the facts stated by M. du Petit Thouars,² they appear to be about one to eight.

In Otaheite, according to Sir Joseph Banks's observations,

¹ *Flore d'Oware* 1, p. 2, t. 2.

² *Mélanges de Bot. Observ. add. à M. de Lamarck*, p. 6, et 38.

they are as one to four. And in St. Helena, from Dr. Roxburgh's Catalogue,¹ they exceed one to two.

This high proportion extends to the islands considerably beyond the southern tropic. Thus in the collection formed by Sir Joseph Banks in New Zealand, they are about one to six: in Norfolk Island, from my friend Mr. Ferdinand Bauer's observations, they exceed one to three: and in Tristan Da Cunha, both from the Catalogue published by M. du Petit Thouars,² and the still more complete Flora of that Island, for which I am indebted to Captain Dugald Carmichael, they are to the Phænogamous plants as two to three.

The equinoctial proportion of Ferns in level and open tracts, is extremely different from those already given; and it is not improbable that as the maximum of this order is equinoctial, so its minimum will also be found either within or a few degrees beyond the tropics. Thus in several of the low Islands in the Gulf of Carpentaria, having a Flora of upwards of two hundred Phænogamous plants, not more than three species of Ferns were found, and those very sparingly. In Egypt it appears, both by Forskål's catalogue and the more extensive Flora of M. Delile, that only one Fern³ has been observed.

^{463]} In Russel's catalogue of the plants of Aleppo two only are noticed: and even in M. Desfontaines' Flora Atlantica not more than eighteen species occur, or with relation to the Phænogamous plants, about one to one hundred.

The Ferns in the herbarium from Congo, are to the Phænogamous plants as about one to twenty-six, which agrees nearly with their proportion in Forskål's catalogue of the plants of Arabia, with that of the north coast of New

¹ Beatson's Tracts relative to St. Helena, p. 295. ² Mélanges de Botanique.

³ Named *Adiantum capillus veneris* by both these authors; but possibly a nearly related species that has often been confounded with it. Of the species I allude to, which may be called *Adiantum Africanum*, I have collected specimens in Madeira, and have seen others from Teneriffe, St. Jago, Mauritius or Isle de Bourbon, and Abyssinia. *Adiantum Africanum* has also been confounded with *A. tenerum* of Jamaica, and other West India islands, and the latter with *A. capillus veneris*, which has in consequence been supposed common to both hemispheres, to the old and new continent, and to the torrid and temperate zones.

Holland, according to my own observations, and which is probably not very different from their proportion in India.

In concluding here the subject of the proportional numbers of the Natural Orders of plants contained in the herbarium from Congo, I may observe, that the ratios I have stated, do not always agree with those given in Baron Humboldt's learned dissertation, so often referred to. I have ventured, however, to differ from that eminent naturalist with less hesitation, as he has expressed himself dissatisfied with the materials from which his equinoctial proportions are deduced. Whatever may be the comparative value of the facts on which my own conclusions depend, I certainly do not look upon them as completely satisfactory in any case. And it appears to me evident, that with respect to several of the more extensive natural orders, other circumstances besides merely the degrees of latitude and even the mean temperature must be taken into account in determining their relative numbers. To arrive at satisfactory conclusions in such cases, it is necessary to begin by ascertaining the geographical distribution of genera, a subject, the careful investigation of which may likewise often lead to important improvements in the establishment or sub-divisions of these groups themselves, and assist in deciding from what regions certain species, now generally diffused, may have originally proceeded.

To the foregoing observations on the principal Natural Orders of Plants from the banks of the Congo, a few remarks may be added on such families as are general in equinoctial countries, but which are not contained in the collection.

These are Cycadeæ, Piperaceæ, Begoniaceæ, Laurinæ ¹⁶¹ (Cassytha excepted,) Passifloreæ, Myrsinæ, Magnoliaceæ, Guttiferae, Hesperideæ, Cedreleæ, and Meliaceæ.

Cycadeæ, although not found in equinoctial Africa, exist at the Cape of Good Hope and in Madagascar.

Piperaceæ, as has been already remarked by Baron Humboldt,¹ are very rare in equinoctial Africa; and indeed

¹ *Nov. Gen. et Sp. Pl. Orb. Nov.* 1, p. 60.

only two species have hitherto been published as belonging to the west coast : the first, supposed to be *Piper Cubeba*, and certainly very nearly related to it, is noticed by Clusius;¹ the second is imperfectly described by Adanson in his account of Senegal. A third species of *Piper*, however, occurs in Sir Joseph Banks's herbarium, from Sierra Leone : and we know that at least one species of this genus and several of *Peperomia*, exist at the Cape of Good Hope.

The extensive genus *Begonia*, which it is perhaps expedient to divide, may be considered as forming a natural order, whose place, however, among the Dicotyledonous families, is not satisfactorily determined. Of *Begoniaceæ*,² no species has yet been observed on the continent of Africa, though several have been found in Madagascar and the Isles of France and Bourbon, and one in the Island of Johanna.

No genus of *Laurinæ*, is known to exist in any part of the continent of Africa, except the paradoxical *Cassytha*, of which the only species in the Congo collection can hardly be distinguished from that of the West Indies, or from *C. pubescens* of New Holland. The absence of *Laurinæ* on the continent of Africa is more remarkable, as several species of *Laurus* have been found both in Teneriffe and Madeira, and certain other genera belonging to this family exist in Madagascar and in the Isles of France and Bourbon.

Passifloraæ. A few remarkable plants of this order have been observed on the different parts of the west coast of Africa, especially Modecca of the Hortus Malabaricus and Smeathmania, an unpublished genus already mentioned in treating of *Homalinæ*.

Myrsinæ. No species of any division of this order, has been met with in equinoctial Africa, though several of the [465] first section, or *Myrsinæ*, properly so called, exist both at the Cape of Good Hope and in the Canary Islands.³

¹ *Piper ex Guinea*, *Clus. exot.* p. 184, who considers it as not different from the *Piper caudatum*, figured on the same page, and which is no doubt *Piper Cubeba* of the Malayan Archipelago. ² *Bonpland Malmais*, 151.

³ To the first section belong *Myrsine*, *Ardisia*, and *Eladzia*. The second, including *Embelia*, and perhaps also *Othera* of Thunberg, differs from the first merely in its corolla being polypetalous. *Aegiceras* may be considered as

Magnoliaceæ and *Cedreleæ*, which are common to America and India, have not been found on the continent of Africa, nor on any of the adjoining Islands.

Guttiferæ and *Hesperideæ* exist, though sparingly, on other parts of the coast.

A few plants really belonging to *Meliaceæ* have been found on other parts of western equinoctial Africa, and a species of *Leea* (or *Aquilicia*, for these are only different names for the same genus) which was formerly referred to this order, occurs in the herbarium from Congo.

M. de Jussieu, who has lately had occasion to treat of the affinity of *Aquilicia*,¹ does not venture to fix its place in the system. Its resemblance to *Viniferae* in the singular structure of seeds, in the valvular aestivation of the corolla, in the division of its leaves, the presence of stipules, and even in inflorescence, appears to me to determine, if not its absolute union, at least its near affinity to that order. Of *Viniferæ*, *Vitis* is at present the only certain genus; for *Cissus* and *Ampelopsis* having, as Richard has already observed, exactly the same structure of ovary, namely, two cells with two erect collateral ovula in each, should surely be referred to it; nor is there any part of the character or description of *Botria* of Loureiro, which prevents its being also included in the same genus.

Lasianthera of M. de Beauvois,² referred by its author to Apocineæ, but which M. de Jussieu has lately suggested may belong to *Viniferæ*,³ is too imperfectly known to admit of its place being determined.

forming a third section, from the remarkable evolution of its embryo and consequent want of albumen. In the aestivation of calyx and corolla it agrees with *Jacquinia*, which together with *Theophrasta*, (or *Clavija* of the Flora Peruviana), forms the fourth section; characterised by the squamæ, more or less distinct, of the faux of the corolla, and by generally ripening more than one seed. The fifth, includes only *Bæobotrys* of Förster (the *Mæsa* of Forskål) which, having ovary inferum and five barren filaments alternating with the segments of the corolla, bears the same relation to the other genera of this order, that *Samolus* does to Primulaceæ. On the near affinity, and slight differences in fructification, between this family and Myrsinæ, I have formerly made a few remarks in the Prodr. Flor. Nov. Holl. 1, p. 533.

¹ *Mém. du Mus. d'Hist. Nat.* 3, p. 437 et 441. ² *Flore d'Océan*, 1, p. 85.

³ *Loc. cit.*

III. In the third part of my subject I am to compare the vegetation of the line of the river Congo with that of other equinoctial countries, and with the various parts of the continent of Africa and its adjoining Islands.

The first comparison to be made is obviously with the other parts of the *West coast of equinoctial Africa*.

The most important materials from this coast to which I have had access are contained in the herbarium of Sir Joseph Banks, and consist chiefly of the collections of Smetham from Sierra Leone, of Brass from Cape Coast (Cabo Corso), and the greater part of the much more numerous discoveries of Professor Afzelius already referred to. Besides these, there are a few less extensive collections in the same herbarium, especially one from the banks of the Gambia, made by Mr. Park in returning from his first journey into the interior; and a few remarkable species brought from Suconda and other points in the vicinity of Cape Coast, by Mr. Hove. The published plants from the west coast of Africa are to be found in the splendid and interesting *Flore d'Oware et Benin* of the Baron de Beauvois; in the earlier volumes of the Botanical Dictionary of the Encyclopédie Méthodique by M. Lamarck, chiefly from Sierra Leone and Senegal; in the different volumes of Willdenow's Species Plantarum from Isert; in Vahl's Enumeratio Plantarum from Thonning; a few from Senegal in the Genera Plantarum of M. de Jussieu; and from Sierra Leone in a memoir on certain genera of Rubiaceæ by M. de Candolle, in the Annales du Museum d'Histoire Naturelle. Many remarkable plants are also mentioned in Adanson's Account of Senegal, and in Isert's Travels in Guinea.

On comparing Professor Smith's herbarium with these materials, it appears that from the river Senegal in about 16° N. lat. to the Congo, which is in upwards of 6° S. lat., there is a remarkable uniformity in the vegetation, not only as to the principal natural orders and genera, but even to a considerable extent in the species of which it consists. Upwards of one third part of the plants in the collection from Congo had been previously observed on other parts

of the coast, though of these the greater part are yet unpublished.

Many of the Trees, the Palms, and several other remarkable plants, which characterise the landscape, as *Adansonia*, *Bombax pentandrum*, *Anthocleista*, *Musanga* of the natives (the genus related to *Cecropia*,) *Elæis Guineensis*, *Raphia vinifera* and *Pandanus Candolabrum*, appear to be very general along the whole extent of coast.

Sterculia acuminata,¹ the seed of which is the *Cola*, mentioned in the earliest accounts of Congo, exists, and is equally valued, in Guinea and Sierra Leone, and, what is remarkable, has the same name in every part of the west coast.

The *Ordeal Tree* noticed in Professor Smith's journal under the name of Cassa, and in Captain Tuckey's narrative erroneously called a species of *Cassia*, if not absolutely the same plant as the *Red Water Tree* of Sierra Leone,² and as it is said also of the Gold Coast, belongs at least to the same genus.

A species of the *Cream Fruit*, mentioned by Professor Afzelius,³ remarkable in affording a wholesome and pleasant saccharine fluid, used by the natives of Sierra Leone even to quench their thirst, though the plant belongs to Apocynæ, a family so generally deleterious, was also met with.

The *Sarcocephalus* of the same author,⁴ which is probably what he has noticed under the name of the country-fig of Sierra Leone,⁵ was found, and seems to be not uncommon, on the banks of the Congo.

Anona Senegalensis, whose fruit, though smaller than that of the cultivated species of the genus, has, according to Mr. Lockhart, a flavour superior to any of them, was everywhere observed, especially above Embomma, and appears to be a very general plant along the whole extent of coast.

And *Chrysobalanus Icaco*, or a species very nearly related to it, which is equally common from Senegal to

¹ *De Beauvois. Flore d'Oware*, 1, p. 41, t. 24.

² *Winterbottom's Sierra Leone*, 1, p. 129.

³ *Sierra Leone Report for 1794*, p. 173, n. 47.

⁴ *In Herb. Banks.*

⁵ *Op. cit. p. 171, n. 32.*

Congo, was found abundantly near the mouth of the river.

The remarks I have to make on *Esculent Plants*, my knowledge of which is chiefly derived from the journals of Captain Tuckey and Professor Smith, and the communications of Mr. Lockhart, may be here introduced; the cultivated as well as the indigenous species being very similar along the whole of the west coast.

On the banks of the Congo, as far as the expedition proceeded, the principal articles of vegetable food were found to be Indian Corn or Maize (*Zea Mays*); Cassava, both sweet and bitter, (*Iatropha Manihot L.*); two kinds of Pulse, extensively cultivated, one of which is *Cytisus Cajan* of Linnaeus, the other not determined, but believed to be a species of *Phaseolus*; and Ground Nuts (*Arachis hypogaea L.*)

The most valuable fruits seen were Plantains (*Musa sapientum*); the Papaw (*Carica papaya*); Pumpkins (*Cucurbita Pepo*); Limes and Oranges (*Citrus medica et aurantium*); Pine Apples (*Bromelia Ananas*); the common Tamarind (*Tamarindus indica*); and *Safu*, a fruit the size of a small plum, which was not seen ripe.

One of the most important plants not only of Congo, but of the whole extent of coast, is *Elæis Guineensis* or the *Oil Palm*, from which also the best kind of Palm Wine is procured. Wine is likewise obtained from two other species of Palms, which are probably *Raphia vinifera*, and the supposed *Corypha*, considered as an *Hyphæne* by Professor Smith.

Among the other Alimentary Plants which are either of less importance or imperfectly known, may be mentioned the "Shrubby *Holcus*," noticed by Captain Tuckey (p. 138); the common *Yam*, which Mr. Lockhart informs me he saw only near Cooloo; and another species of *Dioscorea* found wild only, and very inferior to the Yam, requiring, according to the narrative, "four days boiling to free it from its pernicious qualities." On the same authority, "Sugar Canes of two kinds" were seen at Embomma, and Cabbages

at Banza Noki: a kind of Capsicum or Bird Pepper, and Tobacco, were both observed to be generally cultivated: and I find in the herbarium, a specimen of the *Malaguetta Pepper*, or one of the species of *Amomum*, confounded under the name of *A. Granum-Paradisi*.

Mr. Lockhart believes there was also a second kind of Ground Nut or Pea, which may be that mentioned by Merolla, under the name of *Incumba*,¹ and the second sort perhaps noticed in Proyart's account of Loango,² which is probably *Glycine subterranea* of Linnæus, the Voandzeia¹⁶⁹ of M. du Petit Thouars,³ or Voandzou of Madagascar, where it is generally cultivated.⁴

Of the indigenous fruits, *Anona Senegalensis*, *Sarcoccephalus*, a species of Cream fruit, and *Chrysobalanus Icaco*, have been already mentioned, as trees common to the whole line of coast.

A species of *Ximenia* was also found by Professor Smith, who was inclined to consider it as not different from *X. Americana*: its fruit, which, according to his account, is yellow, the size of a plum, and of an acid but not disagreeable taste, is in the higher parts of the river called Gangi, it may therefore probably be the *Ogheghe* of Lopez,⁵ by whom it is compared to a yellow plum, and the tree producing it said to be very generally planted.

An *Antidesma*, probably like that mentioned by Afzelius, as having a fruit in size and taste resembling the currant, is also in the herbarium.

It is particularly deserving of attention, that the greater part of the plants now enumerated, as cultivated on the banks of the Congo, and among them nearly the whole of the most important species, have probably been introduced from other parts of the world, and do not originally belong even to the continent of Africa. Thus it may be stated with confidence that the Maize, the Manioc or Cassava, and the Pine Apple, have been brought from America, and probably the Papaw, the Capsicum, and Tobacco; while the

¹ *Piccardo Relaz. del Viag. nel Reg. di Congo*, p. 119.

² P. 18.
³ *Nov. Gen. Madagasc. n. 77.*

⁴ *Flacourt Madagasc. pp. 114 et 118.*

⁵ *Pigafetta, Hartwell's Translat.* p. 115.

Banana or Plantain, the Lime, the Orange, the Tamarind, and the Sugar Cane, may be considered as of Asiatic origin.

In a former part of this essay, I have suggested that a careful investigation of the geographical distribution of genera might in some cases lead to the determination of the native country of plants at present generally dispersed. The value of the assistance to be derived from the source referred to, would amount to this ; that, in doubtful cases, where other arguments were equal, it would appear more probable that the plant in question should belong to that country in which all the other species of the same genus were found decidedly indigenous, than to that where it was the only species of the genus known to exist. It seems to me that this reasoning may be applied with advantage towards determining the original country of several of the plants here enumerated, especially of the Banana, the Papaw, the Capsicum, and Tobacco.

The *Banana* is generally considered to be of Indian origin : Baron Humboldt, however, has lately suggested¹ that several species of *Musa* may possibly be confounded under the names of Plantain and Banana ; and that part of these species may be supposed to be indigenous to America. How far the general tradition said to obtain both in Mexico, and Terra Firma, as well as the assertion of Garcilasso de la Vega respecting Peru, may establish the fact of the *Musa* having been cultivated in the new continent before the arrival of the Spaniards,² I do not mean at present to inquire. But in opposition to the conjecture referred to, it may be advanced that there is no circumstance in the structure of any of the states of the Banana or Plantain cultivated in India, or the islands of equinoctial Asia, to prevent their being all considered as merely varieties of one and the same species, namely, *Musa sapientum* ; that their

¹ *Nouv. Espag.* vol. 2, p. 360.

² *Op. cit.*, p. 361. It may be observed, however, that this is not the opinion in every part of the continent of South America, for with respect to Brazil, Maregraf and Piso assert that both the Banana and Plantain are considered as introduced plants, and the latter apparently from Congo. (*Marcg.* p. 137, et *Piso Hist. Nat. Bras.* p. 154.)

reduction to a single species is even confirmed by the multitude of varieties that exist;¹ by nearly the whole of these varieties being destitute of seeds; and by the existence of a plant indigenous to the continent of India, producing perfect seeds; from which, therefore, all of them may be supposed to have sprung.

To these objections to the hypothesis of the plurality of species of the Banana, may be added the argument referred to as contributing to establish its Asiatic origin; for we are already acquainted with at least five distinct species of *Musa* in equinoctial Asia, while no other species has been found in America; nor does it appear that the varieties of Banana, cultivated in that continent, may not equally be reduced to *Musa sapientum* as those of India: and lastly, it is not even asserted that the types of any of those supposed species of American Banana, growing without cultivation, and producing perfect seeds, have any where been found.²

That the Bananas now cultivated in equinoctial Africa,³ come originally from India, appears to me equally probable, though it may be allowed that the *Ensete* of Bruce³ is perhaps a distinct species of this genus, and indigenous only to Africa.

¹ *Musa sapientum*, Rox. *Corom. tab. 275.*

² M. Desvaux, in a dissertation on the genus *Musa* (*in Journ. de Botanique appl.* vol. 4, p. 1), has come to the same conclusion respecting the original country of the cultivated Banana, and also that its numerous varieties are reducible to one species. In this dissertation he takes a view of the floral envelope of *Musa* peculiar to himself. The perianthium in this genus is generally described as consisting of two unequal divisions or lips. Of these, one is divided at top into five, or more rarely into three segments, and envelopes the other, which is entire, of a different form and more petal-like texture. The enveloping division M. Desvaux regards as the calyx, the inner as the corolla. It seems very evident to me, however, that the deviation in *Musa* from the regular form of a Monocotyledonous flower, consists in the confluence of the three divisions of the outer series of the perianthium, and in the cohesion, more or less intimate, with these of the two lateral divisions of the inner series; the third division of this series, analogous to the labellum in the Orchidæ, being the inner lip of the flower. This view seems to be established by the several modifications observable in the different species of *Musa* itself, especially in *M. superba* of Roxburgh, (*Plants of Coromand. 3, tab. 223*), and in the flower of *Musa* figured by Plumier, (*Nov. Gen. t. 34*), but still more by the irregularity confined to the inner series in *Strelitzia*, and by the near approach to regularity, even in this series, in *Ravenala* (or *Urania*), both of which belong to the same natural order.

³ *Travels*, vol. 5, p. 36.

The *Papaw* (*Carica papaya*), from analogous reasoning, may be regarded as of American origin ; there being several other decidedly distinct species natives of that continent, while no species except the cultivated Papaw, nor any plant nearly related to this singular genus, is known to exist either in Asia or Africa. But in the present case, the assistance derived from the argument adduced, may perhaps be considered as unnecessary ; for the circumstance of there being no Sanscrit name for so remarkable a plant as the Papaw,¹ is nearly decisive of its not being indigenous to India. And in the Malay Islands, the opinion of the inhabitants, according to Rumphius,² is that it was there introduced by the Portuguese.

The same argument may be extended to *Capsicum*, of which all the known species probably belong to the new continent ; for the only important exception stated to this genus being wholly of American origin, namely, *C. frutescens*,^{472]} seems to be set aside merely by the appellations of *Tchilli* and *Lada Tchilli*, as given to it in the Malay Islands ; *Chilli*, either simply, or in composition, being the Mexican name for all the species and varieties of this genus.³

All the species of *Nicotiana* appear to be American, except *N. Australasiæ* (the *N. undulata* of Ventenat and Prod. Flor. Nov. Holl. but not of Flora Peruviana,) which is certainly a native of New Holland. The exception here, however, does not materially invalidate the reasoning, *N. Australasiæ* differing so much from the other species as to form a separate section of the genus.

The same argument might perhaps be applied to other plants of doubtful origin, as to *Canna indica*, which it would derive from America.

It is certainly not meant, however, to employ this reasoning in every case, and in opposition to all other evidence ; and instances may be found, even among the alimentary plants, where it is very far from being satisfactory. Thus the Cocoa Nut, though it will probably be considered as

¹ Fleming in *Asiat. Resear.* ii, p. 161.

² *Herb. Amboin.* i, p. 147.

³ Hernandez, *Rer. Medic. Nov. Hispan. Thesaur.* p. 134, et Nieremb. *Hist. Nat.* p. 363.

indigenous to the shores and islands of equinoctial Asia, is yet the only species of its genus that does not belong exclusively to America.

Cytisus Cajan, may be supposed to have been introduced from India. This plant, which is very generally cultivated in the vicinity of the Congo, I conclude is the *Voando*, mentioned by Captain Tuckey as being ripe in October; and as Mr. Lockhart understood from the natives, that *Cytisus Cajan* continues to bear for three years, it is probably Merolla's *Ovvando*, of which he gives a similar account.¹

Whether *Arachis hypogaea* be indigenous or introduced, cannot now perhaps be satisfactorily determined. This remarkable plant, whose singular structure and economy were first correctly described by M. Poiteau,² and which was every where seen in abundance, as far as the river was examined, appears to form an important article of cultivation along the whole of the west coast of Africa, and probably also on the east coast, on several parts of which it was found by Loureiro.³

According to the same author, it is also universally cultivated in China and Cochinchina.

From China it has probably been introduced into the continent of India, Ceylon, and the Malayan Archipelago, where, though now generally cultivated, there is reason to believe, particularly from the names given to it, that it is not indigenous. I think it not very improbable that it may have been carried from Africa to various parts of equinoctial America, though it is noticed in some of the early accounts of that continent, especially of Peru and Brazil.

According to Professor Sprengel,⁴ it is mentioned by Theophrastus as cultivated in Egypt: but it is by no means evident that *Arachis* is the plant intended in the passage of Theophrastus referred to; and it is probable that had it been formerly cultivated in Egypt, it would still be found in that country; it is not, however, included either in

¹ Piccardo Relaz. p. 120. ² Mem. de l'Instit. Sc. Phys. Sav. Etrang. 1, p. 455.
³ Flor. Cochin. 430. ⁴ Hist. Rei Herb. 1, p. 98.

Forskål's Catalogue, or in the more extensive Flora Egyp-tiaca of M. Delile.

There is nothing very improbable in the supposition of *Arachis hypogaea* being indigenous to Asia, Africa, and even America ; but if it be considered as originally belonging to one of those continents only, it is more likely to have been brought from China through India to Africa, than to have been carried in the opposite direction.

Glycine subterranea, however, which is extensively cultivated in Africa, Madagascar, and several parts of equinoctial America, is probably of African origin ; it is stated, at least both by Marcgraf and Piso, to have been introduced into Brazil from Angola or Congo.¹

The *Holcus* noticed by Captain Tuckey, of which the specimens in the herbarium do not enable me to determine whether it be a distinct species, or a variety only of *H. sorghum* or *saccharatus*, may be considered as indigenous, or at least as belonging to Africa. According to Mr. Lockhart, it is very generally found wild, and it is only once mentioned as cultivated : it may, however, have been formerly cultivated, along with other species of Millet, to a much greater extent ; its place being now supplied by the Maize, which gives probably both a more productive and a more certain crop.

The *Dioscorea* or bitter Yam, which was observed only in a wild state, may be presumed to be a native species ; and if ever it has been cultivated, it may in like manner be supposed to have been superseded by the Manioc or Cassava.

The *Safu*,² which Mr. Lockhart understood from the natives was one of their most esteemed fruits, he observed to be very generally planted round the villages, especially from Embomma upwards, and to be carefully preserved from birds : its importance is perhaps increased from its ripening in October, a season when the general supply of vegetable food may be supposed to be scanty.

¹ Mandubi d'Angola. *Marcg. Hist. Nat. Brasil.* 43. Mandobi, *Piso, Hist. Nat. Brasil.* p. 256.

² Probably the *Zaffo* of some of the earlier accounts of Congo, vide *Malte-Brun Précis de la Geogr.* 5, p. 9.

There seems no reason to doubt that this tree, whose probable place in the system I have stated in my remarks on Amyrideæ, belongs originally to the west coast of Africa.

Elaeis Guineensis, of which the oil is distinctly described in the beginning of the sixteenth century by *Da Ca da Mosto*, in his account of Senegal,¹ is without doubt indigenous to the whole extent of this coast; as is *Raphia vinifera*, of which the remarkable fruit also very early attracted attention;² and the supposed species of *Corypha*.

Of Alimentary Plants, whether cultivated or indigenous, that are known or supposed to belong to the west coast of equinoctial Africa, but which were not seen on the banks of the Congo, a few of the more important may be mentioned.

Among these are the Cocoa Nut and Rice, the former, according to the natives, not being found in the country. The absence of these two valuable plants is the more remarkable, as the Cocoa Nut is said to exist in the neighbouring kingdom of Loango; and, according to Captain Tuckey, a certain portion of land was seen on the banks of the river well adapted to the production of Rice, which is mentioned as cultivated in some of the earlier accounts of Congo.

The Sweet Potatoe (*Convolvulus Batatas*), also noticed by the Portuguese Missionaries, was not met with.

The Butter and Tallow Tree of Afzelius, which forms a new genus belonging to Guttiferae; the Velvet-Tamarind of Sierra Leone (*Codarium acutifolium*;³) and the Monkey Pepper, or *Piper Aethiopicum* of the shops (*Unona Aethiopica* of Dunal), which is common on many parts of the coast, were not observed.

Two remarkable plants, the *Akee*⁴ and the *Jamaica* [175]

¹ *Ramusio* 1, p. 104. *Gryn. Nov. Orb.* 28.

² *Palma-Pinus*, *Lobel. advers.* p. 450.

³ *Afzel. Gen. Plant. Guineen. par. prim.* p. 23. *Codarium nitidum* *Vahl*, *enum.* 1, p. 302.

⁴ *Blighia sapida*, *König in Annals of Bot.* 2, p. 571. *Hort. Kew. ed. 2da.* vol. 2, p. 350.

At the moment that this sheet was about to have been sent to the press, Sir Joseph Banks received a small collection of specimens and figures of plants,

or *American Nutmeg*,¹ now cultivated in the West India colonies; and the former undoubtedly, the latter probably, introduced from Africa by the Negroes, were neither met with on the banks of the Congo, nor have they been yet traced to any part of the west coast.

The relation which the vegetation of the *Eastern shores of equinoctial Africa* has to that of the west coast, we have at present no means of determining; for the few plants, chiefly from the neighbourhood of Mozambique, included in Loureiro's *Flora Cochinchinensis*, and a very small number collected by Mr. Salt on the same part of the coast, do not afford materials for comparison.

The character of the collections of *Abyssinian Plants* made by Mr. Salt in his two journeys, forming part of Sir Joseph Banks's herbarium, and amounting to about 260 species, is somewhat extratropical, and has but little affinity to that of the vegetation of the west coast of Africa.

To the Flora of *Egypt*, that of Congo has still less relation, either in the number or proportions of its natural [476] families: the herbarium, however, includes several species which also belong to Egypt, as *Nymphaea Lotus*, *Cyperus Papirus* and *articulatus*, *Sphenoclea zeylanica*, *Glinus lotoides*, *Ethulia conyzoides*, and *Grangea maderaspatana*.

observed in the late Mission to Cummazee, the capital of Ashantee; and among them a drawing of the fruit and leaf of a plant, there called *Attueah* or *Attuah*, which is no doubt the *Akee*, whose native country is therefore now ascertained.

¹ *Monodora myristica*, *Dunal Annonac.* p. 80. *Decand. Syst. Nat. Reg. Veget.* 1, p. 477. *Anona myristica*, *Gert. Sem.* 2, p. 194, t. 125, p. 1. *Lunan Hort. Jamaic.* 2, p. 10. This remarkable plant is very properly separated from *Anona*, and considered as a distinct genus by M. Dunal in his monograph of *Anonaceæ*. The character given of this new genus, however, is not altogether satisfactory, M. de Candolle's description, from which it is derived, having probably been taken from specimens which he had it not in his power to examine completely. Both these authors have added to this genus *Annona microcarpa* of Jacquin (*Fragn. Bot.* p. 40, t. 44, f. 7), established by that author from the fruit of my *Cargillia Australis* (*Prodr. Flor. Nov. Holl.* 1, p. 527), which belongs to the very different family of *Ebenaceæ*.

Long, in his History of Jamaica (vol. 3, p. 735), has given the earliest account of *Monodora Myristica*, under the name of the *American Nutmeg*, and considers it to have been probably introduced from South America: according to other accounts, it comes from the Mosquito shore: but there is more reason to suppose that it has been brought by the Negroes from some part of the west coast of Africa.

Of the many remarkable genera and orders characterising the vegetation of *South Africa*, no traces are to be found in the herbarium from Congo. This fact is the more worthy of notice, because even in Abyssinia a few remains, if I may so speak, of these characteristic tribes, have been met with; as the *Protea Abyssinica*,¹ observed by Bruce, and *Pelargonium Abyssinicum* and *Geissorrhiza Abyssinica*² found by Mr. Salt.

Between the plants collected by Professor Smith in the island of *St. Jago* and those of the Congo herbarium, there is very little affinity; great part of the orders and genera being different, and not more than three species, of which *Cassia occidentalis* is one, being common to both. To judge from this collection of *St. Jago*, it would seem that the vegetation of the Cape Verd Islands is of a character intermediate between that of the adjoining continent and of the Canary Islands, of which the Flora has, of course, still less connection with that of Congo.

It might perhaps have been expected that the examination of the vicinity of the Congo would have thrown some light on the origin, if I may so express myself, of the Flora of *St. Helena*. This, however, has not proved to be the case; for neither has a single indigenous species, nor have any of the principal genera, characterising the vegetation of that Island, been found either on the banks of the Congo, or on any other part of this coast of Africa.

There appears to be some affinity between the vegetation of the banks of the Congo and that of *Madagascar* and the *Isles of France* and *Bourbon*. This affinity, however, consists more in a certain degree of resemblance in several natural families and extensive or remarkable genera, than in identity of species, of which there seems to be very few in common.

The Flora of Congo may be compared with those of equinoctial countries still more remote.

With that of *India*, it agrees not only in the proportions of many of its principal families, or in what may be termed

¹ Gagnedi Bruce's Travels 5, p. 52.

² Salt's Travels in Abyssinia, append. pp. lxiii. and lxv. (Antè, pp. 93 and 95.)

the equinoctial relation, but also, to a certain degree, in the [477] more extensive genera of which several of these families consist: and there are even about forty species common to these distant regions.

To the vegetation of *Equinoctial America* it has certainly much less affinity. Several genera, however, which have not yet been observed in India or New Holland, are common to this part of Africa and America:¹ and there are upwards of thirty species in the Congo herbarium, which are also natives of the opposite coasts of Brazil and Guiana.

As the identity of species, especially of the Dicotyledonous division, common to equinoctial America and other intratropical countries, has often been questioned, I have subjoined two lists of plants included in the Congo herbarium, of which the first consists of such species as are common to America and India: and the second, of such as are found in America only.

I have given also a third list, of species common to Congo and India, or its Islands, but which have not been observed in America.

And a fourth is added, consisting of doubtful plants, to which I have, in the mean time, applied the names of those species they most nearly resemble, and to which they may really belong, without, however, considering their identity as determined.

I. List of Plants common to Equinoctial Africa, America, and Asia.

Gleichenia Hermanni, <i>Prodr. Flor.</i>	<i>Nov. Holl.</i>	Fuirena umbellata, <i>L. fil.</i>
Mertensia dichotoma, <i>Willd.</i>		Pistia Stratiotes, <i>L.</i>
Agrostis Virginica, <i>L.</i>		Boerhaavia mutabilis, <i>Prodr. Flor.</i>
Cyperus articulatus, <i>L.</i>	<i>ead. sp.</i>	<i>Nov. Holl.</i>
— niloticus, <i>Vahl.</i>		Ipomoea pes-caprae, <i>Nob.</i>
Lipocarpha argentea, <i>Nob.</i>		Convolvoulus pes-caprae, <i>L.</i>
Hypælyptum argenteum, <i>Vahl.</i>	<i>ead. sp.</i>	<i>brasiliensis, L.</i>
Eleocharis capitata, <i>Prodr. Fl. N. Holl.</i>		Ipomoea pentaphylla, <i>Jacqu.</i>
		Scoparia dulcis, <i>L.</i>

¹ Namely, *Elæis*, *Jacqu.* *Rivina*, *L.* *Telanthera*, *Nob.* (*Alternantheræ pentandriæ*). *Alchornea*, *Sw.* *Blechum*, *Prodr. Flor. Nov. Holl.* (*Blechi sp. Juss.*) *Schwenckia*, *L.* *Hyptis*, *Jacqu.* *Vandellia*, *L.* *Annona*, *L.* *Banisteria*, *Nob.* (*Banisteriae sp. L.*) *Paullinia*, *Juss.* (*Paulliniæ sp. L.*) *Vismia*, *Ruiz. et Pav.* *Conocarpus*, *L.* *Legnotis*, *Sw.* (*Cassipourea*, *Aubl.*) *Chailletia*, *Decand.*

<i>Heliotropium indicum</i> , L.	<i>Sida periplocifolia</i> , L.
<i>Sphenoclea zeylanica</i> , Gaert.	<i>Cassia occidentalis</i> , L.
<i>Ageratum conyzoides</i> , L.	<i>Gilandina Bondue</i> , L.
<i>Waltheria indica</i> , L.	<i>Bonduella</i> , L. } ead. sp. — <i>americana</i> , L. } ead. sp. <i>Hibiscus tiliaceus</i> , L.
	<i>Abrus precatorius</i> , L.
	<i>Hedysarum triflorum</i> , L.

II. Plants common to Equinoctial Africa and America : but not found in India.

<i>Octoblepharum albidum</i> , Hedw.	<i>Sida juncea</i> , Banks et Soland. MSS.
<i>Acrostichum aureum</i> , L.	<i>Brasil.</i>
<i>Eragrostis ciliaris</i> . }	<i>Urena americana</i> , L. }
Poa ciliaris, L. }	— <i>reticulata</i> , Cavan. }
<i>Cyperus ligularis</i> , L.	<i>Malachra radiata</i> , L.
<i>Schwenckia americana</i> , L.	<i>Jussiaea creta</i> , L.
<i>Hyptis obtusifolia</i> , Nob.	<i>Crotalaria axillaris</i> , Hort. Kew. & Willd.
<i>Struchium (Americanum)</i> , Br. jam. 312.	<i>Pterocarpus lunatus</i> , L.

III. Plants common to equinoctial Africa and India : but not found in America.

<i>Roccella fuciformis</i> , Achar. Lichenog. 440.	<i>Grangea (maderaspatana)</i> , Adans.
<i>Perotis latifolia</i> , Soland. in Hort. Kew.	<i>Lavencia erecta</i> , Sio.
<i>Centotheca lappacea</i> , Beauv.	<i>Oxystelma esculentum</i> , Nob.
<i>Fleusine indica</i> , Gaert.	<i>Periploca esculenta</i> , Roxb.
<i>Flagellaria indica</i> , L.	<i>Nymphaea Lotus</i> , L. }
<i>Gloriosa superba</i> , L.	— <i>pubescens</i> , Willd. }
<i>Celosia argentea</i> , L.	<i>Hibiscus surattensis</i> , L.
— <i>margaritacea</i> , L. }	<i>Leea sambucina</i> , L.
— <i>albida</i> ? Willd.	<i>Hedysarum pictum</i> , L.
<i>Desmochæta lappacea</i> , Decand.	<i>Indigofera lateritia</i> , Willd.
	<i>Glinus lotoides</i> , L.

IV. List of Species which have not been satisfactorily ascertained.

<i>Acrostichum alcicorne</i> , Sw.	<i>Celtis orientalis</i> , L.
— <i>stemaria</i> , Beauv.	<i>Cardiospermum grandiflorum</i> , Sio.
<i>Imperata cylindrica</i> , Prodr. Flor. Nov. Holl.	<i>Paulinia pinnata</i> , L.
<i>Panicum crus-galli</i> , L.	<i>Hydrocotyle asiatica</i> , L. }
<i>Typha angustifolia</i> , L.	<i>Hedysarum adscendens</i> , Sio.
<i>Gisekia pharnaceoides</i> , L.	<i>Hedysarum vaginale</i> , L.
<i>Cassytha pubescens</i> , Prodr. Flor. Nov. Holl.	<i>Pterocarpus Ecastophyllum</i> , L.

On these lists it is necessary to make some observations.

1st. The number of species in the first three lists taken

together is equal at least to one-twelfth of the whole collection. The proportion, indeed, which these species bear to the entire mass of vegetation on the banks of the Congo is probably considerably smaller, for there is no reason to believe that any of them are very abundant except *Cyperus Papyrus* and *Bombax pentandrum*, and most of them appear to have been seen only on the lower part of the river.

2nd. The relative numbers of the species belonging to the primary divisions in the lists, are analogous to, and not very materially different from, those of the whole herbarium ; Dicotyledones being to Monocotyledones nearly as 3 to 1 ; and Acotyledones being to both these divisions united as hardly 1 to 16 : hence the Phænogamous plants of the lists alone form about one-thirteenth of the entire collection.

The proportions now stated are very different from those existing in the catalogue I have given of plants common to New Holland and Europe;¹ in which the Acotyledones form one-twentieth, and the Phænogamous plants only one-sixtieth part of the extra-tropical portion of the Flora ; while the Monocotyledones are to the Dicotyledones as 2 to 1.

The great proportion of Dicotyledonous plants in the lists now given, and especially in the first two, which are altogether composed of American species, is singularly at variance with an opinion very generally received, that no well established instance can be produced of a Dicotyledonous plant, common to the equinoctial regions of the old and new continent.

3rd. The far greater part of the species in the lists are strictly equinoctial ; a few, however, have also been observed in the temperate zones, namely, *Agrostis Virginica*, belonging, as its name implies, to Virginia, and found also on the shores of Van Diemen's Island, in a still higher latitude ; *Cyperus Papyrus* and *articulatus*, *Nymphaea Lotus*, and ^{480]} *Pistia Stratiotes*, which are natives of Egypt ; *Glinus lotoides* of Egypt and Barbary ; and *Flagellaria indica*,

¹ *Flinders' Voy.* 2, p. 592. (*Antè*, p. 68.)

existing on the east coast of New Holland, in as high a latitude as 32° S.

4th. It may perhaps be suggested with respect to these lists, that they contain, or even chiefly consist of, plants that during the constant intercourse which has now subsisted for upwards of three centuries between Africa, America, and India, may have, either from design or accidentally, been carried from one of these regions to another, and therefore are to be regarded as truly natives of that continent only from which they originally proceeded.

It appears to me, however, that there is no plant included in any of the lists which can well be supposed to have been *purposely* carried from one continent to another, unless perhaps *Chrysobalanus Icaco*, and *Cassia occidentalis*; both of which may possibly have been introduced into America by the Negroes, from the west coast of Africa; the former as an eatable fruit, the latter as an article of medicine. It seems at least more likely that they should have travelled in this than in the opposite direction. But I confess the mode of introduction now stated, does not appear to me very probable, even with respect to these two plants; both of them being very general in Africa, as well as in America; though *Crysobalanus Icaco* is considered of but little value as a fruit in either continent; and for *Cassia occidentalis*, which exists also in India, another mode of conveyance must likewise be sought.

Several species in the lists, however, may be supposed to have been *accidentally* carried, from adhering to, or being mixed with, articles of food or commerce; either from the nature of the surface of their pericarpial covering, as *Desmochæta lappacea*, *Lavenia erecta*, *Ageratum conyzoides*, *Grangea maderaspatana*, *Boerhaavia mutabilis*, and *Hyptis obtusifolia*; or from the minuteness of their seeds, as *Schwenckia americana*, *Scoparia dulcis*, *Jussiaea erecta*, and *Sphenoclea zeylanica*. That the plants here enumerated have actually been carried in the manner now stated is, however, entirely conjectural, and the supposition is by no means necessary; several of them, as *Lavenia erecta*, *Scoparia dulcis*, and *Boerhaavia mutabilis*, being also natives of

the intratropical part of New Holland ; their transportation to or from which cannot be supposed to have been affected in any of the ways suggested.

The probability, however, of these modes of transportation, with respect to the plants referred to, and others of similar structure, being even admitted, the greater part of the lists would still remain ; and to account for the dispersion^{481]} of these, recourse must be had to natural causes, or such as are unconnected with human agency. But the necessity of calling in the operation of these causes implies the adoption of that theory according to which each species of plants is originally produced in one spot only, from which it is gradually propagated. Whether this be the only, or the most probable opinion that can be held, it is not my intention to inquire : it may however be stated as not unfavorable to it, that, of the Dicotyledonous plants of the lists, a considerable number have the embryo of the seed highly developed, and at the same time well protected by the texture of its integuments.

This is the case in Malvaceæ, Convolvulaceæ, and particularly in Leguminosæ, which is also the most numerous family in the lists, and in several of whose species, as *Guilandina Bonduc*, and *Abrus precatorius*, the two conditions of development and protection of the embryo coexist in so remarkable a degree, that I have no doubt the seeds of these plants would retain their vitality for a great length of time either in the currents of the ocean,¹ or in the digestive organs of birds and other animals ; the only means apparently by which their transportation from one continent to another can be effected : and it is deserving of notice that these seem to be the two most general plants on the shores of all equinoctial countries.

The Dicotyledonous plants in the lists which belong to other families have the embryo of the seed apparently less

¹ Sir Joseph Banks informs me, that he received some years ago the drawing of a plant, which his correspondent assured him was raised from a seed found on the west coast of Ireland, and that the plant was indisputably *Guilandina Bonduc*. Linnaeus also seems to have been acquainted with other instances of germination having taken place in seeds thrown on shore on the coast of Norway. *Vide Colonice Plantarum*, p. 3, in *Amoen. Acad. vol. 8.*

advanced, but yet in a state of considerable development, indicated either by the entire want or scanty remains of albumen: the only exception to this being *Leea*, in which the embryo is many times exceeded in size by the albumen.

In the Monocotyledonous plants, on the other hand, consisting of Gramineæ, Cyperaceæ, Gloriosa, Flagellaria and Pistia, the embryo bears a very small proportion to the mass of the seed, which is formed of albumen, generally farinaceous. But it may here be observed that the existence of a copious albumen in Monocotyledones does not equally imply an inferior degree of vitality in the embryo, but [482] may be considered as the natural structure of that primary division; seeds without albumen occurring only in certain genera of the paradoxical Aroideæ, and in some other Monocotyledonous orders which are chiefly aquatic.

5th. Doubts may be entertained of the identity of particular species. On this subject I may observe, that for whatever errors may be detected in these lists, I must be considered as solely responsible; the insertion of every plant contained in them being founded on a comparison of specimens from the various regions of which their existence in the particular lists implies them to be natives. The only exception to this being *Lipocarpha argentea*, of which I have not seen American specimens; as a native of that continent therefore it rests on the very sufficient authority of Baron Humboldt and M. Kunth.

In my remarks on the natural orders, I have already suggested doubts with respect to certain species included in the lists, and shall here add a few observations on such of the others as seem to require it.

Acrostichum aureum, L. was compared, and judged to agree, with American specimens; and I have therefore placed it in the 2nd list, without, however, meaning to decide whether those plants originally combined with *A. aureum*, and now separated from it, should be regarded as species or varieties.

Fuirena umbellata, L. fil. from Congo, has its umbels somewhat less divided than either the American plant or that from the continent of India; but from specimens

collected in the Nicobar Islands, this would appear to be a variable circumstance.

Gloriosa superba, L. which seems to be very general along the whole of the west coast of Africa, is considered as a variety of the Indian plant by M. Lamarck. This African variety has no doubt given rise to the establishment of the second species of the genus, namely *G. simplex*, which Linnaeus adopted from Miller,¹ and which Miller founded on the account sent to him by M. Richard, of the Trianon Garden, along with the seeds of what he called a new Gloriosa, brought from Senegal by Adanson, and having blue flowers. Miller had no opportunity of determining the correctness of this account; for though the seeds vegetated, the plant died without flowering; but he added a character not unlikely to belong to the seedling plants of *G. superba*, namely the want of tendrils. Adanson himself,⁴⁸³ indeed, notices what he considers a new species of Gloriosa in Senegal,² but he says nothing of the colour of its flowers, which he would hardly have omitted, had they been blue: that his plant, however, was not without tendrils may be inferred from their entering into the character he afterwards gave of the genus,³ as well as from M. Lamarck's account of his variety β of *G. superba*,⁴ which he seems to have described from Adanson's specimens. And as no one has since pretended to have seen a species of this genus, either with blue flowers, or leaves without tendrils, *G. simplex*, which has long been considered as doubtful, may be safely left out of all future editions of the Species Plantarum. As the supposed *G. superba* of this coast, however, seems to differ from the Indian plant in the greater length and more equal diameter of its capsule, it may possibly be a distinct species, though at present I am inclined to consider it as only a variety.

Sphenoclea zeylanica, Gært. I have compared this plant from Congo with specimens from India, Java, China,

¹ *Gloriosa* 2, *Mill. Dict. ed. 7.*

² Nouvelle espèce de Methonica, *Hist. Nat. du Senegal*, p. 137.

³ Mendoni, *Fam. des Plant.* 2, p. 48.

⁴ *Encyc. Method. Botan.* 4, p. 134.

Cochinchina, Gambia, Demerary, and the island of Trinidad.

I was at one time inclined to believe that *Sphenoclea*¹ might be considered as an attendant on Rice, which it very generally accompanies, and with which I supposed it to have been originally imported from India into the various countries where it is found. This hypothesis may still account for its existence in the rice fields of Egypt;² but as it now appears to have been observed in countries where there is no reason to believe that rice has ever been cultivated, the conjecture must be abandoned.

Hibiscus tiliaceus, L. agrees with the plant of India, except in a very slight difference in the acumen of the leaf; but the specimens from America have their outer calyx proportionally longer.

Sida periplocifolia, L. corresponds with American specimens; those in Hermann's herbarium, from which the species was established, have a longer acumen to the leaf: in other respects I perceive no difference.

Waltheria indica, L. I consider *W. americana* to [484] be a variety of this sportive species, which seems to be common to all equinoctial countries.

Urena americana, L. and *U. reticulata*, Cavan. appear to me not to differ specifically; and the plant from Congo agrees with West India specimens.

Jussiaea erecta, L. from Congo, agrees with West India specimens in having linear leaves; a specimen, however, from Miller's herbarium, which has been compared, and is said to correspond, with that in the Linnean collection, has elliptical leaves.

Chrysobalanus Icaco, L. has its leaves more deeply retuse than any American specimens I have seen, but in this respect it agrees with Catesby's figure.

Guilandina Bondue, L. from which *G. Bonducella* does not appear to differ in any respect, is one of the most general plants on the shores of equinoctial countries.

¹ *Rapinia herbacea* of the Flora Cochinchinensis (p. 127) is certainly *Sphenoclea zeylanica*, as appears by a specimen sent to Sir Joseph Banks by Loureiro himself.

² *Delile Flor. Egypt. illust. in op. cit.*

Pterocarpus lunatus, L. I have compared the plant from Congo with an authentic specimen from the Linnean herbarium, the examination of which proves that the appearance of ferruginous pubescence in the panicle, noticed in Linné's description, is the consequence of his specimen having been immersed in spirits.

Several of the plants included in the fourth list, I am inclined to consider varieties only of the species to which they are referred; but I have placed them among the more doubtful plants of this list, as their differences seem to be permanent, and are such as admit of being expressed. One of these is

Cardiospermum grandiflorum, Sw. of which the specimens from Congo differ somewhat in inflorescence from the West India plant.

Paulinia pinnata, L. is distinguished rather remarkably from the American plant by the figure of the leaflets, which approach to cuneiform, or widen upwards, but I can perceive no other difference.

Pterocarpus Ecastophyllum, L. differs merely in the want of the very short acumen or narrow apex of the leaf, which I have constantly found in all the West India specimens I have examined.

Gisekia pharnaceoides, L. from Congo, has nearly linear leaves; but I have seen specimens from Koenig with leaves of an intermediate form.

I shall conclude this essay, already extended considerably beyond my original plan, with a general statement of the proportion of new genera and species contained in Professor Smith's herbarium.

[485] The whole number of species in the collection is about 620; but as specimens of about thirty of these are so imperfect as not to be referable to their proper genera, and some of them not even to natural orders, its amount may be stated at 590 species.

Of these about 250 are absolutely new: nearly an equal number exist also in different parts of the west coast of equinoctial Africa, and not in other countries; of which,

however, the greatest part are yet unpublished : and about 70 are common to other intratropical regions.

Of unpublished genera there are 32 in the collection ; twelve of which are absolutely new, and three, though observed in other parts of this coast of equinoctial Africa, had not been found before in a state sufficiently perfect, to ascertain their structure ; ten belong to different parts of the same line of coast ; and seven are common to other countries.

No natural order, absolutely new, exists in the herbarium ; nor has any family been found peculiar to equinoctial Africa.

The extent of Professor Smith's herbarium proves not only the zeal and activity of my lamented friend, but also his great acquirements in that branch of science, which was his more particular province, and to his excessive exertions in the investigation of which he fell a victim, in the ill-fated expedition to Congo.

Had he returned to Europe, he would assuredly have given a far more complete and generally interesting account of his discoveries than what is here attempted : and the numerous facts which he could no doubt have communicated respecting the habit, the structure, and the uses of the more important and remarkable plants, would probably have determined him to have followed a very different plan from that adopted in the present essay.

It remains only that I should notice the exemplary diligence of the Botanic Gardener, Mr. David Lockhart, the only survivor, I believe, of the party by whom the river above the falls was examined, in that disastrous journey which proved fatal to the expedition.

From Mr. Lockhart I have received valuable information concerning many of the specimens contained in the herbarium, and also respecting the esculent plants observed on the banks of the Congo.

February 2, 1818.

LIST OF PLANTS

COLLECTED BY

THE OFFICERS, &c., IN CAPT. ROSS'S VOYAGE,

ON THE

COASTS OF BAFFIN'S BAY.

BY

ROBERT BROWN, F.R.S.

[Reprinted from "*A Voyage of Discovery for the purpose of exploring Baffin's Bay*," by John Ross, K.S., Captain Royal Navy. Appendix, pp. cxli—cxliv.]

LONDON:

—
1819.

LIST OF PLANTS

[exli]

COLLECTED ON THE

COASTS OF BAFFIN'S BAY,

From Lat. 70° 30' to 76° 12' on the East Side;

AND AT

POSSESSION BAY,

In Lat. 73° on the West Side.

The List is formed chiefly from Capt. Ross's collection; a considerable number of additional species to which (S.) is annexed, were collected by Capt. Edward Sabine, and a few marked (F.) were received from Mr. Fisher, the surgeon of the Alexander.

TRIANDRIA.

- Eriophorum polystachyon*, Linn.
Alopecurus alpinus, Smith, *Flor. Brit.* iii, p. 1386.
Agrostis algida, *Phipps's Voy.* p. 200.
Wahlenb. *Lapp.* p. 25, t. i. (S.) *Gra-*
mnen sui generis.
— *paradoxa*, nov. sp. Vix hujus,
forsan proprii, generis.
Poa laxa, Willden. *Sp. Pl.* i, p. 386.

HEXANDRIA.

- Rumex digynus*, L. *Distinctum genus*
(*DONIA nob.*¹) efformat.

DECANDRIA.

- Andromeda tetragona*, L.

Pyrola rotundifolia, L.? Absque
floribus haud determinanda.

Saxifraga oppositifolia, L. [cxlii]

— *propinqua*, nov. sp. S. Hir-
culo, cui proxima, minor, et diversa
præsertim calycibus nudis et petalis
inappendiculatis.

— *flagellaris*, Sternberg, *Saxifr.*
p. 25, t. 6. S. *setigera*, Pursh,
Amer. i, p. 312. (F.)

— *trieuspidata*, Willden *Sp.*
Pl. ii, p. 657. (S.)

— *cæspitosa*, L. Notis non-
nullis differt, forsitan distineta.

— *petiolaris*, nov. sp. proxima
S. *rivulari*. (S.)

— *cernua*, L.

Silene acaulis, L.

Lychnis apetala, L.

¹ Corrected by Mr. Brown in the second edition of the voyage to "OXYRIA,
Hill."—EDIT.

Lychnis triflora, nov. sp. (S.)
Cerastium alpinum, L.

ICOSANDRIA.

Potentilla pulchella, nov. sp. P.
 sericeæ affinis. (S.)
 —— *grœulandica, nov. sp.?* nimis
 affinis *P. frigidæ* et *Brauniæ*. (S.)
Dryas integrifolia. Vahl in Flor.
Dan. 1216.

POLYANDRIA.

Papaver nudicaule, L.
Ranunculus —, sulphureus forte vel
 glacialis; species e fragmentis non
 determinanda. (F.)

DIDYNAMIA.

Pedicularis hirsuta, L.

CLXIII] TETRADYNAMIA.

Draba muricella, Wahlenb. Lapp. p.
 174, t. xi, f. 2? (S.)
 —— *oblongata, nov. sp.* (S.)
 —— *corymbosa, nov. sp.?* præce-
 denti valde affinis et ambæ *D. ru-*
pestri (Hort. Kew. iv, p. 91)
 proximæ. (S.)
Cochlearia fenestrata, nov. sp. A C.
 anglica et danica, quibus valde
 propinquæ, differt valvulis subaveniis
 et dissepimenti elliptico-lanceolati
 axi dehiscente.

SYNGENESIA.

Leontodon Taraxacum, L.? varietas
 nana? vix species distincta.

MONŒCIA.

Carex compacta, nov. sp. C. pullæ
 affinis. (F.)

Algarum genus? ? Confervis simplicissimis et Tremellæ cruentæ (*Eng. Bot.*
 1800) quodammodo affine? ? Minute globules, the colouring matter of the
 Red Snow, of which extensive patches were seen in lat. $76^{\circ} 25' N.$, and long.
 $65^{\circ} W.$

DIŒCIA.

Empetrum nigrum, L.
Salix arctica, nov. sp.
 —— specimen mancum dubiæ
 speciei, præcedenti proximæ.

POLYGAMIA.

Hierochloe alpina, Br. *Holcus al-*
pinus, Wahlenb. Lapp. p. 51. (S.)

CRYPTOGAMIA.

Lycopodium Selago, L. (S.)
Polytrichum juniperinum, Hooker and
Taylor, Musc. Brit. p. 25.
Orthotrichum cupulatum, Musc. Brit.
 p. 72?
Trichostomum lanuginosum, Musc.
Brit. p. 60.
Dicranum scoparium, Musc. Brit. p.
 57. [exliv
Mnium turgidum, Wahlenb. Lapp. p.
 351.
Bryum —, absque capsulis.
Hypnum aduncum, L.
Jungermannia —, fructificatione
 nulla.
Gyrophora hirsuta, Achar. Syn. p. 69.
 (S.)
 —— *erosa, Achar. Syn.* p. 65. (S.)
Cetraria islandica, Achar. Syn. p. 229.
 —— *nivalis, Achar. Syn.* p. 228.
Cenomyce rangiferina, Achar. Syn. p.
 277.
 —— *fimbriata, Achar. Syn.* p.
 254?
Dufurea? rugosa, nov. sp.
Cornicularia bicolor, Achar. Syn. p.
 301.
Usnea? —, *nov. sp.?* absque scu-
 tellis.
Ulva crispa. Lightf. Scot. 972?

CATALOGUE OF PLANTS

FOUND IN

SPITZBERGEN

BY

CAPTAIN SCORESBY.

BY

ROBERT BROWN, F.R.S.

[Reprinted from "An Account of the Arctic Regions," by W. Scoresby,
Jun., F.R.S.E. Vol. 1, Appendix, No. V, pp. 75, 76.]

EDINBURGH.

—
1820.

CATALOGUE OF PLANTS

FOUND IN

S P I T Z B E R G E N.¹

[75]

HEXANDRIA.

Luzula campestris, *Juncus campes-tris*, *L.*

DECANDRIA.

Andromeda tetragona, *Linné*.

Saxifraga oppositifolia, *L.*

— *cernua*, *L.*

— *var. nivalis*, *L.*

— *caespitosa*, β *grænlandica*,
Wahlenb. lapp., 119.

Cerastium alpinum, α *hirsutum*,
Wahlenb. lapp., 136.

ICOSANDRIA.

Dryas octopetala, *L.*

POLYANDRIA.

Papaver radicatum, *Rottb.* Vix di-versum a *P. nudicaule*, *L.*

Ranunculus sulphureus, *Soland.* in
Phipps' Voyage.

DIDYNAMIA.

Pedicularis hirsuta, *L.*

TETRADYNAMIA.

Cochlearia grænlandica? Vel *C. Au-glica*, *Wahl. lapp.*

Cardamine bellidifolia, *L.*

Draba alpina, *L.*

DICEIA.

Salix polaris, *Wahlenb. lapp.*, 261.

CRYPTOGAMIA.

Trichostomum lanuginosum.

Hypnum dendroides.

— *rufescens*?

Bryum ventricosum, *Smith brit.*

— *ligulatum*?

Dicrani species?

Andreæa alpina.

Ulva?

Fucus *forsau* nov. sp. prope [76]
alatum, sed absque fructific.

— *plumosus*.

— *sinuatus*.

Conferv?

— *nigra*?

Cenomyce furcata, *Achar. Syn.*, 276.

— *pocillum*, *Id.*, 253.

Solorina crocea, *Id.*, 8.

Alectoria jubata, β *chalybeiformis*, *Id.*
291.

Leccanora murorum, var. *Id.* 181.

Lecidea atrovirens, *Id.* 24.

Gyrophora hirsuta, *Id.* 69.

— *erosa*, *Id.* 65.

— *proboscidea*, *Id.* 64.

Endocarpum sinopicum, *Id.* 98.

Sphærophoron coralloides, *Id.* 287.

Parmelia stygia, *Id.*

— *recurva*, *Id.* 206?

— sp. nov.? sed absque fruc-tific.

Peltidea eauina?

Cetraria nivalis, *Id.* 228.

Cornicularia aculeata, β *spadicea*, *Id.*
300.

Usnea? prope *U. melaxantham*, *Id.*
303.

Stereocaulon paschale, *Id.* 284.

¹ This list includes the whole of the plants I met with, excepting some of the larger fuci, in three or four visits to the shore about King's Bay and Mitre Cape. Some of the specimens being imperfect, or without fructification, their species could not always be determined.—W. SCORESBY.

CHLORIS MELVILLIANA.

A

LIST OF PLANTS

COLLECTED IN

MELVILLE ISLAND,

(LATITUDE 74°—75° N. LONGITUDE 110°—112° W.)

IN THE YEAR 1820;

BY THE OFFICERS OF THE VOYAGE OF DISCOVERY

UNDER THE ORDERS OF

CAPTAIN PARRY.

WITH

CHARACTERS AND DESCRIPTIONS

OF THE

NEW GENERA AND SPECIES.

BY

ROBERT BROWN, F.R.S., L.S.,

MEMBER OF THE IMPERIAL ACADEMY NATURE CURIOSORUM, OF THE ROYAL
ACADEMY OF SCIENCES OF STOCKHOLM, AND OF THE ROYAL SOCIETY
OF COPENHAGEN; CORRESPONDING MEMBER OF THE ROYAL
ACADEMIES OF SCIENCES OF PARIS, BERLIN, AND
MUNICH, &c.

[Reprinted from 'A Supplement to the Appendix to Captain Parry's
Voyage', pp. cclxi—ccc.]

LONDON:

1823.

LIST OF PLANTS

[cclxi]

COLLECTED IN

MELVILLE ISLAND.

THE following list of the Plants observed in Melville Island, chiefly in the vicinity of Winter Harbour, is drawn up from the Herbaria of Captain Sabine, Mr. Edwards, Mr. James Ross, Captain Parry, Mr. Fisher, and Mr. Beverley, whose names are here given in the order of the extent of their collections.

To Captain Parry, Mr. Edwards, Mr. Ross, and Mr. Fisher, I am indebted for complete series of specimens of their respective collections ; and I have to offer my acknowledgments to Captain Sabine for having allowed me freely to examine his more extensive herbarium, and to retain it until he was about to leave England, in October, 1821, when the whole, in compliance with his request, was returned to him.

The delay that has taken place in the publication of the present account has been in part owing to the state of my health during a considerable portion of the time that has elapsed since the collections were placed in my hands. I have also experienced much greater difficulty than I had anticipated in determining many of the species ; arising either from their extremely variable nature, from the incomplete state of the specimens contained in the collections, or from the want of authentic specimens of other countries, [cclxii] with which it was necessary to compare them. I may

notice, likewise, as a third cause of the delay, the greater extent of my original plan, which included remarks on the state and relative proportions of the primary divisions and natural orders contained in the list; a comparison with the vegetation of regions of nearly similar climates; and observations on the range of those species common to Melville Island and other parts of the world. Towards the completion of this plan I had made considerable progress. But to have satisfactorily treated some of the subjects referred to would have required more time than I have had it in my power to devote to them, and in several cases better materials than I have hitherto been able to obtain.

I have consequently found it necessary to relinquish, for the present, this part of my plan,¹ and to confine myself to a systematic list, adding only characters and descriptions ^{ccclxiii]} of the new or imperfectly known genera and species; the only indication left of my intention to treat any of the subjects alluded to being a greater number of references

¹ I shall here offer a single remark on the relative proportions of the two primary divisions of Phænogamous plants.

In my earliest observations on this subject I had come to the conclusion that from 45° as far as 60° or perhaps 65° of north latitude, the proportion of Dicotyledonous to Monocotyledonous plants gradually diminished. (*Flinders' voy.* 2, p. 538. *Antè*, p. 8.) But from a subsequent examination of the list of Greenland plants, given by Professor Giesecke (Art. "Greenland," in Brewster's *'Edinburgh Encyclopædia'*), as well as from what I had been able to collect respecting the vegetation of alpine regions, I had supposed it not improbable that in still higher latitudes, and at corresponding heights above the level of the sea, the relative numbers of these two divisions were again inverted (*Tuckey's Congo*, p. 423. *Antè*, p. 103); in the list of Greenland plants referred to, Dicotyledones being to Monocotyledones as four to one, or in nearly the equinoctial ratio; and in the vegetation of Spitzbergen, as well as it could be judged of from the materials hitherto collected, the proportion of Dicotyledones appearing to be still further increased.

This inversion in the cases now mentioned was found to depend at least as much on the reduction of the proportion of Gramineæ, as on the increase of certain Dicotyledonous families, especially Saxifrageæ and Cruciferæ.

The Flora of Melville Island, however, which, as far as relates to the two primary divisions of Phænogamous plants, is probably as much to be depended on as any local catalogue hitherto published, leads to very different conclusions; Dicotyledones being in the present list to Monocotyledones as five to two, or in as low a ratio as has been anywhere yet observed; while the proportion of Grasses, instead of being reduced, is nearly double what has been found in any other part of the world (see Humboldt, in *'Dict. des Sciences Nat.'*, tom. 18, table at p. 416); this family forming one fifth of the whole Phænogamous vegetation.

to authors than is absolutely necessary for the present list, though essential to my original design.

With this more limited plan, and with its execution, as far at least as regards the determination of several of the species, I am so little satisfied, that had the publication depended entirely on myself, and related solely to the present essay, I should have deferred it still longer, probably until the return of Captain Parry from the arduous enterprise in which he is now embarked.

I have, however, to express my regret for the delay that has already taken place, as it has prevented the appearance of the valuable memoirs in other departments of Natural History, which have been long ready for publication ; and also as it has till now deprived Botanists of the excellent figures so admirably illustrating the structure of the plants selected for engraving, and for which it is hardly necessary to add that I am indebted to the friendship of Mr. Bauer.¹

¹ It has not been thought necessary to reproduce the engravings illustrative of the plants described in the present memoir ; in the Appendix to Captain Franklin's journey ; in Mr. Clarke Abel's journey in the interior of China ; and in Captain King's survey of the coasts of Australia. For these plates, in all ten in number, the reader is referred to the works in which they originally appeared.—EDIT.

ccclxiv.]

DICOTYLEDONES.

RANUNCULACEÆ.

1. **RANUNCULUS NIVALIS**, foliis radicalibus elongato-petiolatis dilatatis lobatis : lobis subovatis ; caulinis subsessilibus palmatis, caule erecto subunifloro, petalis obovatis integerrimis longioribus calyce hirsutissimo, stylis rectiusculis ovaria glabra æquantibus.

Ranunculus nivalis, *Wahlenb. lapp.* p. 156. *Schlechtend. ranuncul. sect. post.* p. 14.

β . folia radicalia basi cuneata vix ad medium lobata, lobo medio semiovato basi latiore, petala orbiculato-obovata calyce hirsutissimo sesquilongiora.

Ranunculus nivalis β . *Wahlenb. lapp.* p. 157 (exclus. syn. *Martens spitzb.*)

Ranunculus sulphureus, *Soland. in Phipps' voy.* p. 202, (fide speciminis unici biflori absque foliis radicalibus, in *Herb. Banks*). *De Cand. syst. nat.* p. 274 (exclus. syn. *Martens spitzb.*, *Laxmanni*, *Willdenovii* et *Smithii*). *Br. spitzb. pl. in Scoresby's arct. reg.* 1, *append.* p. 75. (*Antè*, p. 181) *Richardson in Franklin's journ.* p. 742.

γ . folia radicalia basi subcuneata v. transversa alte lobata, lobo medio cuneato-obovato basi angustiore.

Obs. Varietas γ , cuius exemplaria duo tantum à nobis visa proxime accedit a quæ, in Insula Melville haud observata, sequentibus notis distinguenda.

a . folia radicalia reniformia alte lobata, lobo medio cuneato-obovato basi angustiore.

Ranunculus nivalis, *De Cand. syst. nat.* 1, p. 273, exclus. cit. ad *Sw. in act. holm.* 1789, p. 47, quæ *R. pygmæus*, et syn. *Martens spitzb.* ad var. β pertinente.

A *R. nivali* differt *R. frigidus Willden.* foliis radicalibus minus alte incisis lobulis pluribus, petalis obcordatis venis anastomozantibus, quæ in *R. nivali* distinctæ, et statura paulo majore.

2. **RANUNCULUS SABINII**, foliis radicalibus elongato-petiolatis tripartitis: lobis ellipticis: lateralibus semibifidis; caulinis sessilibus tripartitis linearibus, calycibus hirsutis petala retusa subæquantibus.

Obs. Planta inter R. nivalem et pygmaeum media in Herb. D. Sabine exstat, ulterius examinanda, forsitan haud distincta à R. nivali cuius cfr. ic. Flor. Dan. 1699, ubi petala retusa et folium radicale pinnatifidum.

3. **RANUNCULUS HYPERBOREUS**, foliis petiolatis trifidis: lobis divaricatis obtusis: lateralibus subbifidis medio integerrimo, caule repente, acheniis laevibus stigmate sessili apiculatis.

Ranunculus hyperboreus, Rottb. in act. Hafn. 10, p. 458, t. 4, n. 16. *Flor. Dan.* 331. *Zæg. flor. island.* in Olafs. reise 2, p. 237. *Willden. sp. pl.* 2, p. 1322. *Pers. syn.* 2, p. 104. *Wahlenb. lapp.* p. 158. *De Cand. syst. nat.* 1, p. 272. *Schlechtend. ranuncul. sect. post.* p. 12.

Ranunculus foliis subrotundis trilobis integerrimis, [ecclv] caule repente. *Gmel. Sib.* 4, p. 204, t. 83, b.

DESC. *Herba* pusilla, glabra. *Folia* elongato-petiolata, alte trifida, lobo medio ovali, sæpiissime indiviso, lateralibus sæpius bifidis lobulo exteriore minore, nunc indivisis, rarissime trifidis. *Petioli* filiformes basi vaginantes. *Pedunculi* oppositifolii, petiolum subæquantes, sæpius pilis sparsis adpressis. *Calyx* tetraphyllus nunc triphyllus (an unquam 5-phyllus?), foliolis concavis pilosiusculis. *Petala* 5, calyce manifeste longiora, *lamina* obovata, intus nitenti trinervi, *ungue* linearis, apice foveola angusta marginata. *Stamina* 15—18, petalis breviora, *filamentis* inæqualibus, *antheris* ovalibus. *Achenia* (30 circiter) in capitulum ovatum congesta, stigmate brevi mucronulata.

4. **RANUNCULUS AFFINIS**, foliis radicalibus pedato-multi-fidis petiolatis; caulinis subsessilibus digitatis; lobis omnium linearibus, caule erecto 1-2-floro cum calycibus ovariiisque pubescentibus, fructibus oblongo-cylindraceis, acheniis rostro recurvo.

Obs. R. auricomo proxima species.

5. **CALTHA ARCTICA**, caule repente, foliis reniformibus crenato-repandis obtusis, folliculis (12—16) imbricatis, stigmate persistente adnato apice recurvo, antheris linearibus viginti pluribus.

Obs. Affinitate C. radicanti accedit; figura foliorum et caule repente convenit cum C. natante, quæ facile distinguenda pistillis stamina longitudine et numero superantibus, in capitulum sphæricum dense congestis, stigmatibus rectis simplicibus subsessilibus, antheris ovalibus, floribus albis foliisque aliquoties minoribus, et facie diversissima.

PAPAVERACEÆ.

6. **PAPAVER NUDICAULE**, *Linn.* *sp. pl. ed. 2, p. 725.* *Flor. Dan. 41.* *Willden. sp. pl. 2, p. 1145.* *Pers. syn. 2, p. 62.* *Br. in Ross' voy. ed. 2, vol. 2, p. 193.* (*Antè, p. 178.*) *Hooker in Scoresby's Greenl. p. 413.*

Papaver nudicaule γ radicatum, *De Cand. syst. nat. 2, p. 70.*

Papaver radicatum, *Rottb. in act. Hafn. 10, p. 455, t. 8, p. 24.* *Br. spitzb. pl. in Scoresby's arct. reg. 1, append. p. 75.* (*Antè, p. 181.*)

CRUCIFERÆ.

7. **DRABA ALPINA**, *Linn. sp. pl. ed. 1, p. 642, ed. 2, p. 896.* *Willden. sp. pl. 3, p. 425.* *Pers. syn. 2, p. 190.* *Wahlenb. lapp. p. 173.* *De Cand. syst. nat. 2, p. 338.*

α. siliculæ glabræ.

Draba alpina, *Herb. Linn.*

β. siliculæ pilosæ.

Draba alpina, *Br. spitzb. pl. in Scoresby's arct. reg. 1, append. p. 75.* (*Anté, p. 181*)

ccclxvi] 8. **DRABA PAUCIFLORA**, scapis aphyllis pedicellisque pilosis, foliis lanceolatis integerrimis pilis furcatis simplicibusque, petalis (flavis) spathulatis calycem hirsutum vix superantibus, ovariis glabris.

Obs. Dubia species, alpinæ proxima, cujus exemplar unicum in Herb. D. Sabine vidi.

9. DRABA LAPPONICA, *De Cand. syst. nat. 2, p. 344.*

Draba androsacea, Wahlenb. lapp. p. 174, t. 11, f. 5,
exclus. syn.

DESC. *Radix* fusiformis, fibris nonnullis longis simplicibus, multiceps. *Caules* breves, divisi, basi reliquiis petiolorum emarcidis albis squamati, partiales semunciales, dense foliati. *Folia* lanceolata v. oblongo-lanceolata acutiuscula, plana, integerrima, venis alte immersis anastomozantibus, marginibus ciliatis pilis patentibus simplicibus paucissimisque furcatis, paginis adultorum glabris, novellorum pubescenti ramosa substellata conspersis. *Scapi* unciales—sesquiunciales, saepissime aphylli, nunc folio unico lanceolato-lineari instructi, glaberrimi, laeves. *Corymbi* 5-6-flori pedicellis glaberrimis patentibus, inferioribus flore saepe longioribus. *Calyx*: foliolis concavis, ovalibus, extus vel pilis nonnullis simplicibus conspersis vel saepius glaberrimis. *Petala* alba, calyce duplo longiora, *ungue* brevi, *lamina* obovata venosa. *Stamina* tetradynama, calyce longiora, petalis breviora, *filamentis* edentulis, *antheris* uniformibus, subrotundis ochroleucis. *Ovarium* sessile ovatum glabrum. *Stylus* brevissimus. *Stigma* capitato-bilobum, stylo manifeste latius. *Siliculæ* racemoso-corymbosæ, lanceolato-ovatae, glabræ, stigmate subsessili apiculatae, pedicellis patentibus paulo longiores polyspermæ. *Semina* biseriata, immarginata.

10. COCHLEARIA FENESTRATA, siliculis ellipticis ovalibus, valvis subaveniis, dissepimento elliptico-lanceolato axi saepius fenestrato, foliis radicalibus cordatis integerrimis; caulinis spathulato-oblongis subdentatis.

Cochlearia fenestrata, Br. in Ross' voy. ed. 2, vol. 2, p. 193. (Ante, p. 178.) De Cand. syst. nat. 2, p. 367.

DESC. Species polymorpha. *Folia* radicalia reniformicordata, citò decidua; caulinis sessilia, integra vel paucidentata. *Calyx* saepe purpurascens. *Petala* alba, obovata, calyce longiora. *Antheræ* subrotundæ. *Stylus* brevis.

Stigma capitatum. Silicula obtusa, stylo brevi cum stigmate apiculata. Valvæ ventricosæ, venis altè immersis. Dissepimentum nunc ellipticum, nunc oblongum v. angustato-oblongum, e lamellis duabus tenuissimis facile separandis; loculi polyspermi. Funiculi umbilicales basibus connexis ope membranae angustæ dissepimento parallelæ. Semina contraria, h. c. cruribus embryonis invicem septoque parallelis, ovata, reticulata, immarginata.

Obs. In exemplari unico Siliculas passim triloculares trivalves dissepimento pariter fenestrato observavi.

PLATYPETALUM.

CHAR. GEN. *Silicula ovalis, valvis convexiusculis. Semina biseriata. Cotyledones incumbentes. Stylus brevissimus. Calyx sub-patens. Petalorum laminæ dilatatae.*

[clxvii] *Habitus fere Brayæ quacum structura floris cotyledonibusque incumbentibus convenit; satis diversum pericarpii forma. Affine quoque Subulariæ esse videtur, quæ ob cotyledones angustas bicrures, in embryone tantum bicruri ab eadem tribu minime removenda. Notis fructificationis pluribus accedit etiam Stenopetalo nob. quod calyce clauso, petalis subulatis! glandulis receptaculi et habitu diversissimum, nec revera affine.*

11. PLATYPETALUM PURPURASCENS, stigmate bilobo patenti, stylo manifesto, scapis nudis unifoliisque pubescen-tibus, siliculis glabriusculis.

DESC. *Radix* perennis, fusiformis sœpe multicaulis. *Caules* breves, indivisi, basi denudati, supra dense foliati. *Folia* lanceolata, obtusiuscula, integerrima, rarius dente uno alterove instructa, crassa, avenia, lœte-viridia, apice pilis nonnullis albis acutis simplicibus rariusve furcatis plerumque obsita; *petioli* basi dilatati membranacei pallidi. *Scapi* terminales, sœpius aphylli, vix unciales, basi nunc glabrat. *Corymbus* 4-6-florus, ebracteatus. *Calyx* modice patens, sepalis ovatis concavis subæqualibus, extus fusco-purpureis, limbo angusto albo, apice sœpe pilosiusculis quandoque glaberrimis, tardius deciduis. *Petala* alba, purpureo dilute tincta, unguiculata, laminis dilatatis, latioribus quam

longioribus, integris, obtusissimis, unguis lineares superantibus. *Glandulæ* receptaculi quatuor, per paria approximatæ, latera filamentorum breviorum stipantes. *Stamina* tetradynama, *filamentis* edentulis distinctis; *antheris* uniformibus subrotundis ochroleucis. *Ovarium* sessile, ovale, pubescens pilis acutis simplicibus numerosis albis. *Stylus* brevissimus, tamen manifestus. *Stigma*: lobis patentibus, obtusis, papulosis. *Siliculæ* corymbosæ, ovales, stylo brevissimo cum stigmate patenti apiculatæ, biloculares, polyspermae, valvis modice concavis, dissepimento completo. *Semina* immarginata, fusca.

12. PLATYPETALUM DUBIUM, stigmate indiviso subsessili, siliculis scapisque pubescentibus.

Obs. Floribus ignotis dubiae generis planta cuius exemplaria tria in Herb. D. Sabine exstant. Cotyledones certè incumbentes et lineares, basibus tamen crus radiculare embryonis vix occupantibus.

EUTREMA.

Siliqua (abbreviata) anceps, valvis carinatis, dissepimento incompleto! *Cotyledones* incumbentes.

Herba habitu omnino Brayæ et Platypetalii, quibus maxime affine genus, distinguendum tamen facile siliqua ancipiti, dissepimento incompleto, et seminum funiculis.

13. EUTREMA EDWARDSII.

DESC. *Herba* perennis, glabra, 2-3-uncialis. *Radix* fusiformis, crassa, biuncialis, striis transversis tenuibus saepe subannulata, fibrillas numerosas exserens, multicaulis. *Caules* simplicissimi, erecti, paucifolii. *Folia* radicalia elongato-petiolata, ovato-lanceolata, integerima rarissime paucidentata, crassiuscula, plana, uninervia, venis alte immersis crebre anastomozantibus inconspicuis, glaberrima: [cclviii] *petiolis* folio 4-5-ies longioribus, linearibus membranaceis, albicantibus, adversus lucem trinerviis; *caulina* radicalibus conformia, inferiora brevi petiolata, superiora subsessilia.

Corymbi 7-10-flori, densi, folio florali sessili saepe subtensi, cæterum ebracteati. *Calyx* glaber, sepalis æqualibus, ovatis, obtusis, modice concavis, trinerviis, extra medium purpurascenscentibus, insertione parum inæqualibus. *Petala* alba, calyce sesquilongiora, *ungues* breves, *laminæ* obovatæ (vel ex ovali obovatæ), obtusæ, integerrimæ, planæ, obsoletè uninerviæ, vix manifeste venosæ. *Glandulæ* receptaculi quatuor, per paria approximatæ, latera filamentorum breviorum stipantes, parvæ. *Stamina* tetradynama. *Filamenta* subulata, glabra, edentula, duo lateralia paulo breviora basi aversa (acie nec superficie plana ovarium spectanti). *Antheræ* uniformes, ovato-subrotundæ, incumbentes, infra medium affixæ, loculis parallelo-contiguis, longitudinaliter dehiscenscentibus. *Pollen* flavum, sphæricum, simplex quantum observare potui per lentem centies augentem. *Ovarium* sessile, glabrum, oblongo-ovatum, uniloculare, placentis duabus parietibus polyspermis. *Stylus* brevissimus vix manifestus. *Stigma* capitatum, indivisum v. simibilobum, stylo vix amplius. *Siliquæ* (siliculosæ) racemosæ, erectæ, lineari-lanceolatæ, ancipites, glaberrimæ, vix trilineares, stigmate obtuso indiviso subsessili apiculatae. *Valvæ* carinatæ, carina manifesta, venis immersis, cortice demum ad margines solubili, in disco arctius adherenti; *replum* cortice pariter separabili. *Dissepimentum*, præter basin apicemque ubi sæpius completum, plerumque margo perangustus ad utrumque latus cuius processus membranaceus angustior e quo funiculi umbilicales brevissimi obtusi crassi papillæformes orti. *Semina* immarginata, fusca, laevia. *Cotyledones* incumbentes, lineari-oblongæ, plano-convexi-usculæ, basi attenuata brevi in crure radiculari sita.

OBS. This species is named in honour of Mr. Edwards, Surgeon of the Hecla, from whose extensive and well-preserved herbarium I have derived great assistance in drawing up the present list, and in which only perfect specimens with ripe siliquæ of *Eutrema Edwardsii* were found.

EXPLICATIO TABULÆ—A.¹

EUTREMA EDWARDSII.—1. Planta florida, et 17. fructifera; utraque magnitudine naturali. Sequentes magnitudine auctæ; 2. flos integer; 3. petalum; 4. flos petalis orbatus; 6. sepalum (foliolum calycis); 6. stamina et pistillum integumentis floralibus avulsiis; 7. stamen longius; 8. stamen brevius; 9. pollen ad augmentum 200; 10. pistillum receptaculo insidens à facie visum; 11. idem duplo auctius; 12. ejusdem portio transverse secta; 13. idem valvis avulsiis; 14. pistillum à latere visum; 15. idem valvis avulsiis; 16. placentæ parietalis portio cum ovulis; 18. siliqua matura dehiscens à facie visa; 19. siliqua matura clausa à latere visa; 20. eadem valvis orbata; 21. eadem duplo auctius; 22. semen; 23. idem transverse sectum; 24. idem longitudinaliter sectum; 25. embryo.

PARRYA.

CHAR. GEN. *Siliqua* lato-linearis, *valvis* venosis. *Semina* biseriata, *testæ epidermide* laxo, corrugato. *Cotyledones* accumbentes. *Stigmata* approximata basibus connatis [cclxix] in stylum (brevissimum) decurrentibus. *Filamenta* edentula.

Herbæ perennes, subacaules. Folia radicalia integerrima v. dentata, crassiuscula, opaca, venis immersis inconspicuis, petiolorum basibus dilatatis scariosis semivaginantibus. Scapi radicales, aphylli, ebracteati. Flores purpurei. Calyx sub-patens. Glandulæ hypogynæ 4, filamenta longiora extus stipantes.

OBS. Affinitate proximum genus Arabidi, diversum siliquarum figura, structura seminum et stigmatis, et denique habitu.

This Genus is named in honour of CAPTAIN PARRY, the distinguished commander of the Expedition in which it was discovered, and whose herbarium contained very complete specimens of the species here described.

¹ See Note at p. 187.

14. PARRYA ARCTICA.

Parrya, siliquis linear-i-oblongis, antheris ovalibus, foliis (fere omnibus) integerrimis, pedunculis glaberrimis.

DESC. *Herba* humilis, perennis, glaberrima. *Radix* perpendicularis, crassa, sublignea, striis transversis tenuibus notata, saepe multiceps. *Caules* brevissimi, dense foliati. *Folia* petiolata, lanceolata passimve spathulato-lanceolata, integerrima, nonnulla rarissime paucidentata, crassiuscula, opaca, immerse uninervia, venis altè immersis inconspicuis. *Petioli* dimidio superiore angusto linear-i textura laminæ, inferiore dilatato semivaginanti scarioso albicanti. *Scapus* caulem abbreviatum terminans vel saepe axillaris, aphyllus, ebracteatus, glaberrimus, florifer foliis saepe duplo fructifer triplo—quadruplove longior. *Flores* corymbosi, pedunculis patentibus glaberrimis. *Calyx* glaber, modicè patens, deciduus : *sepala* ovalia, obtusa, concava, insertione parum inæqualia, immerse nervosa, nervis passim oblique connexis. *Petala* quatuor, aequalia, unguiculata, purpurea, rarius alba, calyce duplo longiora ; *ungues* lineares ; *laminæ* obovatæ, uninerviæ, venosæ venis apice dichotomis. *Stamina* 6, tetradynama. *Filamenta* edentula ; 4 *longiora* latiora, altero latere extra medium paulo angustiora. *Antheræ* uniformes, infra medium affixæ, oblongo ovales, ochroleucæ, basi cordata lobulis approximato-parallelis, connectivo perangusto. *Pollen* sphæricum, simplex (nec compositum quantum observare licuit per lentum 114-ies augentem). *Glandulæ hypogynæ* quatuor, filamenta longiora extus stipantes. *Ovarium* sessile, glabrum, biloculare, polyspermum, ovulis numerosis. *Stylus* brevissimus. *Stigma* bipartitum, lobis placentis oppositis, obtusis, mutuo saepius appressis, basibus confluentibus et quasi in latera styli decurrentibus. *Siliqua* racemosæ, erectæ, nonnullæ quandoque pendulæ, pedicellis patentibus, intra cicatrices floris sessiles, linear-i-oblongæ, passim siliculiformes, utrinque obtusæ. *Valvæ* planæ, uninerviæ, venosæ. *Dissepimentum* completum (rarissime fenestratum foramine magno v. parvo) arachnoideo-areolatum, axi quandoque opaciori paulo incrass-

sato, lineisve duabus opacioribus axi approximatis. *Funiculi umbilicales* marginati, latiusculi, dimidio inferiori septo cohærentes. *Semina* 6-8 in singulo loculo, saepiusque biseriata, epidermis testæ laxus, tenuissimus, albus, ultra ipsam testam in limbum latiusculum extensus, supra nucleum rugosus, testa ipsa, dempto epidermide, crasso-membranacea e duabus lamellis invicem arctè cohærentibus conflata, ^{feelxx} membrana interna nulla nisi lamella interior testæ. *Embryo* curvatus, plumbeus. *Cotyledones* ovali-ovatæ, planiusculæ, accumbentes, aveniæ. *Radicula* teres, acuta.

Obs. Parryæ altera species est *P. macrocarpa*, siliquis lanceolato-linearibus utrinque acutis inter semina saepè constrictis, antheris linearibus, pedicellis floriferis hispidiusculis, foliis incisis dentatisque; quæ Cardamine nudicaulis, Linn. sp. pl. ed. 1, p. 654, fide speciminis unici fructiferi absque floribus illius herbarii. Cardamine, &c. Gmel. sib. 3, p. 273, n. 43. Cardamine articulata, Pursh. am. 2, p. 439. De Cand. syst. 2, p. 268. Arabis nudicaulis, De Cand. syst. 2, p. 240.

EXPLICATIO TABULÆ—B.¹

PARRYA ARCTICA.—1, 2, et 3. Plantæ floridæ et 21 planta fructifera; omnes magnitudine naturali. Sequentes magnitudine auctæ, 4. flos integer, 5. petalum, 6. flos petalis orbatus, 7. sepalum, 8. genitalia integumentis floralibus avulsis, 9. stamen longius antice, 10. idem postice visum, 11. stamen brevius, 12. pollen 200-ies auctum, 13. pistillum receptaculo insidens à facie visum, 14. idem duplo auctius, 15. idem valvis avulsis, 16. ejusdem (14) sectio transversalis, 17. pistillum à latere visum, 18. idem valvis avulsis ovula exhibens loculi alterius, 19. ejusdem (17) sectio transversa, 20. placentæ portio cum ovlis et funiculis suis, 22. siliqua matura dehiscens à facie visa, 23. siliqua matura clausa à latere visa, 24. eadem valvis orbata exhibens dissepimentum et semina loculi alterius, 25. placentæ portio cum seminibus duobus epidermide laxo rugoso arilliformi tectis, 26. seminis maturi integumentis ambobus instructi

¹ See Note at p. 187.

sectio transversa, 27. semen epidermide arilliformi orbatum, 28. ejusdem sectio longitudinalis, 29. embryo situ naturali, 30. idem cotyledonibus arte expansis, 31. semen abortivum.

15. CARDAMINE BELLIDIFOLIA. *Linn. sp. pl. ed. 2, p. 913. Flor. Dan. t. 20. Wahlenb. lapp. p. 179. De Cand. syst. nat. 2, p. 249. Br. in Scoresby's arct. reg. 1, append. p. 75. (Antè, p. 181.)*

Cardamine foliis simplicibus ovatis petiolis longissimis. Linn. lapp. p. 214, n. 260 (cum figura respectu habitus bona, quoad flores pessima, tab. 9, f. 2), exclus. syn. Clusii et Gerardi, ad Arabidem bellidifoliam pertinentibus, monente D. Smith, in Flor. lapp. ed. 2.

CARYOPHYLLEÆ.

16. LYCHNIS APETALA. *Linn. sp. pl. ed. 2, p. 626. Flor. Dan. 806. Willden, sp. pl. 2, p. 810. Pers. syn. 1, p. 520. Wahlenb. lapp. p. 135, t. 7. Br. in Ross' voy. ed. 2, vol. 2, p. 192. (Antè, p. 178.) Richardson in Franklin's journ. p. 738.*

Cucubalus caule simplicissimo unifloro corolla inclusa. Linn. lapp. 143, n. 181, t. 12, f. 1.

17. CERASTIUM ALPINUM. *Linn. sp. pl. ed. 2, p. 628. [cclxxi] Willden. sp. pl. 2, p. 814. Pers. syn. 1, p. 521. Smith brit. 2, p. 500. Engl. bot. 472. Hooker scot. p. 144 et 280. Soland. in Phipps' voy. p. 202. Br. in Ross' voy. ed. 2, vol. 2, p. 192. (Antè, p. 178.) Spitz. pl. in Scoresby's arct. reg. 1, append. p. 75. (Antè, p. 181.) Hooker in Scoresby greenl. p. 413. Cerastium latifolium. Lightf. scot. 1, p. 242, t. 10.*

Obs. Species polymorpha cuius tres varietates sequentes in Insula Melville obseruatæ.

a. folia oblonga rariusve brevè ovalia, pedunculi dichotomi rarius uniflori, pili peduncularum plerique glandulosocapitati, capsulæ oblongæ calyce duplo fere longiores.

β. folia late ovata, pedunculi dichotomi pilis plerisque acutis, calycis foliola interiora glabriuscula.

γ . hirsuta, folia elliptica v. lanceolata, pedunculi divisi et solitarii, pilis plerisque acutis, capsulae calyce paulo longiores.

18. STELLARIA EDWARDSII, foliis ovato-lanceolatis integrerrimis enerviis nitidis, pedunculis terminalibus unifloris trifidisve, petalis bipartitis calyce immerse trinervi longioribus, antheris purpureis.

Obs. Duplex varietas.

In α . (cujus exemplaria plurima in Melville Island, et aliqua anno 1792, ad Chesterfield Inlet lecta vidi) folia ovata acuta v. ovato-lanceolata, pedunculi solitarii v. trifidi, lateralibus saepissime unifloris altero nunc abortiente, dum solitarii ebracteati, dum divisi bibracteati, bracteis semifoliaeis margine membranaceo ciliato, pedicellis lateralibus pariter bibracteatis. Caulis et folia saepius glaberrima, caulis nunc villosiusculus et folia basi ciliata villis tenuibus laxis.

β . (cujus exemplaria duo, quorum alterum multicaule), folia ovato-lanceolata apice subattenuata nitidissima, pedunculi saepius uniflori. Caules et folia glaberrima.

In utraque fructus desideratur, qui exstat in S. Edwardsii, *Richardson in Franklin's Journ.* p. 738. In hac vero, quae forsitan distincta species, antherae ochroleucae minimae et polline destitutae, styli elongati et stigmata manifestiora, caules et folia glaberrima, capsula erecta calyce fere duplo longior semisexvalvis, semina reniformia laevia fusca.

De *Stellaria nitida* *Hooker in Scoresby greenl.* p. 411, cui secundum auctorem folia lanceolata siccitate subtrinervia, flores subpaniculati et antherae flavae, incertus sum.

19. ARENARIA QUADRIVALVIS, foliis subulatis acutis glaberrimis trinerviis, pedunculis unifloris elongatis pubescentibus, calycibus acutissimis trinerviis petala elliptica superantibus capsula quadrivalvi (nunc 3—5-valvi) saepius brevioribus.

Alsine rubella, *Wahlenb. lapp.* 128, t. 6, forsitan non distincta; sed secundum auctorem capsula 3-valvis petala rubella et in icona subspathulata basi valde attenuata.

DESC. *Herba* 1-2-uncialis. *Radix* perennis, descendens. *Caulis* à basi ramosissimus cæspitem densum efformans,

infra vaginis petiolaribus emarcidis nervisque foliorum denudatis obsitus, supra dense foliatus. *Folia* opposita basi connata, subulata, acuta, mutica, super concaviuscula, subter convexa, trinervia, marginibus nudis. *Pedunculi* ^{clxxii} terminales solitarii, uniflori, prope basin bibracteati, *bracteis* lanceolatis, semifoliaceis margine membranaceo, pubescentes pilis brevibus, porrectis, glanduloso-capitatis, numerosis. *Calyx* 5-partitus, *sepalis* lanceoloatis, acutissimis, vix acuminatis, concaviusculis, trinerviis, viridibus nunc fusco-purpureo tinctis margine albo membranaceo, extus pilis nonnullis brevissimis minute capitatis conspersis, persistens. *Petala* 5, integerrima, alba, calyce paulo breviora, ovali-oblonga v. elliptica, integerrima, basi parum attenuata, persistentia. *Stamina* decem, margini disci brevissimi subcarnosi, dubiae originis, perigyni potius quam hypogyni, inserta. *Filamenta* subulato-filiformia, glabra. *Antheræ* ochroleucæ, subrotundæ, loculis approximatis, appositis, longitudinaliter dehiscentibus. *Ovarium* sessile, ovatum, glabrum, uniloculare, polyspermum. *Stigmata* quatuor (passim 3 et 5) filiformia, alba intus longitudinaliter hispidula. *Capsula* calyce persistenti appresso saepius paulo longior, nunc eundem subæquans, quadrivalvis, passim 3 et 5-valvis, valvis vix omnino ad basin distinctis. *Receptaculum* seminum centrale, longitudine fere capsulae, cum apice cavitatis primo connexum mox solutum. *Semina* reniformia, laevia, fusca, funiculis umbilicalibus cum receptaculo communi persistentibus.

20. ARENARIA ROSSII, glaberrima, foliis triquetro subulatis obtusiusculis muticis enerviis florem vix æquantibus, pedunculis unifloris elongatis, petalis oblongis calyces obsolete trinervios paulo superantibus.

DESC. *Herba* pusilla, glaberrima. *Caules* ramosissimi, cæspitosi, densè foliati. *Folia* opposita basibus connatis, carinata. *Pedunculi* foliis aliquoties longiores. *Calyx* 5-partitus, purpurascens; *sepala* æqualia, ovata, acutiuscula, modice concava, obsoleteissime trinervia, marginibus membranaceis nudis. *Petala* 5, angusto-oblonga, obtusa, integra, alba, calyce paululum longiora. *Stamina* 10. *Filamenta*

disco scutelliformi subcarnoso potius perigyno quam hypogyno inserta, è latiore basi filiformia, glabra, alba. *Antheræ ovales, ochroleucæ. Ovarium ovatum, sessile, uniloculare, glabrum, polyspermum. Stigmata 3, filiformia.*

Obs. *Arenaria Rossii, Richardson in Franklin's journ. p. 738,* paulo diversa est statura majore, foliis calycem longitudine superantibus, minus crassis nec adeo obtusis, internodio saepius brevioribus, calycis foliolis duobus exterioribus parum brevioribus, nervis lateralibus omnium manifestioribus, petalis longitudine calycis. In hac capsula trivalvis calycem aequat.

Alsine stricta Wahlenb. lapp. p. 127, ab *Arenaria Rossii Richards. l. c. differt* statura duplo majore, foliis longioribus acutis aliisque notis.

SAXIFRAGEÆ.

SAXIFRAGA. Linn.

CHAR. GEN. *Stamina 10, antheris didymis. Petala indivisa. Styli 2. Capsula* (v. adhærens v. libera,) *bilocularis, birostris v. biloba, foramine inter rostra ipsiusve lobis intus longitudinaliter dehiscens, polysperma. Semina: testa nucleo subconformi.*

Obs. Characterem in paucis mutatum structuram antherarum et seminum respicientem proposui ob genus [cclxxiii] maxime affine (*LEPTARRHENA* nob. quæ *Saxifraga amplexifolia, Sternb. saxifr. suppl. p. 2, t. 2. Saxifraga pyrolifolia, Don in Linn. soc. trans. 13, p. 389*) cui antheræ uniloculares bivalves septo incompleto parallelo, et semina (capsulæ altè bilobæ) scobiformia, testa utrinque ultra nucleus ovalem elongata, subulata!

21. SAXIFRAGA OPPOSITIFOLIA. Linn. sp. pl. ed. 2, p. 575. Willden. sp. pl. 2, p. 648. a. Smith Brit. 2, p. 450. Engl. bot. t. 19. Wahlenb. lapp. p. 113. Carpat. p. 118. Soland. in Phipps' voy. p. 202. Br. in Ross' voy. ed. 2, vol. 2, p. 192. (Antè, p. 177.) Spitz. pl. in Scoresby's arct. reg. 1, append. p. 75. (Antè, p. 181.) Don in Linn. soc. trans. v. 10, p. 400.

22. SAXIFRAGA HIRCULUS. *Linn. sp. pl. ed. 2, p. 576.*

β . Petala obovata, ungue nudo : caulis uniflorus.

Saxifraga propinqua. *Br. in Ross' voy. ed. 2, vol. 2, p.*

192. (*Ante, p. 177.*)

Hirculus propinquus. *Haw. Saxif. enum. p. 41.*

Obs. Petala quandoque, saepius forsan, appendiculata et calyces ciliati ; ideoque à S. Hirculo vix differt nisi petalis plerumque obovatis ungue nudo nec ciliato, caule fere semper unifloro et statura minore. Hæc varietas solum in Insula Melville observata fuit.

23. SAXIFRAGA FLAGELLARIS, flagellis filiformibus, caule erecto simplici 1-3-floro calycibusque glanduloso-pubescentibus, foliis radicalibus caulinisque inferioribus obovato-spathulatis ciliatis ; superioribus villosiusculis, petalis persistentibus capsula semisupera longioribus.

Saxifraga flagellaris. *Sternb. saxifr. p. 25 et 58, t. 6.*

Steven in Mem. soc. nat. cur. mosq. 4, p. 79. Marschall flor. taur-caucas. 3, p. 291. Br. in Ross' voy. ed. 2, vol. 2, p. 192. (Ante, p. 177.) Don in Linn. soc. trans. 13, p. 373.

Saxifraga setigera. *Pursh. am. 1, p. 312.*

DESC. *Radix* perpendicularis, fibras longas subsimplices dimittens, elevans *Caulem* unicum, simplicissimum, 2-4-unciale, foliatum, pubescentem, pilis brevibus strictis purpureo-capitatis, sursum crebrioribus, basi demum glabratum. *Folia* indivisa, radicalia et caulina inferiora confertissima, patentia, superiora sparsa : *radicalia* cuneato-obovata et subspathulata, acutiuscula, plana, basi angustata in petiolum brevem latiusculum, immerse nervosa, nervis lateralibus dichotomis ramis interioribus in extimum margini folii approximatim desinentibus, apicibus mox infra apicem folii confluentibus, ibique callo subovali in pagina superiore parum elevato aucta, marginibus longitudinaliter ciliatis, pilis subulatis strictis rigidulis brevibus albicantibus, capitulo glanduloso purpurascente demum deciduo apiculatis, terminali dilatato pariter apiculato ; *caulina inferiora* conferta, radicalibus subsimilia figura, ciliis marginalibus et paginis glabris ; *superiora* sparsa, paulo minora, oblonga, acutiuscula, basi vix attenuata, subsessilia utraque pagina margini-

busque pilis brevibus glanduloso-capitatis iisque calycis et caulis similibus. *Flagella* ex alis foliorum radicalium et inferiorum caulis solitaria, filiformia, 3—5-uncias longa, angulata v. anguste marginata, arcuato-deflexa, pilis glandulosis rarissimis conspersa, aphylla, apice sobolifera : [cclxxiv] *gemmula* parva, turbinata, è foliolis nanis numerosis con-niventibus, arcte imbricatis, obovatis acutiusculis, immersè nervosis, glabris, marginibus ciliis nonnullis brevibus ornatis ; et in ipsa basi radiculis 2—3 simplicibus singulis è vagina (coleorhiza) membranacea, primo clausa dein lacerata erumpentibus. *Flores* 1—3, pedunculati, erecti, medius præcocior, ebracteatus, laterales bractea unica nunc duabus alternis lato-linearibus sessilibus foliaceis. *Calyx* basi adhærens, dimidio libero 5-partito, laciniis ovatis, obtusiusculis extus pube glandulosa foliorum instar conspersis, intus glaberrimis, nervis alte immersis. *Petala* 5, aurea, calyce duplo longiora, *unge* brevissimo, *lamina* obovata, 5—7-nervi, sæpiissime inappendiculata, quandoque squamula obsoleta extra nervos extimos. *Stamina* decem, calyce parum longiora, petalis breviora. *Filamenta* subulata, subæqualia. *Antheræ* uniformes, cordatæ, flavæ, loculis contiguis medio (marginé) longitudinaliter dehiscentibus. *Pollen* flavum. *Ovarium* basi brevè turbinata adherenti, dimidio libero bifido ; biloculare, polyspermum. *Styli* vix ulli. *Stigmata* suborbiculata, depressa, papulosa, nec omnino glabra. *Capsula* plusquam semisupera, bilocularis, biloba, calycis laciniis erectis cincta, et petalis persistentibus (vix emarcidis) longioribus occultata, lobis brevibus crassiusculis longitudinaliter, fere ad stigmata persistentia usque, dehiscentibus. *Semina* in cavitate biloculari indivisa solum, lobis vacuis, minuta, lævia, cylindraceo-oblonga, castanea : *testa* membranacea. *Albumen* semini conforme, album, farinoso-carnosum. *Embryo* rectus, axilis, teres, longitudine fere dimidii albuminis. *Cotyledones* radicula breviores.

24. SAXIFRAGA TRICUSPIDATA. *Rottb. in act. Hafn.* 10, *p. 446, t. 6, n. 21.* *Gunn. norv.* 2, *p. 135, n. 1046.* *Flor. Dan.* 976. *Willden. sp. pl.* 2, *p. 657.* *Pers. syn.* 1, *p. 490.* *Sternb. saxifr.* *p. 54.* *Pursh. am.* 1, *p. 312.* *Giesecke*

Greenl. in Edin. Encyclop. Br. in Ross' voy. ed. 2, vol. 2, p. 192. (Antè, p. 177.) Don in Linn. soc. trans. 13, p. 440. Richardson in Franklin's jour. p. 737.

Obs. In planta Insulæ Melville, quæ statura humilior, folia radicalia passim et caulina omnia indivisa.

25. **SAXIFRAGA HYPERBOREA**, foliis glaberrimis; radicalibus palmatis elongato-petiolatis, caule lanato subbifloro, bracteis oblongo-linearibus sessilibus, petalis uninerviis, capsulis semiinferis.

Obs. Proxime accedit S. rivulari *Linn.* et ejusdem forsitan varietas. S. rivularis autem differt bracteis ambabus saepius, inferioribus semper subpetiolatis obovatis, caule inferne minus lanato. Ab utraque distincta est S. petiolaris (*Br. in Ross' voy. ed. 2, v. 2, p. 192. (Antè, p. 177)*) foliis omnibus glandulis subsessilibus conspersis: radicalibus scapum æquantibus v. superantibus, folio florali lobato, petalis trinerviis.

26. **SAXIFRAGA UNIFLORA**, foliis radicalibus aggregatis trifidis; caulinis linearibus indivisis distantibus, caule unifloro ovarioque infero viscido: pube glandulosa brevisima, calycibus obtusis, petalis obovato-oblongis.

Saxifraga cæspitosa, Br. in Ross' voy. ed. 2, vol. 2, p. 192. (Antè, p. 177.)

[*cclxxv*] *Saxifraga venosa, Haworth, enum. saxifr. p. 28?*

Obs. Nimis affinis S. cæspitosæ, *Linn.*; vix distincta species.

27. **SAXIFRAGA NIVALIS**, *Linn. sp. pl. ed. 2, p. 573. Willden. sp. pl. 2, p. 645. Pers. syn. 1, p. 488. Smith brit. 2, p. 449. Engl. bot. 440. Wahlenb. lapp. p. 113.*

a. *corymbus multiflorus thyroideus, pedunculis inferioribus trifloris.*

β. *corymbus simplicissimus pauciflorus. Linn. lapp. t. 2, f. 5.*

Obs. varietas *β.* dimidio minor, pube caulis et pedicelorum parciore breviore stricta (nec, ut in *a.* laxa decumbente lanam brevem referente); in utraque petala persistentia.

Saxifraga longiscapa, *Don in Linn. soc. transact.* 13, *p.* 388, à varietate β . vix differt nisi scapo longiore.

28. **SAXIFRAGA FOLIOLA**, foliis radicalibus cuneatis subdentatis, scapis divisis: ramis apice unifloris infra tectis foliolis nanis fasciculatis, calycibus inferis obovatis, petalorum laminis cordato-lanceolatis.

Saxifragæ stellaris var. *Linn.* *Saxifraga caule nudo simplici* foliis dentatis coma foliolosa *Linn. lapp.* *p.* 137, γ . *tab.* 2, *f.* 3.

Saxifraga stellaris β . comosa. *Willden. sp. pl.* 2, *p.* 644.

Obs. Distincta videtur à *S. stellaris*, *Linn.* (quæ in Insula Melville haud observata fuit) scapo densè foliolato floribus paucissimis (v. nullis) calycibus obovatis, et præsertim petalorum æqualium laminis basi cordatis.

29. **SAXIFRAGA CERNUA**, *Linn. sp. pl. ed.* 2, *p.* 577, *flor. lapp. n.* 172, *t.* 2, *f.* 4. *Willden. sp. pl.* 2, *p.* 652. *Pers. syn.* 1, *p.* 489. *Smith brit.* 2, *p.* 453. *Engl. bot. t.* 664. *Flor. Dan.* 22. *Wahlenb. lapp.* *p.* 116. *Hooker. scot.* *p.* 130. *Gmel. sib.* 4, *p.* 162, *n.* 74. *Sternb. saxifr.* *p.* 18, *t.* 12, *f.* 2. *Soland. in Phipps' voy.* *p.* 202. *Br. in Ross' voy. ed.* 2, *vol.* 2, *p.* 192. (*Ante, p.* 177.) *Spitz. pl. in Scoresby's arct. reg.* 1, *app. p.* 75. (*Ante, p.* 181.) *Don in Linn. soc. trans.* 13, *p.* 364. *Richardson in Franklin's journ.* *p.* 737.

Obs. Variat rarius caule ramoso, ramis unifloris, quæ *S. cernua*, *Gunn. nor. n.* 528, *t.* 8, *f.* 2, et *Saxifraga bulbifera*? *Flor. Dan.* 390. *Zoega pl. island. in Olafs. reise* 2, *p.* 236.

30. **CHRYSOSPLENIUM ALTERNIFOLIUM**, *Linn. sp. pl. ed.* 2, *p.* 569. *Willden. sp. pl.* 2, *p.* 637. *Pers. syn.* 1, *p.* 487. *Smith brit.* 2, *p.* 453. *Eng. bot. t.* 54. *Hooker scot.* *p.* 128. *Wahlenb. lapp.* *p.* 111. *Carpat* *p.* 116. *Marschall caucas.* 1, *p.* 313. *Richardson in Franklin's journ.* *p.* 737.

ROSACEÆ.

31. DRYAS INTEGRIFOLIA, foliis integerrimis passimque infra medium inciso-crenatis: venis subtus inconspicuis; novellis semisiccatisque marginibus rovolutis.

Dryas integrifolia, *Vahl in act. soc. hist. hafn. vol. 4, cclxxvi] par. 2, p. 171.* *Flor. Dan. 1216.* *Pers. syn. 2, p. 57.* *Br. in Ross' voy. ed. 2, vol. 2, p. 193.* (*Antè, p. 178.*) *Richardson in Franklin's journ. p. 740.*

Dryas tenella, *Banks' mss.* (fid. specim. à Terra Nova, ubi primum an. 1766, à D. Banks detecta) *Pursh. am. 1, p. 350.*

Obs. Nimis affinis D. octopetalæ, quæ differt statura sæpiissime majore, foliis semper longitudinaliter inciso-crenatis, subtus costatis venis prominulis.

SIEVERSIA.

SIEVERSIA, *Willden. in Mag. der gesell. naturf. fr. zu Berlin 5. jahrg. (1811), p. 397,* charactere emendato.

CHAR. GEN. *Calyx decemfidus, laciniis alternis accessoriis. Petala 5. Stamina indefinite numerosa. Ovaria indefinita, ovulo adscendente. Styli terminales, continuo. Achenium stylo toto persistenti aristatum. Embryo erectus.*

Habitus fere, nec omnino, Gei, quod differt Stylis geniculatis articulo superiore dissimili sæpiusque deciduo.

Ab utroque genere distinguendum Geum potentilloides (*Coluria nob.*) ob Stylum basi cum apice ovarii articulatum deciduum, et Achenia (*glandulosa*) tubo elongato turbinato calycis inclusa.

Sieversiae species sunt Geum montanum et reptans *Linn.* radiatum *Michaux*, Peckii et triflorum *Pursh*, glaciale *Adams*, humilis, congesta et dilatata *nob.* et Geum anemoides *Willden. sp. pl.* quæ Dryas pentapetala *Linn.* cui certè styli terminales nec laterales ut perhibet Willdenow in charactere generis Sieversiae, pro hac specie solum ab illo instituti.

32. SIEVERSIA ROSSI, aristis nudis, foliis radicalibus interruptè pinnatis glabris: pinnis trilobis; accessoriis imisque nanis indivisis, caule unifloro subdiphylo, petalorum venis omnibus distinctis.

DESC. *Herba* perennis, 2—6-uncialis, glabra. *Caudex* demersus, radiciformis, squamis scariosis fuscis (petiolorum reliquiis) tectus, infra medietatem fibras descendentes simplices fibrillosas crassiusculas proferens. *Folia radicalia* numerosa (4—7,) glabriuscula, petiolata, interrupte pinnata, exstipulata, pinnis circumscriptione ovatis cuneatisve, trifidis vel bifidis (lobo superiore lateralium deficiente) basi inæquali, inferne in rachin decurrenti, superioribus approximatis, nanis indivisis interpositis inter medias; imis ipsis minimis integerrimis. *Petioli* infra medium dilatati ibique scariosi, pallide fusi. *Scapi* ex alis foliorum radicalium vel squamarum superiorum caudicis demersi, infra nudi, extra medium foliis saepius duobus, alternis, sessilibus, pinnatifidis, exstipulatis, in statu florescentiae (cum scapi folia radicalia vix æquant) invicem apicique scapi approximatis, in fructiferis folia radicalia aliquoties superantibus, ab invicem at ab apice saeppe distantibus; teretes, pubescentes, pube descendendo sensim parciore. *Flos* solitarius, erectus, ebracteatus. *Calyx* extus pubescens, decemfidus, tubo brevi turbinato, lacinis 5 majoribus interioribus, late semiovatis, acutiusculis, quinque alternis dimidio minoribus, ovalibus, petalis oppositis. *Petala* 5, obovata, integerrima, venosa, aurea, sinibus laciniarum majorum calycis inserta [cclxxvii] iisque sesquilonjora. *Stamina* fauci calycis inserta, indefinita, 30 plura. *Filamenta* subulata, glabra. *Antheræ* ovatae, flavæ, basi semibifidæ, loculis parallelo-approximatis, longitudinaliter dehiscentibus. *Pollen* globosum, simplex. *Ovaria* indefinite numerosa, receptaculo subcylindraceo imbricato inserta, breve pedicellata, ab apice pedicellorum solubilia, hirsuta, pilis acutis strictis, monosperma, ovulo adscendente. *Styli* terminales, filiformes, subulati, glabri, stricti. *Stigmata* dilatata, obliqua, retusa, papulosa.

Obs. This species is named in honour of Lieutenant James Ross, in whose well-preserved herbarium several plants were found not contained in the other collections.

EXPLICATIO TAB. C.¹

SIEVERSIA ROSSI. 1, 2. Planta florida, magnitudine naturali. Sequentes auctæ. 3 et 4. flos antice et postice visus. 5. flos petalis et staminibus orbatus. 6. petalum. 7. portio calycis cum staminibus respondentibus ejusdem basi insertis. 8, 9. stamen antice et postice visum. 10. pollen 200-ies auctum. 11. pistillum. 12. id. longitudinaliter sectum. 13. pistilla receptaculo insidentia. 14. receptaculum commune pistillorum cum pedicellis. 15. achenium fere maturum. 16. id. longitudinaliter sectum. 17. id. transverse sectum. 18. semen. 19. embryo.

33. POTENTILLA PULCHELLA, foliis pinnatis bijugis super villosis subter sericeis, foliolis pinnatifidis pari inferiori minore: lobis omnium lanceolato-linearibus, caulis pauci-floris (unifloris), stylo basi glanduloso-dilatata.

Potentilla pulchella, *Br. in Ross' voy. ed. 2, vol. 2, p. 193. (Ante, p. 178.)*

Potentilla sericea? *Greville in Mem. Wern. soc. 3, p. 430; fide speciminis in herb. groenlandico D. Jameson.*

Obs. P. sericea *Linn.* facile distinguitur foliis 3—5-jugis, et lana elongata receptaculi, quod in P. pulchella pube brevi ovaria vix æquante instructum. Nostra planta affinitate proprius accedit P. niveæ, haud obstante hujus divisione ternata foliorum, quæ nunc, rarissime quamvis, addito foliorum pari nano similiter pinnata evadunt.

34. POTENTILLA NIVEA. *Linn. sp. pl. ed. 2, p. 715. Rottb. in act. Hafn. 10, p. 451, t. 7, n. 22, optima fig. var. a. Willden. sp. pl. 2, p. 1109. Pers. syn. 2, p. 56. Wahlenb. lapp. p. 146. Nestler potent. p. 73. Lehman potent. p. 184.*

a. folia super villosiuscula viridia, subter niveo-tomentosa.

β. folia utrinque villosiuscula, paginis concoloribus.

¹ See Note at p. 187.

- Potentilla nivea β , *Wahlenb. lapp.* p. 147.
 Potentilla Groenlandica, *Br. in Ross' voy. ed. 2, vol. 2,*
p. 193. (Antè, p. 178.)
 Potentilla frigida? *Greville in Mem. Wern. soc. 3, p.*
430, sec. exempl. in herbario D. Jameson.

Potentilla verna, *Hooker in Scoresby's greenl.* p. 413.
Obs. Polymorpha species, cui nimis affinis est [ccclxxviii]
 Potentilla Vahliana *Lehm. potent.* p. 172, quæ P. hirsuta
Flor. Dan. t. 1390, secundum exemplar Groenlandicum à
 D. Giesecke; et P. Jamesoniana *Greville in Mem. Wern. soc.*
3, p. 417, t. 20, fide exempl. à D. Jameson; nec diversa
 videtur P. macrantha *Ledeb.* secundum specimen ex Oona-
 laska à D. Fischer.

PAPILIONACEÆ.

35. ASTRAGALUS ALPINUS, *Linn. sp. pl. ed. 2, p. 1070.*
Flor. lapp. p. 218, n. 267, t. 9, f. 1. Flor. Dan. 51. Gmel.
sib. 4, p. 45, n. 59. Pall. astrag. p. 41, t. 32. Willden.
sp. pl. 3, p. 1297. Wahlenb. lapp. p. 190, t. 12, f. 5
(fruct.) Helv. 131. Carpat. 223. Pursh. am. 2, p. 472.

Phaca astragalina, *De Cand. Astrag. p. 52. Pers. syn.*
2, p. 331. Richardson in Franklin's journ. p. 745.

36. OXYTROPIS ARCTICA, subacaulis sericea, stipulis
 petiolaribus, foliolis oppositis alternisque ovali-oblongis,
 capitulo subumbellato paucifloro, leguminibus erectis oblon-
 gis acuminatis calycibusque nigro-pubescentibus.

DESC. *Radix* lignea, perpendicularis, longissima, crassa,
 subramosa, multiceps. *Caules* brevissimi, dense foliati et
 basi stipulis villosissimis persistentibus imbricatis tecti.
Folia conferta, foliola 11—17, novella utrinque villosa
 sericea, adulta super glabriuscula, ovalia v. oblonga,
 sæpius obtusa raro acutiuscula. *Stipulæ* membranaceæ,
 infra petiolo adnatæ, apicibus solutis semilanceolatis, acu-
 tissimis. *Scapi* foliis longiores, teretes, villosi, villis albo-
 cinereis, nunc cinereis nigrisque intermixtis, nunc om-
 nino nigris. *Flores* majusculi. *Capitulum* 3—5-florum,
 pedicellis brevissimis. *Bracteæ* lineares, acutæ, patulæ,

calyce breviores, extus pube nigricante. *Calyx* villis nigris subadpressis copiosis tectus, dentibus erectis brevibus. *Corolla* cæruleo-violacea, calyce duplo longior (9—10-lin. æquans). *Vexillum* obcordatum lateribus reflexis, lamina basi attenuata absque callis auriculisve. *Alæ* vexillo breviores, obtusissimæ, apice dilatato oblique retuso, prope basin lateris auriculati intus plica saliente, hinc auriculo mediocri. *Carina* alis paulo brevior, obtusa cum mucrone brevi acutiusculo. *Stamina* inclusa 1—9-fid. antheris uniformibus. *Legumen* erectum, calyce hinc longitudinaliter fisso infra auctum, oblongum, acuminatum, sutura superiore intrusa intusque septifera, septo incompleto bipartibili, funiculis adnatis parallelo-striato. *Semina* reniformia, in singulo loculo 7—9, funiculis apice solutis è margine dissepimenti quasi ortis.

Obs. Species proxima O. uralensi quæ diversa floribus leguminibusque spicatis, foliolis numerosioribus et semper acutissimis, calycibus leguminibusque cinereis pilis nonnullis atris pluribus albis.

COMPOSITÆ.

37. LEONTODON PALUSTRE, *Smith brit.* 2, p. 823. *Engl. bot.* 553. *Pers. syn.* 2, p. 367. *Hooker scot.* p. 227. *Flor. Dan.* 1708. *Richardson in Franklin's journ.* p. 746. [cclxxix] Leontodon lividus, *Waldst. et. Kitaib.* *pl. rar. hung.* 2, p. 120, *t.* 115. *Willden. sp. pl.* 3, p. 1545. *Marsch. taur-caucas.* 2, p. 246, *vol.* 3, p. 531.

Leontodon taraxacum? *Br. in Ross' voy. ed.* 2, *vol.* 2, p. 194. (*Antè*, p. 178.)

Leontodon taraxacum β , *Wahlenb. carpat.* 238. *Upsal.* p. 257.

Obs. Nimis affinis L. Taraxaco L. videtur.

38. ARNICA MONTANA β , *Linn. sp. pl. ed.* 2, p. 1245. *Willden. sp. pl.* 3, p. 2106. *Pers. syn.* 2, p. 453. *Wahlenb. lapp.* 210.

Arnica angustifolia, *Vahl in Flor. Dan.* 1524, fide exempl. Groenland. à D. Giesecke.

Doronicum foliis lanceolatis, *Linn. lapp.* 241, *n.* 305.

Obs. Planta nostra Groenlandicâ sæpius humilior (2—4-uncialis) cum exemplaribus nonnullis à D. Richardson prope littora maris arctici quadrans vix specie distinguenda ab *Arnica montana* *a*, cuius insuper varietates sunt *Arnica plantaginea* et *fulgens*, *Pursh. am.*

39. *CINERARIA CONGESTA*, capitulo lanato, foliis linearilingulatis undulatis, caule simplicissimo.

DESC. *Herba* 3—4-uncialis lanata. *Radix* fasciculato-fibrösa. *Folia* radicalia et ima caulinæ numerosa indivisa, lingulata, obtusa, undulata, denum glabriuscula, viridia; caulinæ superiora 2—3, alterna, lana decumbente. *Caulis* erectus, simplicissimus, lana implexa tardius decidua tectus. *Anthodia* in capitulum terminale subsphæricum ebracteatum dense congesta, lana copiosa semi-involuta, radiata. *Involucrum* (*calyx communis*) simplici serie polyphyllum, lana decumbenti copiosa, è villis longis implexis articulatis, dense tectum. *Ligulæ* numerosæ, femineæ, lamina oblongo-lineari, integra, 2—3-nervi. *Flosculi* hermaphroditi perfecti. *Tubus* gracilis. *Limbus* infundibuliformis semiquinquefidus, decemnervis, laciñiis semilanceolatis trimeriis nervis axilibus tenuioribus. *Antheræ* semi-exsertæ basibus muticis, appendicibus apicis linearibus acutis. *Ovaria* glabra, subcylindracea. *Stigmata* intus canaliculata apice subtruncata. *Pappus* sessilis, filiformis, albus, radiis numerosis longitudinaliter denticulatis.

Obs. Distincta species videtur, attamen non longe distat à *C. palustri* statura et inflorescentia insigniter variabili.

40. *TUSSILAGO CORYMBOSA*, corymbo femineo laxo pauci-floro: corollulis ligularibus nervosis; masculo congesto, foliis cordatis sinuatis inæqualiter dentatis subtus tomentosis.

DESC. *Radix* repens. *Folia* radicalia longius petiolata, cordata, nunc sagittato-cordata, sinuata, sæpius ad $\frac{1}{3}$ nunc ad $\frac{1}{2}$ fere radii, lobis inæqualiter dentatis, dentibus mucronulo eglanduloso terminatis, adulta super glabra cum tomento aliquo in nervis venisque primariis, subter lana

brevi alba implexa, diametro sesquiunciali usque $2\frac{1}{2}$ uncias æquanti. *Scapi* 4—8-unciales, adulti tomento parco obsiti, bracteis (petiolis dilatatis) amplexicaulibus, saepius foliolo nano dentato terminatis. *Anthodia* polygamo-dioica. MAS. *Corymbus* coarctatus pauciflorus: *anthodiis* radiatis: *ligulis* femineis, lamina oblonga: *flosculis* hermaphrodito-masculis, [cclxxx] infundibuliformibus, stigmatibus hispidis, incrassatis, exsertis. FEM. *Corymbus* simplex, 5—8-florus: *pedunculi* involucre longiores, bracteis nonnullis linearibus acuminatis pilis articulatis pubescentes. *Involucrum* (calyx communis) simplici serie polyphyllum, foliolis acutis, extus pubescentibus, pilis articulatis brevibus. *Corollulae* omnes ligulatae, femineæ, præter 2—3 centrales, hermaphrodito-masculas. *Femineæ* involucre longiores, ligula 2—3-nervi indivisæ, stigmatibus patulis, stylis extra tubum hispidulis.

Obs. Proxima species T. frigidæ, quæ differt præsertim thyrso femineo multifloro congesto demum fastigiato, masculo laxiore, foliis minus altè sinuatis.

41. ANTENNARIA ALPINA, Br. in *Linn. soc. transact.* 12, p. 123.

Gnaphalium alpinum. *Linn. sp. pl. ed. 2, p. 1199, lapp. n. 301.* *Willden. sp. pl. 3, p. 1883.* *Pers. syn. 2, p. 421.* *Wahlenb. lapp. 202, Helv. p. 149.* *Carpat. in obs. ad. p. 258.* *Pursh. am. 2, p. 525.* *Richardson in Franklin's journ. p. 747.*

Obs. Planta feminea tantum in Melville Island lecta; mascula à nobis nondum visa (nisi hujus forsitan varietas pusilla ab Oonalaska), et nullibi, quantum scio, observata!

CAMPANULACEÆ.

42. CAMPANULA UNIFLORA, *Linn. sp. pl. ed. 2, p. 231, flor. lapp. n. 85, t. 9, f. 5, 6.* *Rottb. in act. hafn. 10, p. 432, t. 6, n. 19.* *Willden. sp. pl. 1, p. 890.* *Pers. syn. 1, p. 188.* *Wahlenb. lapp. p. 63.* *Flor. Dan. 1512.* *Svensk bot. 526.* *Richardson in Franklin's journ. p. 733.*

ERICINÆ.

43. ANDROMEDA TETRAGONA, *Linn. sp. pl. ed. 2, p. 563,*
lapp. n. 166, t. 1, f. 4. *Willden. sp. pl. 2, p. 607.* *Pers.*
syn. 1, p. 480. *Flor. Dan. 1030.* *Pall. ross. 2, p. 56, t.*
73, f. 4. *Wahlenb. lapp. p. 200.* *Br. spitzb. pl. in Scoresby's*
arct. reg. 1, append. p. 75. (*Antè, p. 181.*) *Ross' voy.*
ed. 2, v. 2, p. 192. (*Antè, p. 177.*) *Richardson in Franklin's journ. p. 737.*

SCROPHULARINÆ.

44. PEDICULARIS ARCTICA, caule simplici lanato, foliis
 pinnatifidis lobis sub-ovatis dentato-incisis : adultis glabris ;
 caulinis petiolo dilatato, calycibus quinquefidis lanatis, galea
 obtusa truncata bidentata, filamentis longioribus hirsutis.

DESC. *Radix* fasciculata, fibris crassis carnosus. *Caulis*
 simplex, foliatus, 2-3-uncialis, lana alba implexa tardius nec
 omnino decidua. *Folia* circumscriptione linearia, pinnati-
 fida ; lobis saepius approximatis, dentatis, primò lanata,
 adulta glabriuscula ; *petioli* omnium, radicalium præcipue,
 lanati. *Spica* multiflora, densa, florida sesquiuncialis, fruc-
 tifera 2-3-uncialis : *bracteæ* foliaceæ, pinnatifidæ. *Calyx*
 lanatus, lana copiosa, alba, implexa, persistenti, semiquin-
 quefidus, laciinis inæqualibus, semilanceolatis, inte- [ccclxxxi]
 gerrimis, vel obsoletissime dentatis. *Corolla* purpurea,
 glaberrima : *galea* leviter falcata, obtusa, antice apice
 oblique truncata et ad truncaturæ basin utrinque dente
 unico acuto brevi quandoque brevissimo. *Stamina* inclusa :
Filamenta duo longiora extra medium hirsuta, duo breviora
 longitudinaliter glabra : *Antheræ* uniformes, imberbes, basi
 bifidæ. *Stigma* subcapitatum, saepius exsertum. *Capsula*
 calyce persistenti duplo longior, ovata, acuminata, inæquili-
 tera, margine inferiore rectiusculo superiore modice
 arcuato, bilocularis, bivalvis, valvis medio septigeris, septi
 dimidio inferiori placentifero. *Semina* oblonga, teretus-

cula, altero latere margine perangusto aucta, utraque extremitate areola nigricanti notata.

Obs. Species proxima *P. sudeticæ Willden. sp. pl. 3, p. 209*, quæ differt statu majore, caule glabro, foliorum lobis linearibus inciso-pinnatifidis; caulinis petiolo haud dilatato, corollæ labio inferiore manifestè dentato. *P. sudetica Richardson in Franklin's jour. p. 742*, à sudetica vera vix diversa est nisi corollæ labio superiore breviore, denticulo longiore, caule subunifolio, nec species distincta videtur.

POLYGONEÆ.

45. *POLYGONUM VIVIPARUM*, *Linn. sp. pl. ed. 2. p. 516, fl. lapp. n. 152. Gmel. sib. 2, p. 44, n. 34, t. 7, f. 2. Willden. sp. pl. 2, p. 441. Pers. syn. 1, p. 439. Smith brit. 1, p. 428. Engl. bot. 669. Fl. Lond. new ser. 1, t. 81. Wahlenb. lapp. 99. Flor. Dan. 13. Svensk. bot. 336. Marsch. taur-caucas. 1, p. 301. Pursh. am. 1, p. 271. Giesecke Greenl. in Edin. encyclop. Hooker in Scoresby's greenl. p. 410. Richardson in Franklin's journ. p. 737.*

Natter Wurtz, *Marten's Spitzb. lib. 3, cap. 7, t. I, a.*

OXYRIA.

OXYRIA, *Hill, veg. syst. 10, p. 24* (genus omnino artificiale, *Hill l. c.*). *De Cand. fl. franc. 3, p. 379* (Rumicis subgenus). *Br. in Ross' voy. ed. 2, vol. 2, p. 192* (*Ante*, p. 177) (genus distinctum). *Campdera rumex*, *p. 153. Hooker Scot. p. 99.*

CHAR. GEN. *Perianthium tetraphyllum* (duplici serie). *Stamina 6. Styli 2. Stigmata penicillata. Achenium lenticulare, membranaceum, utrinque alatum, perianthio infra cinctum. Embryo centralis.*

Obs. Genus proprius accedens *Rheo* quam *Rumici*, ab utroque satis distinctum.

A *Rheo* differt numero binario perianthii et stylorum,

stigmatibus penicillatis (quæ in *Rheo capitata* sublobata), et textura achenii: convenit numero proportionali et situ staminum (quæ geminatim nempe foliolis exterioribus et solitarie interioribus perianthii opposita) pericarpio semi-denudato alato, et embryone centrali.

Rumex ab *Oxyria* diversus est numero ternario omnium partium floris, situ staminum, quæ sex tantum et geminatim foliolis exterioribus perianthii opposita, fructu nucamentaceo aptero, foliolis interioribus mutatis perianthii tecto, embryone laterali: convenit fere stigmatum divisione.

Ovuli insertionem et Radiculæ embryonis situm inter notas genericas haud introduxi: Semen enim erectum [ccclxxxii] cum Embryone inverso uti character totius ordinis (incluso certe *Calligono* contra assertionem *Campderæ* l. c.) eundem à *Chenopodeis* optime distinguens in *prodr. flor. nov. holl.* p. 419, primus proposui. Inter ordines apetalos similem structuram seminis in *Urticeis* et *Piperaceis*, aliis notis distinguendis, obtinet: dum Embryo inversus cum ovulo pendulo characterem essentialē **CHLORANTHEARUM** (*Br. in Bot. magaz.* 2190, *nov. 1820*) efformat.

46. *OXYRIA RENIFORMIS*, *Hooker scot.* p. 111. *Scoresby's greenl.* p. 410. *Oxyria digyna*, *Campd. rumex*, p. 155.

Rheum digynum. *Wahlenb. lapp.* 101, *tab. 9, fructus.* *Helv.* p. 74, *Carpat.* 114.

Rumex digynus, *Linn. sp. pl. ed. 2*, p. 480, *fl. lapp. n.* 132, *obs. 3.* *Willden. sp. pl. 2*, p. 258. *Pers. syn. 1*, p. 395. *Smith brit. 1*, p. 395. *Eng. bot. 910.* *Flor. Dan.* 14.

47. *SALIX ARCTICA*, ovariis subsessilibus tomentosis, stigmate quadrifido stylum subæquante, squamis orbiculato-ovatis, foliis integerrimis ovalibus obovatissive: adultis super glabris subter villosiusculis.

Salix arctica, *Br. in Ross' voy. ed. 2, v. 2*, p. 194. (*Antè*, p. 178.) *Richardson in Franklin's journ.* p. 752.

Salix n. 37. *Hooker in Scoresby's greenl.* p. 414*, secundum specim. à D. Scoresby.

Salix, *Greville in Mem. Wern. soc. 3*, p. 432, fide specim. in herb. grœnl. D. Jameson.

DESC. *Frutex* depressus; *radice* lignea crassa longa. *Rami* decumbentes, floriferi omnes et steriliuni nonnulli adscendentibus, adulti glabri. *Folia* sparsa, petiolata, elliptico-obovata, v. obovata, integerrima, obtusa, quandoque retusa, novella super glabra, subter villis longis laxis decumbentibus, adulta utrinque glabra, venis subter paulo eminentibus venulis anastomozantibus. *Amenta* utriusque sexus ramos breves villosos foliatos terminantes. *Squamæ* orbiculato-obovatæ sœpe retusæ, fusco-nigricantes, villosæ. *Masc.* 8-10-lin. longa, densa. *Stamina* 2-3, forsitan sæpius 3, filamentis distinctis. *Squamulæ* (Nect.) duæ, interiore paulo majore, utraque apice incrassato. *Fem.* *Squamula* unica, interior. *Ovarium* brevissime pedicellatum, pedicello diametrum transversum capsulæ vix æquante, dense tomentosum, cinereum. *Style* longitudine varians nunc stigmata æquans, nunc fere dimidio brevior.

MONOCOTYLEDONES.

JUNCEÆ.

48. *JUNCUS BIGLUMIS*. *Linn.* *sp. pl. ed. 2*, *p. 467*.
Montin in *Amæn. acad. 2*, *p. 266*, *t. 3, f. 3*. *Flor. Dan.* 120. *Zoëg. pl. island. in Olafs. reise 2*, *p. 235*. *Vahl* in *act. soc. hist. nat. hafn. 2, par. 1*, *p. 38*. *Willden. sp. pl. 2*, *p. 216*. *Pers. syn. 1*, *p. 385*. *Smith brit. 1*, *p. 382*. *Engl. bot. 898*. *Bicheno* in *Linn. soc. transact. 12*, *p. 320*. *Hooker scot. p. 106*.

[cclxxxiii] 49. *LUZULA HYPERBOREA*, spicis multifloris subumbellatis pedunculatis sessilibusque (nunc omnibus sessilibus), bractea umbellæ folacea; partialibus omnibus fimbriatis, capsulis obtusis perianthia acuta subæquantibus, caruncula basilari seminis obsoleta, foliis planis.

Luzula campestris, *Br. spitzb. pl. in Scoresby's arct. reg.*
1, *append. p. 75.* (*Antè, p. 181.*)

Juncus arcuatus, *Hooker in Scoresby's greenl. p. 410,*
secund. exempl. à D. Scoresby.

Juncus campestris, *Soland. in Phipps' voy. p. 201*, fide
exempl. in Herb. Banks.

Obs. Vix distincta species, et potius ad *L. campestrum* mire variantem, quam ad *L. arcuatam* referenda; præsertim ob bracteam umbellæ sæpiissime, non vero semper, foliaceam, et folia plana. *L. arcuatæ* β. (*Wahlenb. lapp. p. 88, cuius fig. in Flor. Dan. 1386*, sed exel. syn. Villars), tamen accedit, inflorescentia, spicis multifloris, longius pedunculatis, quandoque etiam arcuato-recurvis, bractea umbellæ nunc, rarissime quamvis, squamacea, partialibus omnibus fimbriatis, et carunctula seminis obsoleta. Hæc autem forsitan distincta à *L. arcuata* α, *Wahlenb. lapp. p. 87, t. 4. Hooker flor. lond. n. ser. t. 151*, cui spicæ longius pedunculatae paucifloræ, et semina ni fallor absque carunctula.

In *Luzulis* omnibus, quas examini subjeci, excepta *L. pilosa*, observavi funiculum umbilicalem è filis spiralibus (decompositione partiali funiculi denudatis?) compositum.

CYPERACEÆ.

50. *CAREX MISANDRA*, spicis (4—6) pedunculatis ovalibus pendulis: terminali basi mascula; reliquis feminineis, fructibus lanceolatis acuminatis bidentatis margine denticulatis squama ovali longioribus, stigmatibus 2-3.

DESC. (exemplarium quatuor incompletorum cum spicis fructiferis et portione culni, in herbario D. Ross). *Folium supremum* breve, lineare, marginibus longitudinaliter denticulatis. *Spicæ* v. *umbellatæ*, v. *alternæ*, fructiferæ ovales v. *oblongæ* pendulæ, pedunculis viridibus, laxis, angulatis, spica longioribus. *Bractea* umbellæ communis vaginans, basi atro-fusca, supra viridis, in folium breve subulato-lineare, planum, marginibus denticulato-asperis producta, includens nonnullas partiales, quarum ima communi sub-similis, foliolo breviore terminata, nunc exserta. *Squamæ*

ovales, obtusiusculæ, læves, glabræ, nigro-fuscæ, apice limbo angusto albo. *Fructus* circumscriptione lanceolatus, acuminatus, basi attenuata, fusco-ater, ore ipso albicanti emarginato, marginibus acuminis et dimidii superioris denticulatis, cæterum lævis. *Achenium* intra cupulam brevè pedicellatum, obovatum, ventre plano, dorso dum stigmata duo modice convexo dum tria angulato.

Obs. Nimis affinis C. fuliginosæ *Sternb.* et *Hoppe* in *act. soc. bot. Ratisb.* 1, p. 159, t. 3, vix distincta species.

51. CAREX CONCOLOR, spicis sexu distinctis: mascula unica; femineis 2-3 erectis subsessilibus, squamis omnibus obtusis axi subconcolori, bracteis basi auriculatis, capsulis lævibus ovalibus mucronulo brevissimo integerrimo, stigmatibus 2, culmis lævibus.

[*cclxxxiv*] *Obs.* C. cæspitosæ proxima et vix differt nisi statura minori (3-4 unciali) squamis (nigro-spadiceis) axi sæpius marginibus semper concoloribus, foliis utrinque viridibus et culmis lævibus. An revera distincta species?

52. ERIOPHORUM CAPITATUM, *Host* *gram. austr.* 1, p. 30, t. 38. *Schrad. germ.* 1, p. 151. *Wahlenb. lapp.* p. 18. *Smith comp. ed.* 2, p. 11. *Engl. bot.* 2387. *Hooker scot.* p. 20.

53. ERIOPHORUM ANGUSTIFOLIUM, *Willden. sp. pl.* 1, p. 313. *Smith brit.* 1, p. 59. *Engl. bot.* 564. *Schrad. germ.* 1, p. 153. *Hooker scot.* p. 21.

Eriophorum polystachion, *Wahlenb. lapp.* p. 18.

Obs. Plantæ nostræ, quasi mediae inter E. angustifolium et polystachyon forsan ab utroque distinctæ, duæ varietates adsunt.

α , pedunculis lævibus.

β , pedunculis scabris, denticulis crebris minutis.

Hæc ab E. gracile, *Roth catalect.* 2, *add.* et *Wahlenb. lapp.* p. 19, fid. exempl. ab ipsis auctoribus in *Herb. Banks.*, certe diversa, statura humiliori, foliis latioribus, squamis enerviis omnino nigricantibus, et acheniis oblongo-obovatis.

GRAMINEÆ.

54. ALOPECURUS ALPINUS, spica ovata, arista perianthii glumam sericeam lateribus villosissimis subæquante, vagina suprema ventricosa folio suo plano lanceolato triplo longiore.

Alopecurus alpinus, *Smith brit.* 3, p. 1386. *Engl. bot.* 1126. *Hooker scot.* p. 22. *Roem. et Schul. syst.* 2, p. 272. *Br. in Ross' voy.* ed. 2, v. 2, p. 191. (*Antè*, p. 177.) *Hooker in Scoresby's greenl.* 410. *Richardson in Franklin's journ.* p. 731.

Alopecurus ovatus, *Knapp gram. brit.* 15. *Hornem. in Flor. Dan.* 1565.

Alopecurus antarcticus, *Giesecke greenl. in Brewster's edin. encyclop.*

Obs. Species (quam primus in Scotiæ monte Loch ny Gaar anno 1794 legi) variat culmo, qui saepius adscendens, erecto, spica oblongo-cylindracea, arista nunc gluma duplo longiore, rarius nulla.

A. antarcticus, *Vahl symb.* 2, p. 18. *Willden. sp. pl.* 1, p. 357, ab. *A. alpino* differt spica saepius cylindracea, arista glumam bis superante, folio supremo linearis apice attenuato vaginam suam superante v. æquante.

A. pratensis L. distinguitur spica cylindracea, glumis acutis latere tantum villosiusculis, arista glumis duplo longiore, vagina suprema laxiusculè cylindracea folium suum lineare multoties superante.

PHIPPSIA.

[cclxxxv]

Phippsia (subgenus *Vilfæ*) *Trinius in Spreng. neue entdeck.* 2, p. 37.

CHAR. GEN. *Gluma uniflora*, abbreviata, inæquivalvis. *Perianthium muticum*, obtusum, imberbe; *valvula superiore* nervis sursum divergentibus. *Lodiculæ* 2. *Stam.* 1-3. *Stigmata* 2, sessilia. *Caryopsis libera*, teres, exsulca.

Gramen pusillum, *aquaticum* v. *in inundatis nascentis*. *Culmi basi divisi*. *Folia plana*; *vagina integra*, *ipso apice*

tantum fisco. *Panicula coarctata, ramis semiverticillatis.* *Glumæ enerves, inferiore minori.* *Stamina 1-3.* *Stigmata persistentia.*

Obs. E graminibus unifloris proxime accedit Vilfæ et Colpodio, affinitatem habet etiam quandam cum Schmidtia Trattin. (*Coleanthus Roem. et. Sch. syst. 2, p. 11*), cui certe gluma nulla, et perianthium bivalve, probante valvula superiore dinervi.

Inter genera locustis bifloris Phippsia affinis est Catabrosæ, conveniens glumis abbreviatis, perianthiis obtusis concavis et foliorum vaginis apice tantum fisco: differt locustis unifloris, caryopside tereti, nec lateraliter compressa.

55. PHIPPSIA ALGIDA.

Agrostis algida, *Soland. in Phipps' voy. p. 200*, cum descriptione accurata. *Wahlenb. lapp. p. 25, t. 1*, ubi perianthium pro gluma, omnino prætervisa, depictum, et lodicula, perperam indivisa et aucta, pro perianthio univalvi. *Flor. Dan. 1505*, structuram eandem exhibens ac in Wahlenb. l. c. *Br. in Ross' voy. ed. 2, v. 2, p. 191* (Gramen sui generis.) (*Antè, p. 177.*)

Trichodium algidum, *Svensk bot. 545, f. 2*, ab ic. Wahlenb. mutuata. *Roem. et. Sch. syst. 2, p. 283.*

Desc. *Gramen* biunciale, glaberrimum, caespitosum. *Culmi* ipsa basi divisi ibique vaginis scariosis tecti. *Folia* linearia, obtusiuscula, laevia: *ligula* brevis, obtusissima, indivisa: *vagina* laxiuscula, integra, ipso apice tantum fisco. *Panicula* coarctata, ramis semiverticillatis, paucifloris, laevibus. *Locustæ unifloræ.* *Gluma* nana, bivalvis, inæqualis, valvulae muticæ, obtusiusculæ, concavæ, haud carinatæ, integræ, membranaceæ; *inferior* minor, enervis; *superior* plus duplo major, ipso perianthio triplo circiter brevior, obsolete uninervis; ambæ sæpiissime post lapsum perianthii cum rachide persistentes, inferiore quandoque decidua. *Perianthium* intra glumam brevissime pedicellatum: *valvula* *inferior* concava, ovato-lanceolata, trinervis, nervorum dimidio inferiore hispidulo; *superior* ejusdem fere longitudinis

et latitudinis sed diversæ figuræ, obtusa, 3-4-dentata, dinervis, nervis hispidulis à basi sursum paulo divergentibus, ipsa basi sub-approximatis. *Lodiculæ* 2, subovatæ, membranaceæ, indivisæ, glabræ. *Stamina* 1-3. *Stigmata* 2, sessilia, longa, hyalina, ramulis simplicibus. *Caryopsis* ovali-oblonga, teres, exsulca, stigmatibus emarcidis diu coronata. *Embryo* caryopside quadruplo brevior.

Obs. Hæc è speciminibus à Melville Island; species [ccclxxvi] autem variat perianthii nervis lævibus, staminibus 2, et quandoque unico, nervo alteri valvulæ superioris perianthii opposito.

In Terra Tschutski à Dav. Nelson, in tertio it. Cook, lecta fuit varietas (?) insignis, duplo major, culmis ramosis foliis laxioribus aliisque notis diversa: vix species distincta.

COLPODIUM.

Colpodium. *Trin. agrost. p. 119, f. 7.* Subgenus Vilfæ *Trin. in Spreng. neue entdeck. 2, p. 37.*

CHAR. GEN. *Gluma* uniflora, subæquivalvis, mutica. *Perianthium* gluma longius, submuticum, obtusum, apice scarioso; *valvulis* subæqualibus, integerrimis, *superiore* exserta, dinervi, lateribus parallelis. *Lodiculæ* 2. *Styli* 2. *Stigmata* plumosa. *Caryopsis.* - - - -

Gramen glabrum. Culmi erecti v. adscendentes. Folia *plana*, ligula *indivisa imberbi folio latiore*, vagina *longitudinaliter fissa*. Panicula *coarctata*, ramis *semiverticillatis*. Locustæ *oblongæ*, *glabriusculæ* cum v. *absque rudimento*, sæpius *setuliformi*, *flosculi secundi*.

Obs. Gramen hocce habitu fere peculiari, primo intuitu Poæ proprius accedit quam Agrostidi s. Vilfæ, relationem quodanmodo etiam cum Dupontia et Deschampsia habere videtur. Caryopside ignota autem genus haud stabilitum, et de ejusdem affinitate cum Colpodii speciebus Trinii, præsertim *C. Steveni* et *presso*, incertus sum.

56. *COLPODIUM LATIFOLIUM*, panicula coarctata lanceolata, foliis planis lato-linearibus.

Agrostis paradoxa, *B. in Ross' voy. ed. 2*, v. 2, p. 192.
(*Ante*, p. 177.)

DESC. *Germen* robustum, spithameum—pedale, glabrum. *Culmus* è basi decumbenti v. radicanti adscendens, nunc erectus, teres, laevis, foliatus, basi vaginis scariosis tectus. *Folia* plana, linear-lanceata, acuta, stricta, utrinque marginibusque retrorsum scabris : *vaginae* scabriuscule, ad basin usque fissæ, suprema folio proprio longior : *ligula* obtusa, imberbis, erosa, denticulata, folio latior. *Panicula* coarc-tata, angusto-lanceolata, fusco-purpurea, perianthiorum apicibus albis, sesquiuncialis—biuncialis, ramis brevibus, semiverticillatis, appressis, inferioribus demum modice patentibus, pedunculis pedicellisque pauci-denticulatis, strictis, apice vix dilatato cum locusta continuo. *Gluma* uniflora, bivalvis, mutica, herbaceo-membranacea, glabra, valvulis suboppositis, concavis vix carinatis, obtusiusculis v. acutis, integris, semitrinerviis, *inferiore* paulo breviore, nervis lateralibus brevissimis, *superiore* acutiore, nervis lateralibus magis manifestis sed longe infra apicem evanescentibus. *Perianthium* intra glumam, qua haud duplo longius, brevissime pedicellatum, cum pedicello crasso articulatum, basi obliqua, herbaceo-membranaceum, textura fere glumæ, muticum, per lentem pube brevissima conspersum, intra glumam è majore parte viride, supra eandem fusco-purpureum, apice scarioso albicanti. *Valvulae* concavæ, textura omnino similes, longitudine subæquales, *inferior* nervo centrali manifesto saepius apicem muticum attingenti, nunc [celxxxvii] in setulam dorsalem brevissimam altitudinem valvulae subæquantem desinente, lateralibus utrinque duobus obsoletis, infra apicem prorsus evanescentibus ; *superior* obtusior, integerrima, dorso angusto planiusculo vel leviter convexo, linearis, dinervi, nervis parallelis, tenuibus, nudis, lateribus dorso aliquoties latioribus, parallelis, marginibus nudis. *Lodiculae* duæ, subcollaterales, membranaceæ, semibifidæ, dentibus acutis, imberbes, longitudine ovarii. *Stamina* 3, filamentis capillaribus, antheris fusco-stramineis, utrinque bifidis. *Ovarium* ovatum, acutum, glabrum, exsulcum. *Styli* brevissimi, approximati, vix manifesti. *Stigmata* hyalina, dense plumosa, apicibus acutis.

Obs. In exemplaribus plerisque nullum certe rudimentum flosculi secundi, quod tamen in nonnullis à Melville Island atque in exemplari à Possession Bay adest, setuliforme, hispidulum; et in specimine unico à Melville Island locustas nonnullas bifloras flosculo secundo pedicellato perfecto observavi.

57. *POA ANGUSTATA*, panicula simplici coaretata linear-lanceolata, locustis 4-5-floris, gluma inferiore dimidio minore, perianthiis apice erosis: valvula inferiore basi clavata lateribus glabriusculis, foliis angusto-linearibus.

DESC. *Gramen* 4-6-unciale, glabrum, erectum; *radice* fibrosa. *Culmi* foliati, basi quandoque divisi, lèves. *Folia* angusto-linearia, plana, acuta, glabra, lèvia; *vaginæ* subcylindraceæ, lèves, suprema folio proprio longior, omnes ipsa basi integra; *ligula* subquadrata tam lata quam longa, apice dentato dente medio paulo longiore. *Panicula* erecta, angustata, circumscriptio lineari-lanceolata, ramis paucifloris, pedicellis denticulatis, strictis, viridibus, apice paulo dilatato, cum locusta haud omnino continuo. *Locustæ* oblongæ, coloratae, saepius quadrifloræ. *Glumæ* hyalinæ, glaberrimæ, uninerviæ, cum pedicellis persistentes, valvula inferiore fere dimidio minore; superiore duplo latiore et fere duplo longiore, obtusiore, perianthio dimidio circiter breviore, nervis lateralibus obsoletis. *Perianthia* separatim decidentia, rachi locustæ glabra; *valvula inferior* oblonga, concava, acutiuscula, apice scarioso erosio-denticulato, quinque-nervis, lateribus infra medium pube rara in nervis extimis crebriore instructis, ipsa basi absque lana implexa; *superior* paulo brevior, dinervis, nervis viridibus, denticulatis, lateribus complicatis. *Lodiculæ* 2, hyalinæ, imberbes, semibifidae. *Stamina* 3.

58. *POA ABBREVIATA*, panicula simplicissima coaretata subovata, locustis 4-5-floris, glumæ valvulis subæqualibus acutissimis perianthia basi lanata lateribus pubescentia æquantibus, foliis involuto-setaceis.

DESC. *Gramen* 3-4-unciale. *Culmi* foliati, basi saepe divisi, lèves. *Folia* involuta, subsetacea, retrorsum scabra, *vaginæ* fere ad basin usque fissæ, cylindraceæ. *Panicula*

vix semuncialis, ramis alternis, subbifloris, strictis, lævibus, vix denticulatis. *Locustæ* oblongæ, coloratæ. *Glumæ* acutissimæ, valvulis longitudine subæqualibus, carinatis, glaberrimis, *inferiore* manifeste angustiore, paululum breviore, uninervi; *superiore* basi trinervi. *Perianthia* glumas paulo superantia; *valvula inferior* ipsa basi lana implexa parca instructa, carina à basi ad duas tertias partes longitudinis sericea, linea pariter sericea utrique margini approximatæ mata, à basi ad eandem fere altitudinem attingenti, intersticiis pubescentibus subsericeis; *superior* dinervis, nervis pectinatim denticulatis, lateribus induplicatis latiusculis. *Lodiculæ* 2. *Stamina* 3, antheris stramineis. *Ovarium* imberbe. *Stigmata* 2, subsessilia, plumosa, hyalina.

59. *POA ARCTICA*, panicula effusa: ramis paucifloris capillaribus lævibus locustisque coloratis ovatis 3-4-floris, glumis subæqualibus, perianthii valvula inferiore basi lanata carina lineaque submarginali sericeis: intersticiis pubescentibus, foliis linearibus: ligula subquadrata erosa.

Poa laxa, *Br. in Ross' voy. ed. 2, v. 2, p. 192.* (*Antè*, p. 177.) *Hooker in Scoresby's greenl. p. 410*, non Willdenovii.

Desc. *Gramen* 5-8-pollicare. *Culmi* erecti v. adscendentes, basi quandoque divisi, graciles, læves, foliati. *Folia radicalia* angusto-linearia, canaliculata, culmo aliquoties breviora; *culmea* paulo latiora, plana, marginibus lævibus, denticulis obsoletissimis: *vaginæ* strictæ, striatæ, læves, ipsa basi integra; *ligula* subquadrata, nunc paulo longior quam lata, apice eroso-inciso. *Panicula* sæpius effusa, nunc rara, nunc minus effusa, rarissime subcoartata, rachi ramisque fuscis, ramis 3-4, semiverticillatis, 1-2-floris, capillaribus, lævibus. *Locustæ* ovatae v. oblongo-ovatae, fusco-purpureæ, apicibus valvularum stramineo-fuscis ipsoque margine albo, 3-4-floræ, cum rudimento minuto scarioso longius pedicellato quarti v. quinti; rachi articulatim solubili, per lentem scabriuseula. *Glumæ* subæquivalves, carinatæ, acutæ, fusco-purpureæ, glaberrimæ, carina extra medium obsoletissime denticulata; *inferiore* angustiore, nervis lateralibus obsoletioribus, altero obsoletissimo; *supe-*

riore vix longiore, nervis lateralibus manifestioribus. Perianthii valvula inferior oblonga, subcarinata, ipsa basi v. potius ex apice articuli racheos lana longa contortuplicata flosculos subnectenti, carina à basi ad duas tertias partes longitudinis sericea, villis brevibus, supra obsoletissime denticulata, lateralibus à basi ad eandem circiter altitudinem ac portio sericea carinæ pubescentibus, linea intramarginali sericea : valvula superior inferiore paulo brevior, dinervis, nervis viridibus, pectinato-ciliatis pilis brevibus, lateribus induplicatis axin fere attingentibus. Lodiculæ 2, cuneiformes, semibifidae dentibus acutis, hyalinæ, imberbes, ovario breviores. Stamina 3, antheris stramineis. Ovarium oblongum, imberbe. Styli 2, brevissimi. Stigmata hyalina, laxe plumosa ramis denticulatis.

Obs. Exemplaria nonnulla statura majore, locustis acutioribus, glumis acuminatis perianthia inferiora subæquantiibus, foliis latioribus.

Poa laxa, *Willden. sp. pl.* 1, p. 386, quam ex eodem monte Silesiae ubi à b. Haenke detecta fuit habeo à D. Trevirano communicatam, differt statura minore, panicula coarctata, rachi ramisque paniculæ et glumis infra medium viridibus, perianthiis acutioribus lana baseos parciore; locustæ rachi lævi.

Poa flexuosa, *Host gram. austr.* 4, p. 15, t. 26, quæ similis videtur P. arcticæ panicula effusa et locustæ colore figura et pubescentia, differt paniculæ rachi ramisque viridibus magis divisus scabris, glumarum carinis longitudinaliter denticulatis.

60. FESTUCA BREVIFOLIA, racemo subsimplici erecto, [celxxxix flosculis teretibus supra seabriusculis arista duplo longioribus, foliis setaceis vaginisque lævibus: culmeo supremo multoties breviore vagina sua laxiuscula.

Obs. Facies et statura fere F. ovinæ inter quam et F. Halleri media; priori forsitan affinis.

61. FESTUCA VIVIPARA.

Obs. Nullam observationem habeo de exemplari unico Festucæ cuiusdam viviparæ olim viso in herbario D. Sabine, ulterius examinando.

PLEUROPOGON.

CHAR. GEN. *Locustæ* multifloræ, cylindraceæ. *Gluma* abbreviata, inaequivalvis, mutica. *Perianthii valvula inferior* mutica, obtusa, concava, nervosa, apice scarioso : *superior* nervo utroque lateraliter biseto ! *Lodiculæ* distinctæ. *Styli* 2. *Stigmata* plumosa. *Caryopsis* libera, lateribus compressis.

Gramen elegans. Folia plana, angusta, vagina integra, ipso apice tantum fisso. Racemus simplex, locustis cernuis, purpureis, nitentibus. *Gluma valvula inferiore* acuta, *superiore* latiore obtusa. Perianthia distincta, valvula inferiore 5-7-nervi, *superiore* lanceolata emarginata, pari *superiore* setarum brevissimo.

Obs. Genus *Glyceriæ* proximum, quacum locustis teretibus, perianthiis obtusissimis et vaginis foliorum integris convenit ; differt præsertim setis lateralibus nervorum valvulae superioris perianthii, lodiculis distinctis, stigmatibus haud decompositis, caryopside lateraliter compressa et inflorescentia.

Character fere essentialis in nervis valvulae superioris perianthii latere setigeris ; analoga structura enim vix, quantum scio, in ullo alio gramine obtinet nisi in *Uniola latifolia Mich. am.*, ubi equidem nullis aliis differentiis comitata pro charactere specifico tantum habenda.

62. PLEUROPOGON SABINII.

DESC. *Gramen* 3-unciale usque spithameum, glabrum. *Culmi* erecti, foliati, striati, laeves, simplices. *Folia* radicalia angustiora, longiora ; culmea linearia, plana, brevia, laevia : *vaginæ* paulo compressæ, striatæ, glabræ, laeves, fere ad apicem integræ, ipso apice fisso, marginibus scariosis, suprema folio proprio longior : *ligula* brevissima, rotundata, emarginata. *Spica* racemosa, simplicissima, rachi striato-angulata, laevi, viridi, pedunculis lateralibus glumam vix

superantibus, recurvis, lævibus, indivisis, alternis, distantibus. *Locustæ* subcylindraceæ, cernuæ v. pendulæ, semunciales, purpureæ, nitidæ, per lentem tenuissime pubescentes. *Gluma* bivalvis, nana, inæqualis, membranacea, purpurea, mutica; *valvula inferiore* ovata, acuta; *superiore* obovata, ^{exc} obtusissima, inferiore duplo latiore, paulo longiore. *Perianthia* alterna, distincta. *Valvula inferior* obovato-oblonga, obtusissima, concava, quinquenervis, extus pube brevissima appressa conspersa, apice marginibusque ab apice ad medium albis, scariosis, nervis omnibus infra apicem desinentibus, medio in mucronulum brevissimum, marginem valvulae vix attingentem producto. *Valvula superior* longitudine fere inferioris, manifeste angustior, elliptico-lanceolata, apice profunde emarginato, lateribus induplicatis, dinervis, nervis brevissime ciliatis, singulis bisetis, *setis* lateralibus, per paria oppositis, *duæ inferiores* infra medium valvulae ortæ, subulato-filiformes, strictæ, modice patentes, denticulatæ, longitudine circiter dimidii totius valvulae; *duæ superiores* paulo supra medium valvulae ortum ducentes, brevissimæ, denticulatæ, mucroniformes, altera quandoque obsoleta. *Lodiculæ* 2, collaterales, approximatæ, brevissimæ, truncatæ, basi leviter cohærentes, sed absque læsione separandæ. *Stamina* 3, filamentis capillaribus, antheris linearibus utrinque semibifidis. *Ovarium* ovatum, imberbe. *Styli* 2, glabri. *Stigmata* laxè plumosa, hyalina, ramis denticulatis, superioribus vix brevioribus. *Caryopsis* libera, lateraliter compressa, ventre angusto-lineari, leviter canaliculato, axi longitudinaliter saturatiore. *Embryo* caryopside triplo brevior.

Obs. Duplex varietas.

a, elatior, subspithamea, antheris stramineis. Tab. D, f. 1—7.

β , 3-4-uncialis, antheris purpureis. Tab. D, f. 8—10.

The specific name is given in honour of Captain Edward Sabine, in whose herbarium, the most extensive formed in the voyage, numerous specimens were found of both varieties of this remarkable grass.

EXPLICATIO TABULÆ D.¹

PLEUROPOGON SABINII. 1. Varietatis *a*, planta magnitudine naturali. 2. ejusd. locusta cum pedunculo et portione racheos magis aucta. 3. perianthium clausum articulo racheos insidens, auctius. 4. id. expansum, pariter auctum. 5. valvula superior perianthii facie visa ad id. augment. 6. pollen. 7. flosculus perianthio orbatus exhibens stamina pistillum et lodiculas auct. uti 4 et 5. 8. Var. *β*, planta mag. natur. 9. ejusd. locusta cum pedunculo ad augm. id. ac. 2. 10. perianthium expansum genitalia et lodicularum alteram exhibens ad augm. n. 4.

DUPONTIA.

CHA. GEN. *Gluma* subæquivalvis, scariosa, concava, mutica, locustam 2-3-floram subæquans. *Perianthia* mutica, scariosa, (basi barbata,) altero pedicellato; valvulis integris, inferiore concava. *Lodiculæ* 2. *Ovarium* imberbe. *Stigmata* subsessilia. *Caryopsis* - - - -

Gramen *glabrum*, *erectum*. Folia *linearia*, *plana*, *vaginis semifisis*, *basi integra*. Panicula *simplex*, *coarctata*, *fusco et purpurascenti varia*, *pedicellis cum locustis continuis*, *perianthiis separatis solubilibus*.

cxxxi] *Obs.* Ad Deschampsiam proxime accedit hocce genus; distinguitur perianthiis muticis, valvulis integris nec dentatis. Cum Catabrosa, facie diversissima, convenit pluribus notis, differt glumis locustam subæquantibus, perianthiis basi brevè barbatis. A Poa diversum locustis haud compressis, glumis perianthiisque concavis nec carinatis. Ad confirmandum genus caryopsis desideratur.

This genus is named in honour of Monsieur Dupont, of Paris, author of a valuable essay on the Sheath of the leaves of Grasses, and of observations on the genus Atriplex.

¹ See Note at p. 187.

63. DUPONTIA FISHERI.

DESC. *Gramen* 6-10-unciale, erectum. *Culmi* simplices, foliati, læves, glaberrimi. *Folia radicalia* et inferiora culmi canaliculata, angusto-linearia, acuta, lævia, 2-3-uncialia, *vaginis* strictis, scariosis, vix ad medium fissis; *culmea* 1-2 superiora breviora, plana, lævia, *vaginis* propriis laxiusculis foliaceis ultra medium fissis longiora: *ligula* mediocris, obtusa, subtruncata, imberbis. *Panicula* coaretata, spiciformis, basi quandoque interrupta, purpureo-fusca, nitens, sesquiuncialis—biuncialis, ramis subgeminatis, paucifloris, pedicellisque lævibus cum locusta continuis. *Locustæ* ovatae, bifloræ, cum rudimento clavato setuliformi tertii flosculi, nunc trifloræ flore tertio completo, nunc bifloræ absque tertii rudimento. *Gluma* bivalvis, subæqualis, mutica, glaberrima, purpurascens, subnitens, margine pallido scarioso, longitudine locustæ. *Valvulae* concavæ nec carinatae, oblongo-lanceolatae, *inferior* paulo angustior, acuminata v. acutissima, uninervis; *superior* semi-trinervis, medio paulo infra apicem lateralibus longe intra marginem evanescentibus. *Perianthia* subconformia; *inferius* intra glumam subsessile, à pedicello brevissimo separabile; *superius* cum apice paulo dilatato pedicelli brevis articulatum, facile solubile; utriusque *valvula* *inferior* ovata mutica obtusa, vix unquam acuta, integra, concava, ipsa basi pilis brevibus strictis albis barbata, et à basi fere ad medium pilis brevioribus strictis subadpressis subsericea, trinervis, nervis lateralibus intra marginem evanescentibus, medio paulo infra apicem desidente: *superior* longitudine inferioris, manifeste angustior, linearis-oblonga, glaberrima, dinervis, nervis brevibus, intersticio linearis concaviusculo. *Lodiculæ* due, distinctæ, collaterales, membranaceæ, hyalinæ, subovatae, v. cuneatae, apice eroso-dentato, ovario longiores. *Stamina* 3, filamentis distinctis, capillaribus, antheris fusco-purpureis, linearibus utrinque bifidis. *Ovarium* ovale, glabrum. *Stigmata* 2, subsessilia, hyalina, dense plumosa, ramis apicem versus brevioribus.

Obs. The specific name is that of Mr. Fisher, whose herbarium contained the most complete series of specimens of this grass.

64. DESCHAMPSIA BREVIFOLIA, panicula coarctata lanceolata : pedicellis lœvibus, locustis 2-3-floris, arista stricta valvulam subæquante, foliis involutis : caulinis abbreviatis.

Desc. *Gramen* 3-5-unciale, glabrum. *Culmi* simplices, erecti, foliati. *Folia* inferiora involuto-subulata, stricta, uncialia—sesquiuncialia; *vaginis* strictis, folio brevioribus, ipsa basi integra : *ligula* oblonga, lacinulata ; *supremum* brevissimum, vagina elongata, laxiuscula, ligula breviore. *Panicula* coarctata, lanceolata v. oblonga, fusco-purpurascens, scariosa, ramis semiverticillatis. *Locustæ* bifloræ, raro trifloræ, semper cum rudimento pedicelliformi flos-^{cæciliæ} culi alterius. *Gluma* subæquivalvis, mutica, acuta, valvulis lanceolatis, concavis, acutissimis, scariosis, disco purpurascenti, limbo pallido, uninerviis, locusta paulo brevioribus. *Perianthia* subuniformia, scarioso-membranacea, separatim solubilia, inferius sessile ; *valvula inferior* ipsa basi barbata, pilis brevibus, strictis, albis, cæterum glabra, concava, subquinquenervis, nervis omnibus lœvibus, lateraliibus obsoletis, apice eroso-multidentato, dorso sæpius infra medium aristata, arista setacea, recta, denticulata, valvulam ipsam vix vel paulo superanti : *superior* longitudine inferioris, angustior, dinervis, apice bidentato, quandoque semi-bifido. *Lodiculæ* 2, collaterales, hyalinæ, imberbes, acutæ, ovario longiores. *Stamina* 3, antheris purpureis, utrinque bifidis. *Ovarium* glabrum. *Stigmata* 2, sessilia, hyalina, dense et breve plumosa. *Flosculus superior* pedicello barbato quocum articulatus insidens, paulo minor, arista valvulæ inferioris medio vel supra medium dorsi inserta. *Rudimentum flosculi tertii setula* est extus longitudinaliter barbata, clavula scariosa minutissima terminata.

β . *Perianthia* mutica.

Hujus quatuor exemplaria tantum visa à varietati *a*. facie paulo diversa folio supremo longiori.

TRISETUM.

Triseti species *Palis. agrost. p. 88*, charactere reformato.
CHAR. GEN. *Locustæ* 2-5-floræ, ancipites. *Gluma* carinata,

membranacea, subaequivalvis. *Perianthii valvula inferior* carinata apice bidentata v. biseta, dorso (supra medium) aristata. *Caryopsis libera*, exsulca, lateraliter compressa.

Gramina cæspitosa; vaginis longitudinaliter fissis. Panicula *sæpe coarctata*, *aristis arcuato-patulis*.

Obs. A *Deschampsia* differt locustis ancipitibus, glumis carinatis, perianthii valvula inferiore carinata apice attenuato bidentato v. biseto, caryopside lateraliter compressa. Ab *Avenis* plerisque glumis perianthiisque carinatis; ab omnibus caryopside exsulca et lateribus compressis.

65. TRISSETUM SUBSPICATUM, *Palis. agrost.* p. 88. *Trisetum airoides*, *Roem. et Sch. syst.* 2, p. 666, exclus. syn. *Wulfen et Host. Richardson in Franklin's journ.* p. 731.

Aira spicata, *Linn. sp. pl. ed.* 2, p. 95, *fl. lapp. n.* 47. *Flor. Dan.* t. 228, mala. *Gunn. norv. n.* 422. *Wahlenb. lapp. p.* 33.

Aira subspicata, *Linn. syst. nat. ed.* 12, v. 2, p. 91. *Willden. sp. pl.* 1, p. 377. *Pers. syn.* 1, p. 77. *Zoëg. pl. island. in Olafs. reise* 2, p. 234. *Giesecke greenl. in Brewster's Edin. encyclop.*

HIEROCHLOE.

Hierochloe Gmel. sib. 1, p. 100. *Br. prodr. flor. nov. holl.* p. 208. *Trin. agrost.* p. 130.

Hierochloa et Torea, *Palis. agrost.* p. 62 et 63.

CHAR. GEN. *Gluma* subaequivalvis, locustam trifloram ^[ccxcii] aequans. *Perianthia* bivalvia, *lateralia* mascula, triandra; *terminale* hermaphroditum, diandrum.

Obs. Relationem veram Anthoxanthi ad Hierochloem, in prodr. flor. nov. holl. p. 209, primum indicatam, optime confirmat planta Javanica intermediae structuræ à D. Horsfield detecta; in hac enim perianthium *lateralium* *inferius* masculum bivalve, *superius* univalve, neutrum: *terminale* hermaphroditum. Hujus novi generis (Ataxia) habitus potius est Anthoxanthi, quocum etiam gluma inaequivalvi quadrat.

Cum Hierochloe characteribus nonnullis convenit Arthro-

chloa nob. (*Holcus Palis. Trinii*, et *Wahlenb.* non *Linnæi gen. et sp. pl. ed. prima*, nec *Schreberi* nec *Gærtneri*;) quæ tamen facile distinguitur ab hoc genere uti et ab *Aira* et *Arrhenathero*, gluma cum apice pedicelli articulata et unâ cum locusta decidua.

66. HIEROCHLOE ALPINA, *Roem. et Sch. syst. 2, p. 515.*
Br. in Ross' voy. ed. 2, vol. 2, p. 194. (*Antè, p. 178.*)
Richardson in Franklin's journ. p. 731.

Holcus alpinus, *Swartz in Schrad. neue journ. 2, st. 2,* p. 45, t. 3, *Wahlenb. lapp. p. 31, t. 2.* *Svensk bot. 438.*
Flor. Dan. 1508. *Giesecke greenl. in Brewster's Edin. encyclop.*

67. HIEROCHLOE PAUCIFLORA, racemo simplici, flosculo masculo superiore brevissime setigero, foliis culmi brevissimis; radicalibus involutis.

DESC. *Gramen 3-5-unciale.* *Radix* repens. *Culmi* erecti, infra foliati supra nudi, striati. *Folia radicalia* subulata, marginibus involutis, culmo aliquoties breviora; *culmea* abbreviata latè subulata, marginibus inflexis, vaginis suis laxiusculis multoties breviora. *Racemus* erectus, simplex vel subsimplex, pauciflorus, pedicellis lœvibus. *Locustæ* ovatæ, acutæ, trifloræ. *Glumæ* bivalves, scariosæ, ovatæ, concavæ, acutiæ, glaberrimæ, locustam subæquantes, valvula inferiore manifeste minore. *Flosculi laterales* masculi, triandri, bivalves, chartacei, *valvula inferior* ovata, concava, marginibus infra medium nudiusculis supra omnino nudis, flosculi superioris mox sub apice emarginato setigera, seta brevissima stricta valvulam vix superante; flosculi inferioris mutica v. per-obsolete setigera; utriusque valvula superior angustior, linearis, dinervis, semibifida. *Flosculus terminalis* hermaphroditus, diander, muticus: *valvula inferior* concava, quinquenervis, extra medium dorso lateribusque pilosiusculis, chartacea, fusca, apice scarioso; *superior* linearis, hyalina, glabra, acuta, indivisa, uninervis. *Lodiculæ* 2, collaterales, lanceolatæ, acuminatæ, hyalinæ, ovario longiores. *Ovarium* glabrum. *Styli* 2. *Stigmata* alba, dense plumosa.

ACOTYLEDONES.

[ccxciv]

MUSCI.

68. **POLYTRICHUM PROPINQUUM**, caule simplici elongato, foliis margine serrulatis dorso lœvibus.

Obs. Species, absque fructificatione haud determinanda, à Polytricho communi satis diversa videtur.

69. **POLYTRICHUM HYPERBOREUM**, caule ramoso, foliis piliferis marginibus induplicatis discum (totum lamelliferum) operientibus, capsula tetragona apophysata.

DESC. *Caules* sæpius ramosi ramis fastigiatis, nunc simpliciores innovatione una alterave divisi. *Folia* è dilatata senivaginanti basi subulata, madore patula, siccitate appressa, disco toto lamellifero; marginibus latis, induplicatis, integerrimis, membranaceis, à basi dilatata usque ad apicem altero alterum equitante; *pilus* apicis hyalinus folio aliquoties (2-3-plo) brevior, per lentum denticulatus, strictus. *Masculi flores* disciformes, in distincto individuo sæpe minore. *Seta* nitens caulis procerioribus (biuncialibus) subsimplicibus brevior, fastigiato-ramosos superans v. æquans. *Capsula* erecta v. inclinans tetragona, angulis in aciem attenuatis; apophysis angulata angustior. *Operculum* hemisphæricum cum mucronulo brevi. *Peristomium* dentibus 64. *Epi-phragma* demum separabile. *Calyptra exterior* è villis dense implexis.

Obs. Duplex varietas.

α , caulis fastigiato-ramosis setam vix aequantibus.

β , caulis innovando subramosis seta longioribus.

Hæc P. pilifero proxima ab eodem differt caulis elongatis innovando ramosis, pilis folio aliquoties brevioribus.

70. **POLYTRICHUM BREVIFOLIUM**, caule ramoso, foliis serrulatis muticis madore erectis siccitate appressis, capsula inclinata obovata exapophysata.

DESC. *Muscus* sesquiuncialis. *Caulis* divisi, ramis fastigiatis. *Folia* è basi dilatata semimembranacea subulata, extra medium serrulata, acuta, mutica, disco toto lamellifero, dorso lœvi. *Seta* lœvis, pallida. *Capsula* lœvis, cernua, inæquilatera. *Operculum* conico-hemisphæricum, rostro subulato recurvo diametrum baseos vix æquante. *Peristomii dentes* 40, æquidistantes, intersticiis angustiores. *Epiphragma* crassiusculum. *Calyptra exterior* è villis arcte implexis.

Obs. Muscus, cuius tria tantum exemplaria à nobis visa in herbario D. Ross, nimis forsan affinis *P. alpino* L.

[*ccxcv*] 71. *POLYTRICHUM SEPTENTRIONALE*, *Sw.* in *act. holm.* 1795, p. 270. *Musc. suec.* p. 107, t. 9, f. 18. *Menzies* in *Linn. soc. transact.* 4, p. 82, t. 7, f. 5.

Obs. In herbario D. Fisher absque fructificatione visum, ideoque dubium.

72. *POLYTRICHUM LÆVIGATUM*, *Wahlenb.* *lapp.* p. 349, t. 22. *Hooker musc. exot.* t. S1.

Catharinea lœvigata, *Bridel mant.* p. 202.

Catharinea glabrata, *Hooker isl.* 2, p. 340, et 1, p. 24.

Obs. *Peristomii dentes* sæpius quantum determinare potui 16, quandoque 32, lineares, acutiusculi, hyalini, per lentem longitudinaliter striati, striis sæpius paulo flexuosis, in hemisphærium conniventes; dum 16 approximati intersticiis angustissimis, parum inæquales, latioribus nunc bidentatis; dum 32 æquales, intersticiis manifestis. *Epiphragma* hyalinum, diametro longitudinem dentis vix æquante. *Membrana interior capsulæ* exteriori approximata, intus lœvis absque processibus plicisve. *Columella* libera, angulata, longitudine fero capsulæ. *Capsula* per lentem modice augentem manifeste areolata.

73. *HYPNUM NITENS*, *Hedw.* sp. *musc.* p. 255. *Smith brit.* 3, p. 1316. *Engl. bot.* 1646. *Musc. brit.* p. 100. *Wahlenb.* *lapp.* p. 381.

74. *HYPNUM CORDIFOLIUM*, *Hedw.* *stirp. crypt.* 4, p. 97,

t. 37. *Sp. musc.* p. 254. *Smith brit.* 3, p. 1318. *Engl. bot.* 1447. *Musc. brit.* p. 107.

75. HYPNUM ADUNCUM, Linn. *sp. pl. ed. 2*, p. 1592. *Smith brit.* 3, p. 1327. *Hedw. stirp. crypt.* 4, p. 62, t. 24. *Sp. musc.* p. 295.

76. LESKIA RUFESCENS, Schwaegr. *suppl. 1*, *sect. post. p. 178*, t. 86.

Hypnum rufescens, Dicks. *crypt. fasc. 3*, p. 9, t. 8, f. 4. *Smith brit.* 3, p. 1316. *Engl. bot.* 2296. *Musc. brit.* p. 99.

77. MNIUM TURGIDUM, Wahlenb. *lapp.* p. 351, t. 23. Schwaegr. *suppl. 1*, *sect. post. p. 123*, t. 77. *Br. in Ross' voy. ed. 2*, vol. 2, p. 194. (*Antè*, p. 178.) Richardson in *Franklin's journ.* p. 756.

78. TIMMIA MEGAPOLITANA, Hedw. *stirp. crypt. 1*, p. 83, t. 31. *Sp. musc.* p. 176. Schwaegr. *suppl. 1*, *sect. post. p. 84*. Richardson in *Franklin's journ.* 756. *Timmia cucullata*, Michaux *am. 2*, p. 304.

79. BRYUM ROSTRATUM, Schrad. *spicil.* p. 72. *Smith brit.* 3, p. 1369. *Engl. bot.* 1745. *Musc. brit.* p. 126, t. 30. *Mnium rostratum*, Schwaegr. *suppl. 1*, *sect. post. p. 136*, t. 79.

Obs. Muscus hicce, neenon sex proxime præcedentes absque fructificatione tantum visi.

80. BRYUM CALOPHYLLUM, foliis ovatis obtusis con- [ccxvi] cavis : marginibus simplicibus integerrimis, capsulis obovatis pendulis.

DESC. *Cæspites* densi. *Caules* innovationibus continuis divisi, 2-5 unciales, vetusti tomento radicali copioso et foliis emarcidis tecti. *Rami annotini* fastigiati, basi tantum tomento radicali parciore instructi, supra glabri. *Folia* uniformia, sparsa, approximata, ovata v. subovalia, modice concava, obtusa, mutica, marginibus simplicibus nec recurvis nec incrassatis, arcolis subrectundis, uniformibus,

nervo valido, apicem folii attingenti absque mucronulo excurrenti, saepius purpurea, quandoque viridia, madore patent-erecta, siccitate appressa et paulo undulata. *Seta terminalis*, ramos annotinos superans, castanea, laevis, apice arcuato-recurvo. *Capsula* obovata, basi acutiuscula, vix attenuata, laevis. *Operculum* concolor, hemisphaericum, papilla minuta. *Peristomium* duplex, *exterius* dentibus 16, rufescens acumine pallidiore, transversim striatis; *interius* album, è membrana lata leviter carinata, terminata ciliis 16, imperforatis, cum dentibus exterioris alternantibus, intersticiis subdenticulatis.

Obs. Peristomii structura Pohliae accedit.

81. POHLIA BRYOIDES, foliis ovato-lanceolatis acuminatis integerrimis margine recurvis, capsulis pyriformi-oblongis, operculo conico, floribus masculis capitato-discoideis.

DESC. *Cæspites* densi. *Caules* innovatione continuo ramosi, infra tomento radicali castaneo-rubo reliquiisque foliorum tecti. *Folia* late viridia, ovato-lanceolata, acuminata, nervo valido, in acumen excurrenti, marginibus integerrimis angustissime recurvis, areolis parvis oblongo-trapezoideis. *Masculi Flores* monoici, ramos annotinos terminantes, gemmaceo-discoidei, foliis perigonialibus exterioribus erectis, intimis nanis. *Antheræ* numerosæ, cylindraceæ, brevissime pedicellatae. *Paraphyses* filiformes, articulatae. *Feminei Flores* terminales; *vaginula* capsulae naturæ pistillis abortivis numerosis paraphysibusque fere ad apicem truncatum stipata. *Seta* mediocris, laevis, fusca, apice arcuato. *Capsula* pendula, fusca, laevis, oblongo-pyriformis, basi attenuata in apophysim obconicam ipsa theca breviorem. *Operculum* hemisphaerico-conicum, capsula quandoque paulo saturatius. *Annulus* latiusculus, striatus. *Peristomium* duplex: *exterius* dentibus 16, acuminatis, integerrimis, transversim striatis, fusco-rufescens acumine pallido; *interioris* membrana vix carinata, ciliis 16 cum dentibus exterioris alternantibus, absque intermediis minoribus, cum exteriore diu cohærens sed deum liberum.

82. POHLIA ARCTICA, foliis (viridibus) ovato-lanceolatis

acuminatis : marginibus integerrimis recurvis, capsulis pyriformi-oblongis, operculo hemisphærico, floribus hermaphroditis.

Obs. *Muscus* per singula fere puncta præcedenti simillimus, præter flores hermaphroditos et operculum hemisphæricum ; ambo forsitan ad unam eandemque speciem polygamam pertinentes. *Flores* gemmacei, terminales, foliis perichætialibus interioribus nanis. *Antheræ* numerosæ, cum pistillis vix paucioribus intermixtæ, et cum horum abortientibus paraphysibusque filiformibus vaginulâ capsulae maturæ fere ad ejusdem apicem insidentes. *Peristomium interius* structura præcedentis pariterque cum exteriori ^{ceccxvii} diu cohærens, demum vero liberum et in omni statu separabile. Huic et præcedenti valde affinis videtur *Ptychostomum compactum* *Hornschuch*, et *Schwaegr. suppl.* 2, *sect.* 1, *p.* 56, *t.* 115, cui peristomium interius cum exteriore arctius cohæret. Hujus generis? alteram speciem arcticam habeo, *Ptychostomum pulchellum*, capsula sphærico-ovata, operculo hemisphærico mutico, dentibus peristomii exterioris apice liberis basi mediante membrana (peristomio interiore) cohærentibus, foliis ovato-lanceolatis acuminatis integerrimis.

83. *POHLIA PURPURASCENS*, foliis (purpurascentibus) ovato-lanceolatis acutissimis : marginibus integerrimis recurvis, capsulis pyriformi-oblongis, operculo hemisphærico obtuso, floribus hermaphroditis.

Obs. Præcedentis forsitan varietas, vix• distinguenda nisi notis supra datis.

Propter peristomii interni structuram hanc cum duabus præcedentibus ad Pohliam retuli, facies tamen potius Bryi est, et omnes B. cæspiticio quam maxime affines.

84. *TRICHOSTOMUM LANUGINOSUM*, *Hedw. stirp. crypt.* 3, *p.* 3, *t.* 2. *Sp. musc.* *p.* 109. *Schwaegr. suppl.* 1, *sect.* 1, *p.* 149. *Smith brit.* 3, *p.* 1240. *Engl. bot.* 1348. *Turner musc. hibern.* *p.* 38. *Musc. brit.* *p.* 60, *t.* 19. *Hooker scot. par.* 2, *p.* 134. *Wahlenb. lapp.* *p.* 329. *Richardson in Franklin's journ.* *p.* 755.

Racomitrium lanuginosum, *Brid. mant.* p. 79.
Obs. Specimina pauca et absque fructificatione.

85. *DIDYMODON CAPILLACEUM*, *Schrad. spicil.* p. 64.
Sw. in act. holm. 1795, p. 237. *Musc. suec.* p. 28. *Roth. germ.* 3, p. 199. *Web. et Mohr. tasch.* p. 155. *Schkuhr deut. moos.* p. 66, t. 29. *Wahlenb. lapp.* p. 314. *Carpat.* p. 336. *Voit musc. herbip.* p. 34. *Musc. brit.* p. 67, t. 20. *Brid. mant.* p. 100. *Hooker scot. par.* 2, p. 136. *Richardson in Franklin's journ.* p. 755.

Swartzia capillacea, *Hedw. stirp. crypt.* 2, p. 72, t. 26.

Cynontodium capillaceum, *Hedw. sp. musc.* p. 57. *Schumach. sælland.* 2, p. 40.

Cynodontium capillaceum, *Schwaegr. suppl.* 1, *sect.* 1, p. 114.

Trichostomum capillaceum, *Smith brit.* 3, p. 1236. *Engl. bot.* 1152. *Turner musc. hibern.* p. 35.

Bryum capillaceum, *Dicks. crypt. fasc.* 1, p. 4, t. 1, f. 6.

Bryum tenuifolium, *Villars dauph.* 4, p. 868.

Bryum n. 1806. *Hall. hist.* 3, p. 44, t. 45, p. 1.

Obs. Duas varietates à Melville Island habeo, quarum.

a. *Statura et foliis laxiusculis cum D. capillaceo europæo convenit*, paululum differt capsulis ovalibus nec oblongis.

β. *Statura humiliore, foliis strictioribus et brevioribus*; media quasi inter *D. capillaceum vulgare* et *D. subulatum Schkuhr deut. moos.* p. 65, t. 28, quod ad eandem speciem pertinere videtur.

[cxcviii] In utraque varietate atque in *D. capillaceo Richardson*, *l. c.* flores monoicos, masculis gemmiformibus alaribus prope apicem ejusdem rami cum femineo gemmiformi, necnon annulum manifestum, in *D. capillaceo*, jamjam à Voitio *l. c.* notatum, et dentes peristomii 16 bipartitos cruribus transversim connexis observavi.

86. *BARBULA LEUCOSTOMA*, caule subsimplici, foliis ovato-lanceolatis mucronulatis integerrimis, capsula cylindracea erecta, operculo conico, peristomii dentibus obliquis apice tortis.

DESC. *Muscus cæspitosus*, semuncialis. *Caules* breves, dense foliati, sæpius indivisi, quandoque parum ramosi. *Folia* muerone brevissimo, minute areolata, marginibus anguste revolutis, nervo valido, siccitate adpressa et parum torta. *Seta* caule longior, lævis, fusca. *Capsula* lævis, æquilatera. *Operculum* conicum, acutum, paulo inclinans, capsula dimidio brevius, tenuissimè spiraliter striatum. *Peristomium* album, dentibus 32, filiformibus, per paria approximatis, dimidioque inferiore trabeculis connexis, supra distinctis, apicibus parum tortis. *Calyptra* lævis.

Obs. Inter Barbulam et Didymodon media.

87. *SYNTRICHIA RURALIS*, *Web. et Mohr tasch.* p. 215.
Voit mus. herbip. p. 52. *Brid. mant.* p. 98.

Tortula ruralis, *Smith brit.* 3, p. 1254. *Engl. bot.* 2070.
Turner musc. hibern. p. 50. *Sw. musc. suec.* p. 39.
Schwaegr. suppl. 1, *sect.* 1, p. 137. *Wahlenb. carpat.* p. 338. *Musc. brit.* p. 31, *t.* 12. *Hooker scot. par.* 2, p. 127. *Richardson in Franklin's journ.* p. 755.

Barbula ruralis, *Hedw. sp. musc.* p. 121. *Wahlenb. lapp.* 318.

Obs. Specimina duo tantum et sine fructificatione.

88. *SYNTRICHIA MUCRONIFOLIA*, caule ramoso, foliis ovato-oblongis siccitate adpressis : pilo integerrimo latitudine folii breviore, capsula cylindracea inæquilatera erecta duplo longiore ; operculo subulato-conico.

Tortula mucronifolia, *Schwaegr. suppl.* 1, *sect.* 1, p. 136, *t.* 35 ? *Wahlenb. lapp.* p. 317 ?

DESC. *Muscus v. cæspitosus v. aliis intermistus*. *Caules* erecti, breves, semper ramosi, ramis fastigiatis, dense foliati. *Folia* concava, marginibus integerrimis, infra medium leviter recurvis, minute areolatis, areolis baseos paulo laxioribus, nervo valido in pilum integerrimum excurrente, madore erecto-patentibus, siccitate imbricatis adpressis nec contortis, pilo parum flexo. *Seta* capsula haud duplo longior, concolor, siccitate tortilis. *Capsula* saturate castanea, lævis. *Operculum* badium, per lenteni pluries augentem spiraliter striatum, dimidium capsulae vix æquans.

Peristomii membrana alba, pulchre reticulata, longior ciliis contortis. Calyptra novella tantum visa, lævis.

Obs. Syntrichia subgenus tantum esse videtur Barbulae (s. Tortulæ), cujus dentes è membrana angusta ortum ducunt; et in speciebus omnibus utriusque quas investigavi operculum spiraliter striatum est.

[exceix] De synonymis supra citatis *S. mucronifoliæ* haud omnino certus sum, figura tamen Schwaegrichenii bene respondet, et descripto Wahlenbergii in omnibus convenit nisi longitudine cuspidis foliorum inferiorum.

89. ENCALYPTA CILIATA, *Hedw.* sp. *musc.* p. 61? *Schwaegr. suppl.* 1, *sect.* 1, *p.* 59? *Smith brit.* 3, *p.* 1181? *Engl. bot.* 1418? *Wahlenb. lapp.* 311? *Musc. brit. a,* *p.* 35, *t.* 13?

Leersia ciliata, Hedw. stirp. crypt. 1, *p.* 49, *t.* 19?

Obs. Exemplaria nonnulla Encalyptæ speciei in herb. D. Sabine olim visa ad hanc, ni fallor, pertinent; posthac determinanda.

90. GYMNSTOMUM OBTUSIFOLIUM, foliis oblongo-ovatis obtusis integerrimis, capsula oblonga duplo longiore operculo conico columellæ adnato.

DESC. *Caules* ramosi, dense foliati. *Folia* concava, infra laxiusculè supra medium minutè reticulata, marginibus planis, nervo vix apicem attingenti, madore erecto-patula, siccitatem appressa et parum flexa. *Seta* fusca, lævis, caule longior. *Capsula* erecta, lævis, fusca, reticulata. *Operculum* brevè conicum, cum columella cylindracea diu cohærens.

APLODON.

CHAR. GEN. *Peristomium* simplex: *dentibus* 16, æquidistantibus, indivisis, reflexilibus. *Capsula* apophysata, erecta. *Calyptra* lævis. *Flores* terminales: *masculi* discoideo-capituliformes.

Obs. Subgenus Splachni, à quo differt solummodo den-

tibus 16 æquidistantibus, et forsitan columella capsulae maturæ inclusa. Sed quoniam axis pellucidus dentis cuiusvis compositionem ejusdem indicat, ad Systylium (quod Splachni alterum subgenus), dentibus 16, æquidistantibus, bipartitis, planè accedit; in hoc enim cohærentia operculi cum columella, ex analogia cum Gymnostomis quibusdam, pro charactere specifici tantum valoris habenda sit; et ad eandem structuram approximatio indicata est in *Splachno tenue* et *longicollo*, in quibus columella tota apice subulato persistit, quamvis ab operculo cito soluta est. Transitus ab Apłodonte ad Splachnum facilis est per *S. longicollum* (*Dicks. crypt. fasc. 4, p. 4, t. 10, f. 9*, Americæ occidentali nec *Scotiae indigenum*), cui dentes vix maniferte per paria approximati, qua nota differt à *S. tenue* valde affine sed dentibus geminatis reflexilibus instructo. Ad Aplodontem proxime accedit Weissia *Splachnoides Schwaegr.* (*CYRTODON nob.*, alterum subgenus *Splachni* quasi constituens), diversa præsertim dentibus erectis apicibus incurvis, ideoque *S. Frælichiano* dentibus erectis sed geminatis affinis.

91. APLODON WORMSKIOLDII.

Splachnum Wormskoldii, Hornem. in Flor. Dan. 1659.
Schwaegr. suppl. 2, sect. 1, p. 27, t. 108.

a. Folia acuminata.

[ccc]

DESC. *Muscus* læte virens, dense cæspitosus. *Caules* 1-3-unciales, innovationibus repetitis ramosi, infra tomento radicali castaneo foliisque emarcidis tecti; ramis annotinis herbaceis, viridibus, foliatis. *Folia* alterna, descendendo remotiora, læte viridia, ovato-lanceolata, acuminata, integerima, laxè reticulata, nervo tenui, ad ortum acuminis concoloris, diametrum transversum folii vix æquantis, desinenti. *Masculus Flos* discoideo-capituliformis, ramum paucifolium ejusdem cum femineo vel distincti caulis terminans; *foliis perigonialibus* caulinis subconformibus, infra conniventibus coloratis, apicibus patulis viridibus. *Antheræ* numerosæ, brevissimè pedicellatae, cylindraceæ. *Paraphyses* plures, lutescentes, articulis sursum crassioribus brevioribusque, ultimo obtuso. *Pistilla* nulla. *Femineus Flos* terminalis, masculo angustior, *foliis perichætialibus* rameis conformibus

et concoloribus. *Pistilla* 3-5; *paraphysibus* paucissimis; *antheris* nullis. *Seta* ramum fructiferum subæquans, herbacea, sæpissime viridis, etiam post lapsum operculi, quandoque demum pallide fusca. *Vaginula* laxiuscula, dilute fusca, ore nigro-castaneo, quandoque inæquali, basi pistillis abortientibus stipata. *Calyptra* glabra, lævis, subcampanulata, sed altero latere fere ad apicem usque fissa, capsulâ adultâ brevior. *Apophysis* obovata, basi vix attenuata, capsulam crassitie subæquans, nunc paulo amplior, concolor, demum pallida et alte corrugata. *Capsula* erecta, cylindraceo-obovata, lævis, castanea, stomate haud coarctato et quandoque dentibus deciduis nudo, deoperculata apophysi brevior. *Peristomium* simplex, dentibus 16, æquidistantibus, lato-subulatis, indivisis, axi longitudinali semipellicido, transversim striatis, siccitate arce reflexis, madore conniventibus, semisiccatis patulis. *Columella* capsula matura brevior, apice simplici. *Operculum* depresso-hemisphæricum, obtusissimum, altero latere stomati diutius adhærens.

$\beta.$ Folia acutiuscula.

Obs. Ab α differt, præter folia absque acumine et quandoque obtusiuscula, caulis brevioribus vix uncialibus, stomate patentiore.

Planta groenlandica inter has duas varietates quasi media, cum α . foliis acuminatis conveniens; ad $\beta.$ habitu propius accedens.

SPLACHNUM.

Linn. Hedw.

CHAR. GEN. *Peristomium* simplex: *dentibus* (reflexilibus) v. 8, geminatis (coalitione nunc indivisis): v. 4, quaternatis. *Capsula* erecta, apophysata. *Calyptra* glabra, lævis. *Flores* terminales: *masculi* (cum v. absque pistillis sterilibus), discoideo-capituliformes.

Obs. In *S. octoblepharo* Insulæ Diemeni et *magellanico* peristomium octodentatum, sed dentium striæ longitudinales

semipellucidæ eorundem compositionem indicant. In *S. angustato*, *arctico* et *propinquo* peristomii dentes quaternatim approximati et basi coadunati. Dum *S. Frælichianum*, *eeei* et forsan *Wulfenianum*, capsula inclinata et dentibus erectis à *Splachnis* genuinis distinguitur et subgenus efformat.

92. **SPLACHNUM VASCULOSUM**, Linn. sp. pl. ed. 2, p. 1572, exclus. syn. Buxb. *Hedw. stirp. crypt.* 2, p. 44, t. 15, optime, *Sp. musc.* p. 53. *Schkuhr deut. moos.* p. 41, t. 17, iconè à supra citata *Hedwigii* mutuata. *Schwaegr. suppl.* 1, sect. 1, p. 51. *Wahlenb. lapp.* p. 308. *Musc. brit.* p. 21, t. 31, bene. *Hooker scot. par.* 1, p. 125.

DESC. *Caules* innovando subramosi, unciales, laxe foliati, inferne fibras purpureas ramosas supra-axillares nonnullas exserentes. *Folia* alterna, orbiculato-ovovata, obtusissima, parum concava, basi angustata, semiamplexicaulia, marginibus integerrimis planis, nervo mox infra apicem evanescenti; *perichætialia* similia, intimis 2-3 exceptis minoribus ovatis acutiusculis. *Seta* caulem subæquans, castanea, lævis. *Vaginula* basi stipata pistillis pluribus abortivis. *Apophysis* subsphærica vel obovata, capsula duplo amplior, semisiccata rugosa, nigro-fusca. *Capsula* cylindracea, lævis, minute reticulata, fusca. *Peristomium* dentibus 16, per paria approximatis, saepiusque ad medium, quandoque fere ad apicem, connatis, singuli axi pelluentiori tenuissimo, omnes è basi angusta annulari orti, arcte reflexiles dorso capsulæ appressi. *Columella* cylindracea, longitudine thecæ, apice dilatato, plano-depresso. *Masculi Flores* caulem distinctum paucifolium ejusdem cæspitis terminantes, capitato-discoidei; *foliis perigonialibus* extimis obtusiusculis, interioribus longioribus, è basi latiore lutescenti conniventi patulis, lanceolatis apice angustatis, integerrimis. *Antheræ* numerosæ, viginti plures. *Paraphyses* numerosissimæ, antheris longiores, subclavatæ, articulis superioribus crassioribus brevi-oribusque. *Pistilla* nulla.

Obs. Ab exemplaribus in Scotiæ montibus à D. Hooker lectis hoc paulo tantum differt foliis remotioribus et seta longiore.

93. *SPLACHNUM ARCTICUM*, peristomii dentibus quaternatim approximatis, apophysi obconica capsula clausa angustiore deoperculata latiore, operculo conico-hemisphærico, floribus masculis sessilibus, seta perichaetium bis superante, foliis ovato-lanceolatis concavis cuspidatis integerrimis.

Desc. *Muscus* dense cæspitosus. *Caules* innovationibus ramosi, sesquiunciales, infra foliis vetustis emarcidis tomento que radiculoso copioso tecti. *Rami* annotini læte virides, foliati, basin versus foliis rarioribus et brevioribus. *Folia* lanceolata-ovata, concava, integerrima, cuspidata, cuspide concolori fere $\frac{1}{2}$ longitudine laminæ, laxe reticulata, læte viridia. *Femineus Flos* gemmiformis, angustus. *Pistilla* 3-5, filis succulentis, paucis, hyalinis; *staminibus* nullis. *Seta* longitudine fere rami annotini, parum angulata, lœvis, castanea, capsula tota, apophysi simul sumpta, duplo longior. *Capsula* vera cylindracea, lœvis, nigro-castanea, ore dilatato, patulo. *Apophysis* obconica basi attenuata, capsula paulo longior. *Operculum* madore conicum, siccitate conico-hæmisphæricum mucronulo manifesto. *Peristomium* intra marginem membranæ exterioris, ubi desinet interior, ortum: *dentibus* 16, quaternatim ad medium usque connatis, singulis absque stria longitudinali manifesta. *Masculus Flos* cum femineo collateralis, ramum terminans, discoideo-capituliformis, semper sessilis, etiam dum femineus, primo pariter sessilis, ^{ccciiij} florescentia peracta ramulo suo proprio elongato insidet. *Folia perigonialia* è basi lanceolatâ erectâ in cuspidem basi longiore, subulatam producta. *Antheræ* numerosæ viginti circiter, levissime arcuatæ, brevissime pedicellatæ. *Paraphyses* stramineæ, sursum incrassatae articulis brevioribus crassioribusque. *Pistilla* nulla.

Obs. Facies omnino S. mnioidis, quocum pluribus notis convenit, satis diversum dentium dispositione.

94. *SPLACHNUM PROPINQUUM*, peristomii dentibus basi quaternatim cohærentibus, apophysi obconica capsula operculata paulo latiore, operculo siccitate depresso mutico, floribus masculis brevè pedunculatis, seta perichaetium vix superante, foliis ovatis concavis cuspidatis integerrimis.

Desc. *Cæspites* densi. *Caules* innovando divisi, unciales.

Folia viridissima, acumine subulato-setaceo, concolori, longitudine $\frac{1}{3}$ folii. *Seta* foliis floralibus paulo longior, angulata, lævis, capsulam cum apophysi sumptam vix superans. *Capsula* cylindracea, brevis, ore dilatato. *Apophysis* primo viridis, mox fusca, capsulâ ante lapsum operculi paulo tantum crassior, demum nigricans, pyriformis, capsula deoperculata concolori fere duplo amplior. *Operculum* conico-hemisphæricum, muticum, siccitate planiusculo-depressum. *Peristomii dentes* 16, quaternatim approximati et ad medium usque cohaerentes, singuli absque stria longitudinali manifesta. *Columella* crasso-cylindracea, pulposa, apice hemisphærico cavitatem operculi replenti. *Masculus Flos* capitato-discoideus, ramulum brevem, femineo collateralem, terminans, antheris paraphysibusque numerosis, pistillis certe nullis.

Obs. Proximum *S. arctico*, an ejusdem varietas?

95. SPLACHNUM EXSERTUM, capsula interiore soluta siccitate semiexserta; exteriore ore dilatato, apophysi obconica capsula (concolori) angustiore, foliis lanceolato-ovatis acuminatis integerrimis.

Desc. *Caules* annotino-ramosi; *Folia* omnino *S. arctici* et propinquai. *Masculus Flos* capitato-discoideus, ramulum distinctum, femineo breviorem, foliatum, ejusdem caulis terminans, foliis perigonialibus basi lutescentibus, acumine brevi viridi. *Antheræ* paucæ, cylindracea, leviter arcuatæ: *paraphysibus* numerosis sursum crassioribus: *pistillis* nullis. *Seta* terminalis, perichætium vix superans, dilute fusca, lævis. *Capsula* cum apophysi sumpta turbinata; *theca exterior* obovata; *interior* pedicello insidens libera, demum exsiccatione exterioris exserta. *Peristomium: dentes* 16, mox intra marginem capsulæ exterioris orti, primo quaternatim basi cohaerentes, demum quaternatim vel quandoque geminatim reflexi.

Obs. Muscus valde affinis hinc *S. arctico* et propinquo inde *paradoxo*; et hi omnes adeo approximati præsertim figura et textura foliorum ut varietates unius ejusdemque speciei forsan considerari possunt.

96. **SPLACHNUM PARADOXUM**, capsula adulta absque sutura operculi (dемum separabilis ?) ; interiore pedicellata, apophysi attenuata capsula angustiore, foliis lanceolato-ovatis acuminatis integerrimis.

^{cccciiij} DESC. *Caules* vix semunciales, innovationibus ramosi. *Folia* ovato-lanceolata, concaviuscula, carinata, laxe reticulata, integerrima, acumine subulato diametrum transversum folii subæquanti, demum decolori pilum referenti. *Masculi Flores* discoideo-capituliformes, terminantes ramos proprios pedunculiformes, paucifolios, foliolis nanis alterniis : *folia perigonalia* lanceolata, basi conniventia, apicibus patulis acuminatis. *Antheræ* numerosæ, cylindraceæ, levissime incurvæ. *Paraphyses* numerosæ, subclavatæ. *Flos femineus* terminalis. *Seta* fusca, lævis, caule longior. *Capsula* erecta, oblongo-ovovata, basi in apophysin obconicam seipsa angustiorem et breviorem attenuata, lævis, per lentem pluries augentem punctis minutis longitudinaliter seriatis, depresso, aduersus lucem semipellucidis tenuissime quasi striata, absque operculo ejusve ulla indicatione, apiculo obtuso paulo constricto. *Theca vera* dimidiata superiore tantum capsulæ exterioris occupans, pedicello cylindraceo, ex apice apophysis derivato, insidens, libera, ad ortum dentium desinens ibique cum capsula exteriore confluens. *Dentes* 16, quaternatim ad medium cohærentes, subulati, pallide fusci, apicem cavitatis capsulæ attingentes. *Semina* minutissima, in cumulo olivaceo-viridia, seorsim hyalina, lævia.

Obs. Hæc omnia è specimine unico cum capsulis 8 maturis plenis et duabus vetustis vacuis pariter clausis, varietatem nanam S. arctici referente, desumpta sunt. Exemplaria dein plura varietatis, ut videtur, ejusdem Musci, in herbario D. Richardson, inter Fort Enterprise et mare arcticum lecta, et cum S. mnioidi Schwaegr. in Franklin's journ. p. 755 (non Hedwigii), intermixta inveni : horum capsulæ adultæ numerosæ cinnamomeo-fuscæ, clausæ et absque sutura vel ulla alia operculi indicatione. In hac varietate $\beta.$, quæ statura major et calyptra dimidiata donata, seta longior quam in $\alpha.$ dentesque 16 subæquidistantes et fere ad basin distincti.

E duplicis varietatis hisce speciminibus diu in animo fuit proponere novum genus sub nomine CRYPTODONTIS, ob capsulam operculo destitutam dentibus verò inclusis instru-tam: sed omnibus iterum examini subjectis capsulam unam alteramve vetustam operculo delapso et peristomio dentato, in eodem cæspite cum clausis, et quantum determinare licuit ad eandem speciem pertinentem, observavi, ideoque ad *Splachnum*, haud tamen absque dubitatione, museum paradoxum demum retuli. In *Splachneis* autem, præter annuli defectum in tota tribu, approximationes nonnullæ ad capsulam clausam occurunt, scilicet in *Aplodonte* ubi operculum cum altero latere stomatis diutius cohæret, et in *Systylio* in quo cum columella cohærens persistit: nec transitus difficilis à *Splachneis* ad *Voitiam* habitu et statione iisdem bene convenientem.

VOITIA.

Hornschatz comment. de voit. et syst. p. 5. Hooker musc. exot. 97. Nees. v. Esenb. et Hornsch. bryol. germ. 1, p. 79. Schwaegr. suppl. 2, sect. 1, p. 2. Greville et Arnott in Wern. soc. transact. 4.

CHAR. GEN. *Capsula* clausa (absque operculo dentibusve inclusis), rostrata. *Calyptra* dimidiata, capsula adulta longior, tardius decidua. *Flores* terminales: *masculus* femineo collaterali subconformis.

Obs. Genus à *Phasco* ægre distinguendum, habitu ^{æcciv} quamvis necnon statione valde diversum, et ad *Splachneas* mediante *S. paradoxo* (s. *Cryptodonti*) accedens. *Calyptra* multo amplior equidem et diutius remanens quam in *Phasco*, sed demum decidua, nec persistens. *Vaginula* in *V. hyperborea* certe indivisa, nec candem bivalvem neque fissam in exemplaribus paucis *V. nivalis* à nobis investigatis observare licuit. In utraque specie ejusdem margo manifeste inæqualis et sublacea, sed eandem fere structuram in *Phascis* quibusdam, præsertim in *P. bryoidi* et *curvicollo*, observavimus. *Capsula* cum seta sua elongata saepè decidua sed quandoque nec raro vel cum eadem persistens, vel à seta

persistenti decidens : et seta minime post lapsum capsulæ in Phascis omnibus persistit. *Membrana interna* libera, cum processu subulato, rostrum capsulæ penetranti, in P. bryoidi et curvicollo pariter exstat : et florum dispositio subsimilis in Phascis nonnullis obtinet. *Semina* minutissima affinitatem Voitiæ cum Cryptodonti potius quam Phasco indicant.

Voitia vogesiana *Nestl.* dubia hujus generis species mihi videtur, et habitu Phascis nonnullis, præsertim P. flexuoso *Schwaegr. suppl. 2, sect. 1, p. 1, t. 101,* convenit : à Voitia diversa floribus sæpe dioicis, masculorum forma, capsulis basi in apophysin angustiorem attenuatis, seminibus majusculis, et forsitan magnitudine proportionali calypræ à me nondum visæ.

97. VOITIA HYPERBOREA, capsula globoso-ovata basi subtruncata, foliis dilatato-ovatis acuminatis.

Voitia hyperborea, *Greville et Arnott in Wern. soc. mem. 4, tab. 7, f. 19, capsula, et 21, folium.*

DESC. *Muscus cæspites densos* sæpius efformat, raro aliis, *Splachnis* præsertim, intermixtus. *Caules* 6-9-lineas longi, tomento radicali inferne arcte cohærentes, innovationibus subramosi, basi foliis-vetustis tomentoque radicali rufo-castaneo copioso tecti ; ramis annotinis dense foliatis eradiculosis. *Folia* late ovata, modice concava, integerrima, acumine è nervo valido producto formato, $\frac{1}{4}$ longitudinis folii æquante, sed concolori nec nisi vetustate canescenti pilumque referenti, laxiuscule reticulata, areolis rectangularis, invicem inæqualibus sed per totam folii longitudinem uniformibus, marginalibus vix majoribus, madore erecta, sicciitate subappressa. *Perichætia* paulo majora, acumine proportionatim longiore. *Vaginula* cylindracea, basi pistillis paucis abortivis stipata, indivisa, nec fissa nec bivalvis, apice membranaceo inæquali lacero. *Seta* elongata, caulem totum æquans v. parum superans, laevis, castanea, siccitate tortuosa. *Capsula* erecta, castanea, laevis, dilatato-ovata, basi transversa subtruncata, rostro apicis inclinato longitudine dimidii capsulæ, absque operculo ejusve omni vestigio : *exterior* coriacea, minute reticulata, areolis quadratis ;

interior ab exteriore libera, centro baseos umbilicatae affixa, apice clauso processu subulato longitudine rostri exterioris, pallida, tenuè membranacea, utrinque levigata nec intus septis processibus inæqualis. *Columella* angulata subtetragona, longitudine capsulae interioris. *Semina* minutissima, Phasci bryoidis decies fere minora, in cumulo viridia, separatim hyalina, subglobosa, per lentem centies augmentum striis nonnullis insignita, sed simplicia nec divisibilia. *Masculus* *Flos* ramulum proprium, brevissimum, femineo collateralem hoc vero post fecundationem elongato demum quasi lateralem terminans, discoideo-gemmiformis, femineo sub- [cccc] similis, foliis perigonialibus perichaetalibus conformibus. *Antheræ* numerosæ, cylindraceæ, leviter arcuatæ. *Paraphyses* copiosæ, articulis superioribus sensim crassioribus et brevioribus.

Obs. Valde affinis Voitiae nivali quæ differt capsula oblongo-ovata basi acuta, foliis elongato-ovatis laxioribus, statura majori.

HEPATICÆ.

98. JUNGERMANNIA MINUTA, Schreb. in Crantz grönl. forts. p. 285. Dicks. fasc. 2, p. 13. Wahlenb. lapp. p. 393. Hooker brit. junger. t. 44. Engl. bot. 2231.

Jungermannia bicornis, Flor. Dan. 888, f. a. Schwaeogr. prodr. hepat. p. 27. Richardson in Franklin's journ. p. 757.

Obs. Planta nostra, cuius exemplaria per pauca et fructificatione destituta tantum visa, media quasi inter *J. minutam* et *ventricosam*, ab utraque foliis explanatis, nec margine inferiore induplicatis, differt.

99. MARCHANTIA POLYMORPHA, Linn. sp. pl. ed. 2, p. 1603. Flor. lapp. n. 422. Wahlenb. lapp. p. 397. Schmid. ic. p. 106, t. 29. Engl. bot. 210. Hooker scot. par. 2, p. 119. Mich. am. 2, p. 277. Br. in Flind. voy. 2, p. 593. (Ante, p. 69.) Richardson in Franklin's journ. p. 757.

LICHENOSÆ.

100. GYROPHORA PROBOSCIDEA, *Achar. syn. p. 64.*
Engl. bot. 2484. Hooker scot. par. 2, p. 41.

Gyrophora proboscidea β, *Richardson in Franklin's journ. p. 758, tab. 30, f. 4.*

Gyromium proboscideum, *Wahlenb. lapp. p. 483.*

Obs. In nostra planta pagina inferior, quæ semper lœvis fibrillisque destituta, sæpius cinerea, nunc tota atra; quandoque thallo ad ambitum cribroso G. erosæ accedit.

101. LECANORA ELEGANS, *Achar. syn. p. 182. Hooker scot. par. 2, p. 50. Richardson in Franklin's journ. p. 760.*

Lichen elegans, *Wahlenb. lapp. p. 417, Carpat. p. 373.*
Engl. bot. 2181.

102. BORRERA? AURANTIACA, thallo adscendentí aurantiaco tereti-compresso nudo subdichotomo basi pallido: ramulis ultimis brevissimis obtusis.

Obs. Affinis B. flavicanti *Achar. l. c.*, utraque thallo teretiusculo fruticuloso à reliquis diversa. In hac Apothecia ignota ideoque dubii generis est.

103. CETRARIA JUNIPERINA, *Achar. syn. p. 226.*

eevi] *Obs.* Vix omnino cum C. juniperinâ quadrant specimina nostra quibus laciniæ crenatæ nec erosæ, margines pulvere destitutæ, discus lœvis vix manifeste lacunosus, et paginæ, quæ citrinæ, concolores.

104. CETRARIA NIVALIS, *Achar. syn. p. 228. Hooker scot. par. 2, p. 57. Br. in Ross' voy. 2 ed. v. 2, p. 195. (Antè, p. 178.) Spitz. pl. in Scoresby's arct. append. p. 76. (Antè, p. 181.) Richardson in Franklin's journ. p. 761.*

Lichen nivalis, *Linn. lapp. n. 446, t. 11. f. 1. Soland. in Phipps' voy. p. 203. *Wahlenb. lapp. p. 433, Carpat. p. 379. Engl. bot. 1994. Svensk bot. 384.**

105. CETRARIA CUCULLATA, *Achar. syn.* p. 228. *Richardson in Franklin's journ.* p. 761.

Lichen cucullatus, *Smith in Linn. Soc. transact.* 1, p. 84, t. 4, f. 7. *Wahlenb. lapp.* p. 433, *Upsal.* p. 413, *Carpat.* p. 379.

106. CETRARIA ISLANDICA, *Achar. syn.* p. 229. *Hooker scot. par.* 2, p. 58. *Br. in Ross' voy. ed.* 2, *vol.* 2, p. 195. (*Antè*, p. 178.) *Richardson in Franklin's journ.* p. 761.

Lichen islandicus, *Linn. sp. pl. ed.* 2, p. 1611. *Flor. Dan.* 155. *Engl. bot.* 1330. *Svensk. bot.* 34. *Wahlenb. lapp.* p. 434, *Carpat.* p. 379, *Upsal.* p. 413. *Soland. in Phipps' voy.* p. 203.

Phycia islandica, *Mich. am.* 2, p. 326.

107. CETRARIA ODONTELLA, *Achar. syn.* p. 230.

Lichen odontellus, *Wahlenb. lapp.* p. 434.

108. PELTIDEA APHTHOSA, *Achar. syn.* p. 238. *Wahlenb. lapp.* p. 446, *Carpat.* p. 380. *Svensk bot.* 318. *Hooker scot. par.* 2, p. 60. *Richardson in Franklin's journ.* p. 761.

Lichen aphthosus, *Linn. sp. pl. ed.* 2, p. 1616. *Engl. bot.* 1119. *Wulfen. in Jacqu. coll.* 4, p. 266, t. 17.

109. CORNICULARIA OCHROLEUCA, *Achar. syn.* p. 301. *Hooker scot. par.* 2, p. 69. *Richardson in Franklin's journ.* p. 762.

Usnea ochroleuca, *Hoffm. pl. lichen.* 2, p. 7, t. 26, f. 2.

Lichen ochroleucus, *Wahlenb. lapp.* p. 438, *Carpat.* 382. *Engl. bot.* 2374.

110. CORNICULARIA LANATA, *Achar. syn.* p. 302. *Hooker scot. par.* 2, p. 69.

Lichen lanatus, *Linn. sp. pl. ed.* 2, p. 1623. *Engl. bot.* 846. *Wahlenb. lapp.* p. 440, *Carpat.* p. 383.

Lichen normöricus, *Gunn. norv. par.* 2, p. 123, t. 2, f. 9—14.

111. CERANIA VERMICULARIS, *Achar. syn.* p. 278. [cccvii]

Cenomyce? vermicularis, *Hooker scot. par. 2, p. 65.*
Richardson in Franklin's journ. p. 762. Br. in Flinders' voy. 2, p. 594. (Antè, p. 69.)

Bœomyces vermicularis, *Wahlenb. lapp. p. 458.*

Cladonia subuliformis, *Hoffm. pl. lichen. 2, p. 15, t. 29, f. 1—3.*

Lichen vermicularis, *Dicks. crypt. fasc. 2, p. 23, t. 6, f. 10. Engl. bot. 2029.*

Obs. Apothecia (?) lateralia, sparsa, atra, thallo innata eoque submarginata, apotheciis Roccellæ aliquo modo accendentia, in exemplaribus nonnullis à D. Fisher lectis, observavi.

112. CENOMYCE PYXIDATA, *Achar. syn. p. 252.*

113. STEREOCAULON PASCHALE, *Achar. syn. p. 284.*
Mich. am. 2, p. 331. Br. in Flinders' voy. 2, p. 594.
(Antè, p. 70.) Spitzb. pl. in Scoresby's arct. 1, append. p. 76. (Antè, p. 181.) Giesecke Greenl. in Edin. encyclop. Hooker scot. par. 2, p. 66. Richardson in Franklin's journ. p. 762.

Bœomyces paschalis, *Wahlenb. lapp. p. 450, Carpat. p. 386.*

Lichen paschalis, *Linn. sp. pl. ed. 2, v. 2, p. 1621.*
Soland. in Phipps' voy. p. 204.

Lichen ramulosus, *Sw. fl. ind. occid. 3, p. 1917.*

114. USNEA SPHACELATA, thallo erectiusculo fruticuliformi, ramis primariis ochroleucis nigro-vittatis lœvibus: ultimis attenuatis nigris, sorediis confertis concoloribus ochroleucisve.

Usnea? prope melaxantham, *Br. spitzb. pl. in Scoresby's arct. 1, append. p. 76. (Antè, p. 181.)*

Obs. Proxima U. melaxanthæ Ach. *syn. p. 303,* differt statura aliquoties minore, ramis primariis lœvibus, sorediorum præsentia. Apothecia nondum visa. Eandem speciem, sorediis pariter instructam apotheciisque destitutam, in summitate Montis Tabularis Insulæ Van Diemen, anno 1804, legi.

FUNGI.

115. *CANTHARELLUS LOBATUS*, *Fries.* *syst. mycolog.* 1,
p. 323.

Helvella membrancea, *Flor. Dan.* 1077, *f.* 1.

116. *LYCOPERDON PRATENSE*, *Pers. syn. fung.* *p.* 142.

Præter plantas supra enumeratas, species nonnullæ in herbariis citatis exstant, scilicet Muscorum quinque, Leidiæ v. Leprariae unica, et Agarici tres: has vero è speciminibus vel fructificatione destitutis vel male exsiccatis haud determinare potui.

Algæ submersæ prorsus nullæ reportatae fuere.

Species quæ Florulæ Melvillianæ adhucdum propriæ ^{ccccviii} remanent sequentes sunt.

Ranunculus Sabinii, qui nivali nimis affinis.

Ranunculus affinis, proximus *auricomus*.

Draba pauciflora, valde dubia species.

Platypetalum dubium, cuius flores ignoti.

Sieversia Rossii, proxima *S. humili* Oonalashkæ indigena.

Tussilago corymbosa, valde affinis *T. frigidæ*.

Pedicularis arctica, prope *P. sudeticam* et *Langsdorfii*.

Dupontia Fisheri, graminis nulli cognito affinis.

Barbula leucostoma, quæ species distincta videtur.

Gymnostomum obtusifolium, species insignis, sed non satis cognita.

Splachnum arcticum, proximum *S. mnioidi*.

Borrera aurantiaca, Lichenosa distincta, sed dubii generis.

Genus itaque Insulæ Melville peculiare nullum restat nisi *Dupontia*, si hoc equidem servari meretur.

Aliquas observationes, species nonnullas Florulæ Melvillianæ illustrantes, derivatas ex herbarii inspectione ad litora orientalia Americæ arcticæ, inter grad. 66 et 70 lat., in novissima navigatione duce D. Parry, formati à D. Ross, cuius amicitiae specinina totius collectionis debeo, hic sub-jungere licet ; ordine Florulæ servato numerisque specierum præfixis.

11. PLATYPETALUM PURPURASCENS.

Siliculæ v. ovali-oblongæ v. oblongæ, glabræ v. pilis rarib. brevibus simplicibus bifidisque conspersæ, *stigmate* quandoque capitato emarginato, nec semper bilobo lobis patentibus, *coronatæ*; *valvulis* aveniis, ecarinatis, planiusculis; *dissepimento* rarius fenestrato. *Semina* biseriata. *Cotyledones* incumbentes, angusto-oblongæ, rectæ nec basibus crus radiculare embryonis occupantibus.

Platypetalum itaque hinc *Subulariæ* affine inde *Eudemæ*, hæc vero differt stylo elongato, dissepimento semper fenes-trato, et forsitan aliis notis è floris examini accuratiore deri-vandis.

13. EUTREMA EDWARDSII.

Herba quandoque 4-6-uncialis.

18. STELLARIA EDWARDSII.

Exemplaria omnia ad var. *a* pertinent, foliis ovatis acutis caulinibusque glaberrimis, pedunculis unifloris, antheris purpureis, capsulis erectis semisexvalvibus calycem vix superantibus, seminibus lævibus fuscis.

Species forsitan polygama, ad quam referenda S. Edwardsii *Richardson l. c.?* et S. nitida *Hooker?*

cccix] 26. SAXIFRAGA UNIFLORA.

Exemplaria omnia staturæ majoris sunt, et pleraque caulinibus 2-3-floris donata; ideoque hæc, quæ potius pro varietate insigni quam distincta specie supra proposita fuit, ad S. cæspitosam absque dubio reducenda.

36. OXYTROPIS ARCTICA.

Hujus varietas notabilis, vix enim distincta videtur species, statura minore, scapo saepe unifloro passimque umbella biflora, dentibus calycis respectu tubi paulo longioribus, foliolis saepius 7, quandoque 9, villis persistentibus utrinque argenteo-sericcis.

CINERARIA CONGESTA.

Herba quandoque spithamea, folia saepius sinuato-dentata, nunc alte sinuata, passim indivisa; haec exemplaria itaque propius *C. palustri* accedunt, inflorescentia densiore, lana magis copiosa et longiore praesertim distinguenda.

50. CAREX MISANDRA.

Hujus exemplaria aliqua completa, 6-9-uncialia, foliis linearibus apice attenuato, marginibus deorsim scabris, culmo laevi, spicis 3-4, alternis, raro subumbellatis, terminali basi solum rariusve tota mascula, stigmatibus saepissime tribus. Hinc ad *C. fuliginosam* Sternb. l. c. procul dubio referenda.

51. CAREX CONCOLOR.

Specimina proceriora, spicis femineis longioribus, axi squamarum pallido, ad *C. cæspitosam* propius accedunt, et culmo laevi præcipue distingui possunt.

56. COLPODIUM LATIFOLIUM.

In exemplaribus plerisque rudimentum breve setuliforme flosculi secundi adest; necnon valvulae inferioris perianthii setula denticulata dorsalis, $\frac{1}{3}$ circiter ab ejusdem apice, nervum centralem terminans, altitudinem valvulae vix æquans. Aliqua autem omnino mutica sicut pleraque ab Insula Melville.

57. POA ANGUSTATA.

Hujus, ni fallor, varietas nana (2-3-uncialis), perianthiis glaberrimiis, locustis viridibus apicibus purpureis valvulae inferioris perianthiorum solum exceptis.

58. POA ABBREVIATA.

Specimina pleraque vix triuncialia.

60. FESTUCA BREVIFOLIA.

Triviale nomen his exemplaribus vix convenit, quibus folia radicalia dimidium et ultra culmi æquant, et culmea vaginis suis proportionatim longiora sunt.

cccx] 62. PLEUROPOGON SABINII.

Exemplar unicum cæspitosum, in palude à D. Ross lectum ad var. β pertinet, culmis partialibus quadriuncialibus, antheris purpureis.

91. APLODON WORMSKIOLDII.

Exemplaria nonnulla varietatis à supra enumeratis diversæ, cuius folia acutiuscula absque acumine, apophysis ovato-globosa, nec basi attenuata, pallidè straminea, cava, axi solido, capsulâ castaneâ amplior.

97. VOITIA HYPERBOREA.

Sæpius aliis Muscis, Splachnis præsertim, intermixta crescit.

OBSERVATIONS
ON THE
STRUCTURE AND AFFINITIES
OF THE
MORE REMARKABLE PLANTS
COLLECTED BY
THE LATE WALTER OUDNEY, M.D.,
AND
MAJOR DENHAM, AND CAPTAIN CLAPPERTON,
IN THE YEARS 1822, 1823, AND 1824,
DURING THEIR
EXPEDITION TO EXPLORE CENTRAL AFRICA.

BY
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[Reprinted from the '*Narrative of Travels and Discoveries in Northern and Central Africa*', by Major Dixon Denham and Captain Hugh Clapperton. Appendix, pp. 208—246.]

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OBSERVATIONS, &c.

THE Herbarium formed, chiefly by the late [Append. p. 208] Dr. Oudney, during the expedition, contains specimens, more or less perfect, of about three hundred species. Of these one hundred belong to the vicinity of Tripoli; fifty were collected in the route from Tripoli to Mourzuk, thirty-two in Fezzan, thirty-three on the journey from Mourzuk to Kouka, seventy-seven in Bornou, and sixteen in Haussa or Soudan.

These materials are too inconsiderable to enable us to judge correctly of the vegetable productions of any of the countries visited by the mission, and especially of the more interesting regions, Bornou and Soudan.

For the limited extent of the herbarium, the imperfect state of many of the specimens, and the very scanty information to be found respecting them, either in the herbarium itself or in the journal of the collector, it is unfortunately not difficult to account.

Dr. Oudney was sufficiently versed in botany to have formed collections much more extensive and instructive, had the advancement of natural history been the principal purpose of his mission. His time and attention, however, were chiefly occupied by the more important objects of the expedition; as a botanist he had no assistant; and the state of his health during his residence in Bornou must, in a great degree, have rendered him unable to collect or observe the natural productions of that country.

For the few specimens belonging to Soudan, we are indebted to Captain Clapperton, who, after the death of Dr.

Oudney, endeavoured to preserve the more striking and useful plants which he met with. His collection was originally more considerable; but before it reached England many of the specimens were entirely destroyed. It still includes several of the medicinal plants of the natives; but these being without either flowers or fruit, cannot be determined.

[209] In the whole herbarium, the number of undescribed species hardly equals twenty; and among these not one new genus is found.

The plants belonging to the vicinity of Tripoli were sent to me by Dr. Oudney, before his departure for Fezzan. This part of the collection, amounting to one hundred species, was merely divided into those of the immediate neighbourhood of Tripoli, and those from the mountains of Tarhona and Imsalata.

It exceeds in extent the herbarium formed by Mr. Ritchie near Tripoli, and on the Gharian hills, which, however, though containing only fifty-nine species, includes twenty-seven not in Dr. Oudney's herbarium.

The specimens in Mr. Ritchie's collection are carefully preserved, the particular places of growth in most cases given, and observations added on the structure of a few; sufficient at least to prove, that much information on the vegetation of the countries he visited might have been expected from that ill-fated traveller.

In these two collections united, hardly more than five species are contained not already published in the works that have appeared on the botany of North Africa; particularly in the 'Flora Atlantica' of M. Desfontaines, in the 'Flore d'Egypte' of M. Delile, and in the 'Floræ Libycæ Specimen' of Professor Viviani, formed from the herbarium of the traveller Della Cella.

The plants collected in the Great Desert and its oases, between Tripoli and the northern confines of Bornou, and which somewhat exceed a hundred, are, with about eight or ten exceptions, also to be found in the works now mentioned. And, among those of Bornou and Soudan, which fall short of one hundred, very few species occur

not already known as natives of other parts of equinoctial Africa.

A complete catalogue of the herbarium, such as I have now described it, even if the number and condition of the specimens admitted of its being satisfactorily given, would be of but little importance, with reference to the geography of plants. Catalogues of such collections, if drawn up hastily, and from imperfect materials, as must here have been the case, are indeed calculated rather to injure than advance this department of the science, which is still in its infancy, and whose progress entirely depends on the scrupulous accuracy of its statements. To produce confidence in these statements, and in the deductions founded on them, it should in every case distinctly appear that, in establishing the identity of the species enumerated, due attention has been paid to the original authorities on which they depend, and, ^[210] wherever it is possible, a comparison actually made with authentic specimens.

In the account which I am now to give of the present collection, I shall confine myself to a slight notice of the remarkable known plants it contains, to characters or short descriptions of the more interesting new species, and to some observations on such of the plants as, though already published, have either been referred to genera to which they appear to me not to belong, or whose characters require essential alteration.

In proceeding on this plan, I shall adopt the order followed in the botanical appendix to Captain Tuckey's 'Expedition to the River Congo.' And as there will seldom be room for remarks on the geographical distribution of the species I have to notice, I shall chiefly endeavour to make my observations respecting them of some interest to systematic botanists.

CRUCIFERÆ. Fifteen species belonging to this family exist in the collection, one of which only appears to be undescribed, and of this the specimens are so imperfect that its genus cannot with certainty be determined. Of those already published, however, the generic characters of

several require material alterations, some of which suggest observations relative to the structure and arrangement of the natural order.

SAVIGNYA AEGYPTIACA (*De Cand. Syst.* 2, p. 283) is the first of these. It was observed near Bonjem by Dr. Oudney, whose specimens slightly differ from those which I have received from M. Delile, by whom this plant was discovered near the pyramid of Saqqârah, and who has well figured and described it in his '*Flore d'Egypte*,' under the name of *Lunaria parviflora*. By this name it is also published by M. Desvaux. Professor Viviani, in giving an account of his *Lunaria libyca*, a plant which I shall presently have occasion to notice more particularly, has remarked,¹ that Savignya of De Candolle possesses no characters sufficient to distinguish it as a genus from *Lunaria*; and still more recently, Professor Sprengel has referred our plant to *Farsenia*.² The genus Savignya, however, will no doubt be ultimately established, though not on the grounds on which it was originally constituted; for the umbilical cords certainly adhere to the partition, the silicule, which is never ^{211]} absolutely sessile, is distinctly pedicellated in Dr. Oudney's specimens, the valves are not flat, and the cotyledons are decidedly conduplicate. In describing the cotyledons of his plant as accumbent, M. De Candolle has probably relied on the external characters of the seed, principally on its great compression, its broad margin or wing, and on the whole of the radicle being visible through the integuments. It would appear, therefore, that the true character of the cotyledons of Savignya has been overlooked, chiefly from its existing in the greatest possible degree. To include this degree of folding, in which the margins are closely approximated, and the radicle consequently entirely exposed, a definition of conduplicate cotyledons, somewhat different from that proposed in the '*Systema Naturale*' becomes necessary. I may here also observe, that the terms *Pleurorhizæ* and *Notorrhizæ*, employed by M. De Candolle to express the two principal modifications of cotyledons in *Cruciferæ*, appear to me so far objectionable, as they may

¹ *Floræ Libycæ Specim.* p. 35.

² *Syst. Vegetab.* p. 871.

seem to imply that in the embryo of this family the position of the radicle is variable, and that of the cotyledons fixed. It is at least deserving of notice that the reverse of this is the fact; though it is certainly not necessary to change these terms, which are now generally received.

On the subject of *Savignya*, two questions naturally present themselves. In the first place—Is this genus, solely on account of its conduplicate cotyledons, to be removed from *Alyssinæ*, where it has hitherto been placed, to *Velleæ*, its affinity with which has never been suspected, and to whose genera it bears very little external resemblance? Secondly—in dividing *Cruciferae* into natural sections, are we, with M. De Candolle, to expect in each of these subdivisions an absolute uniformity in the state of the cotyledons? As far as relates to the accumbent and flatly incumbent states, at least, I have no hesitation in answering the latter question in the negative; and I believe that in one case, namely, *Hutchinsia*, these modifications are not even of generic importance, for it will hardly be proposed to separate *H. alpina* from *petræa*, solely on that ground. I carried this opinion further than I am at present disposed to do, in the second edition of Mr. Aiton's '*Hortus Kewensis*', where I united in the genus *Cakile* plants, which I then knew to differ from each other, in having accumbent and conduplicate cotyledons; and I included *Capsella bursa-pastoris* in the genus *Thlaspi*, although I was aware, both from my own observations and from Schkuhr's excellent figure,¹ that its cotyledons were incumbent. I am at present, ~~as~~ however, inclined to adopt the subdivision of both these genera, as proposed by several authors and received by M. De Candolle; but to this subdivision the author of the '*Systema Naturale*' must have been determined on other grounds than those referred to; for in these four genera, in which the three principal modifications of cotyledons occur, he has taken their uniformity for granted.

As to the place of *Savignya* in the natural family, I believe, on considering the whole of its structure and habit, that it ought to be removed from *Alyssinæ* to a subdivision

¹ *Handb. tab. 180.*

of the order that may be called *Brassiceæ*, but which is much more extensive than the tribe so named by M. De Candolle; including all the genera at present known with conduplicate cotyledons, as well as some others, in which these parts are differently modified.

There are two points in the structure of *Savignya*, that deserve particular notice. I have described the aestivation of the calyx as valvular; a mode not before remarked in this family, though existing also in *Ricotia*. In the latter genus, however, the apices of the sepals are perhaps slightly imbricate, which I cannot perceive them to be in *Savignya*.

The radicle is described by M. De Candolle as superior with relation to the cotyledons. I am not sure that this is the best manner of expressing the fact of its being horizontal, or exactly centrifugal, the cotyledons having the same direction. This position of the seed is acquired only after fecundation; for at an earlier period the foramen of the testa, the point infallibly indicating the place of the future radicle, is ascendent. From the horizontal position of the radicle in this and some other genera, especially *Farsetia*, we may readily pass to its direction in *Biscutella*, where I have termed it descendent, a character which I introduced to distinguish that genus from *Cremolobus*. But in *Biscutella* the embryo, with reference to its usual direction in the family, is not really inverted, the radicle being still placed above the umbilicus. On the contrary, in *Cremolobeæ*, a natural tribe belonging to South America, and consisting of *Cremolobus* and *Menonvillea*, though the embryo at first sight seems to agree in direction with the order generally, both radicle and cotyledons being ascendent, it is, in the same sense, not only inverted, but the seed must also be considered as resupinate; for the radicle is seated below the umbilicus, and also occupies the inner side of the seed, or that next the placenta—peculiarities which, taken together, constitute the character of the 213] tribe here proposed. It appears to me singular that M. De Candolle, while he describes the embryo of these two genera as having the usual structure of the order, should

consider that of *Iberis*, in which I can find no peculiarity, as deviating from that structure.¹

LUNARIA LIBYCA of Viviani² is the second plant of Cruciferæ on which I have some observations to offer. This species was described and figured, by the author here quoted, in 1824, from specimens collected in 1817 by Della Cella. The specimens in the herbarium were found near Tripoli, where the plant had also been observed in 1819 by Mr. Ritchie, who referred it to *Lunaria*, and remarked that the calyx was persistent. Professor Sprengel, in his 'Systema Vegetabilium,' considers it a species of *Farsetia*.

That this plant ought not to be associated either with the original species of *Lunaria*, or with *Savignya*, as now constituted, is sufficiently evident. And if it is to be included in *Farsetia*, it can only be on the grounds of its having a sessile silicule, with compressed valves, an indefinite number of seeds in each cell, and accumbent cotyledons. But in these respects it accords equally with *Meniocus*, a genus proposed by M. Desvaux, and with some hesitation received by M. De Candolle, and with *Schivereckia* of Andrzejowski, which he has also adopted.

¹ SAVIGNYA.

Savignya. *De Cand. Syst.* 2, p. 283. *Lunariae* sp. *Delile*. *Desvaux*. *Viviani*.

CHAR. GEN. *Calyx* basi æqualis; aestivatione valvata. *Silicula* oblonga, septo conformi, valvis convexiusculis. *Semina* biscriata imbricata marginata. *Cotyledones* conduplicate.

Herba annua, glabra (quandoque pubescentia simplici). Folia crassiuscula, inferiora obovata in petiolum attenuata grosse dentata, media saepe incisa, superiora linearia. Racemi oppositifolii, ebracteati. Flores parvi erecti, petalis violaceis venis saturioribus. Siliculae racemosæ, divaricatae, inferiores saepius deflexae.

Calyx erectus, aestivatione valvata, ipsis apicibus vix imbricatis. *Petala* unguiculata, laminis obovatis sub aestivatione mutuo imbricatis. *Stamina* distincta, edentula, singulum par longiorum glandula subquadrate extus stipatum; breviora, quantum e speciminiibus observare licuit, eglandulosa. *Ovarium* brevissime pedicellatum, ovulis adscendentibus nec horizontalibus. *Stylus* brevis. *Stigma* capitatum vix bilobum. *Silicula* breviter manifeste tamen stipitata, oblonga nunc oblongo-elliptica. *Valvulae* uninerviae reticulato-venosæ. *Dissepimentum* et lamellis duabus separabilibus uninerviis venis anastomozantibus obsoletis: areolis subtransversim angustato-linearibus, paricibus (tubulis) rectis subparallelis. *Funiculi* horizontales, dimidio inferiore septo arcte adnato superiore libero.

² *Flor. Lib. Specim.* p. 34, tab. 16, f. 1.

It does not, however, agree with either of those genera in habit, and it is easily distinguished from both by its simple [214] filaments and other characters, which I shall notice hereafter. Is this plant, then, *sui generis*? ought it to be united with *Alyssum*, the character of that genus being modified to receive it? or does not *Alyssum* require subdivision, and may not our plant be referred to one of the genera so formed? A brief result of the examination of these questions, so far as they are connected with the subject under consideration, will be found annexed to the character which is given of the genus formed by the union of *Lunaria libyca* with *Alyssum maritimum*, a plant also in the collection, from the neighbourhood of Tripoli.

Alyssum maritimum, which is described both as an *Alyssum* and as a *Clypeola* by Linnæus, is the *Konig* of Adanson, who founded his generic distinction on the monospermous cells and supposed want of glands of the receptacle, and M. Desvaux, admitting Adanson's genus, has named it *Lobularia*. In the second edition of 'Hortus Kewensis' I included this plant in *Alyssum*, which M. De Candolle has also done in his great work.

For the genus here proposed I shall adopt Adanson's name, altering only the termination, and wishing it to be considered as commemorating the important services rendered to Botany by my friend Mr. Konig, of the British Museum.¹ In comparing these two species of Koniga,

¹ KONIGA.

Konig. *Adans. sum.* 2, p. 420. *Lobularia*. Desvaux in *Journ. de Botan. appl.* 3, p. 172. *Alyssi* sp. *Hort. Kew. ed. 2*, vol. 4, p. 95. *De Cand. Syst. Nat.* 2, p. 318. *Lunariae* sp. *Viv. Liliyc.* p. 34. *Farsetiae* sp. *Spreng. Syst. Veg.* 2, p. 871.

CHAR. GEN. *Culyx patens. Petala integerrima. Glandulae hypogynæ 8! Filamenta omnia edentula. Silicula subovata, valvis planiusculis, loculis 1-polyspermis, funiculis basi septo (venoso, nervo deliquescenti) adnatis. Semina (sepiissime) marginata. Colyledones accumbentes.*

Herbae (*annuae v. perennes*) pubes bipartita appressa incanæ. Folia integerrima sublinearia. Racemi terminales, nunc basi foliati. Flores albi.

Calyx basi subæqualis. *Petalorum* laminæ dilatatæ. *Antheræ* ovatæ. *Glandularum* quatuor per paria filamenta longiora lateraliter adstantes; reliquæ quatuor abbreviatæ geminatim filamenta breviora stipantes. *Dissepimentum*, præter areolas ultimas (laminæ duplicitis) transversim linares parietibus (tubulis) rectis subparallelis, *venis* crebre anastomozantibus a *nervo* descendenti e duobus

their agreement is very striking in habit, in leaves, in the closely pressed bipartite pubescence, in the calyx, petals, stamens, and stigma. They correspond, also, in some other points, less obvious but equally important, which I shall separately notice. The first of these is in having eight glands on the receptacle; a character peculiar, I believe, to these plants, and which first suggested the generic name Octadenia. The glands in *Alyssum maritimum* were entirely overlooked by Adanson, are not noticed by M. Desvaux, and M. De Candolle has described only the four that subtend the longer stamens. These certainly are much more conspicuous than the remaining four, which, however, occupy the place of the only glands existing in several of the most nearly related genera.

The number and position of the glands in this genus give some support, perhaps, to the hypothesis which I have formerly advanced, of the divisions of an hypogynous disk being in most cases formed of abortive filaments; an opinion more strikingly confirmed, however, in this family of plants, by their form and texture in *Alyssum calycinum* and *minimum*.

The second point in which the two species of Koniga agree is in the structure of the septum. On this, which I consider as a new source of character in Cruciferæ, I shall offer some remarks in speaking of Farsetia.

arete approximatis formato supra basin evanescenti in monospermis obsoleto ortis descendantibus. *Funiculi* in dispermis polyspermisque in diversis loculis alterni.

OBS. Koniga ad Alyssinarum tribum *De Cand.* pertinens, hinc Alyso auctorum inde Farsetiae accedit. Sed *Alyssum*, uti in Hort. Kew. et *De Cand.* Syst. Nat. constitutum est, certe divisione eget.

ALYSSUM *nob.* facile distinguendum sequentibus notis: Silicula subrotunda, disco convexo, limbo compresso, apice retuso, loculis dispermis, funiculis basi septo adnatis et post lapsum seminum persistentibus, supra liberis et cum iisdem deciduis, in diversis loculis oppositis, in codem a styli basi equidistantibus: Petalis emarginatis: Filamentis omnibus nonnullisve appendiculatis in speciebus omnibus praeter *A. calycinum* in quo filamenta filiformia simplicia sunt et glandularum loco setulae quatuor filamenta nana æmulantes exstant.

Ad *Alyssum* sic constitutum et herbas plerumque annuas pube stellari foliisque integerrimis complectens pertinent *A. campestris* et *calycinum*, *Linn.*, *strigosum* *Russell.*, *minimum* *Willd.* et *strictum ejusd.* a quo densiflorum *Desfont.* vix differt; fulvescens *Smith*, umbellatum *Dese.* rostratum *Slev.* micro-petalum *Fisch.* hirsutum *Bieb.* aliasque species ineditas.

The third point of agreement is the adhesion of the funiculi umbilicales to the septum. This adhesion, though really existing, is not very obvious in the monospermous cells of *Koniga maritima*; but in the supposed variety of this species from Teneriffe, in which the cells are occasionally dispermous, it is manifest, and is very remarkable in all states of *Koniga libyca*.

I first introduced this adhesion of the funiculi to the septum as a generic character in distinguishing *Petrocallis* from *Draba*. It has since been advantageously employed in the character of *Lunaria* by M. De Candolle, who, however, supposes this structure of much rarer occurrence in ²¹⁶ *Cruciferæ* than it really is. According to my observations, it is neither unfrequent, nor always of generic importance. Thus, I find it to exist in some species only of *Arabis*, namely *A. Turrita*, *pendula*, and *canadensis*, and hence I did not introduce it into my generic character of *Parrya*, though I have noticed it in my description of the species.

The principal difference existing between these two species of *Koniga* is that the cells of the ovary and silicula of *K. maritima* are monospermous, while those of *libyca* are polyspermous, the number being variable, apparently indefinite, but not exceeding six. There are, however, other instances in this family, in which the mere difference between definite and indefinite number of seeds is of specific importance only, as in *Draba* and *Meniocus*, in each of which a species exists with dispermous cells; and the objection arising from the apparently still greater difference between unity and indefinite number in the two species of *Koniga* is removed by a supposed third species or variety of *K. maritima*, in which two seeds are occasionally produced in each cell. It may even be observed that from unity to the indefinite number in this case, where the ovula in the different cells are alternate, the transition is perhaps more easy than from the binary to the indefinite, in cases where, as in *Alyssum* properly so called, the ovula are placed opposite in the different cells, and are in the same cell equidistant from its apex; this symmetry, probably, admitting of addition only by fours.

The next genus of Cruciferae to be noticed is FARSETIA, a fragment of the original species of which is in the collection. There are also several specimens of a plant, found in the desert, supposed to be new, and which, though without flowers, and considerably different in the form of its stigma, I am inclined, from the resemblance in habit, in pubescence, in silicula, in seeds, and especially from the exact similarity in the structure of the septum, to refer to the same genus.¹

As the introduction of the structure of the dissepiment ^[217] into the generic characters of Cruciferae is now proposed for the first time, and as I believe that its texture and appearance should always be attended to in constituting genera in this family of plants, I shall here offer a few remarks respecting it.

According to the particular view which I briefly but distinctly published in 1818, and which M. De Candolle first adopted in 1821, of the composition of the pistillum in Cruciferae,² the dissepiment in this family is necessarily

¹ FARSETIA.

Farsetia. Turra, Farsetia, p. 5. Farsetiae sp. Hort. Kew. ed. 2, vol. 4, p. 69. De Cand. Syst. 2, p. 286.

CHAR. GEN. *Calyx clausus, basi vix bisaccatus. Filamenta omnia edentula. Antheræ lineares. Silicula ovalis v. oblonga, sessilis, valvis planiusculis, loculis polyspermis (raro 1-2-spermis), funiculus liberis. Dissepimentum uninerve, venosum. Semina marginata. Cotyledones accumbentes.*

Herbæ suffruticosæ ramosæ, pube bipartita appressa incanæ. Folia integrerrima. Racemi subspicati.

OBS. Dissepimentum in omnibus exemplaribus utriusque speciei a nobis visum completum, sed in *F. aegyptiaca* quandoque basi fenestratum, sive D. Desfontaines. (*Flor. Atlant. 2, tab. 160.*)

F. aegyptiaca species unica certa est, nam *F. stylosa*, cuius flores ignoti, ob stigmatis lobos patentibus non absque hesitatione ad hoc genus retuli.

FARSETIA? stylosa, ramosissima, siliculis oblongis polyspermis passimque brevè ovalibus 1-2-spermis, stylo diametrum transversum siliculae subæquante, stigmatis lobis patentibus.

OBS. Exemplaria omnia foliis destituta, sed illorum cicatrices si fallor obviae.

² In a work published in 1810, the following passage, which has some relation to this subject, occurs:—"Capsulas omnes pluriloculares e totidem thecis conferruminatas esse, diversas solum modis gradibusque variis cohaesioneis et solubilitatis partium judico." (*Prodr. Flor. Nov. Holl. 1, p. 558.*) This opinion, however, respecting the formation of multilocular ovaria, might be held, without necessarily leading to the theory in question of the composition of the fruit in Cruciferae, which I first distinctly stated in an essay on Compositæ, read

^{218]} formed of two lamellæ, derived from the parietes of the fruit. These lamellæ are in many cases easily separable,

before the Linnean Society in February, 1816, and printed in the twelfth volume of their 'Transactions,' published in 1818. In this volume (p. 89), I observe that "I consider the pistillum of all phænogamous plants to be formed on the same plan, of which a polyspermous legumen, or folliculus, whose seeds are disposed in a double series, may be taken as the type. A circular series of these pistilla disposed round an imaginary axis, and whose number corresponds with that of the calyx or corolla, enters into my notion of a flower complete in all its parts. But from this type, and number of pistilla, many deviations take place, arising either from the abstraction of part of the complete series of organs, from their confluence, or from both these causes united, with consequent abortions and obliterations of parts in almost every degree. According to this hypothesis, the ovarium of a syngenesious plant is composed of two confluent ovaria, a structure in some degree indicated externally by the division of the style, and internally by the two cords (previously described), which I consider as occupying the place of two parietal placentæ, each of these being made up of two confluent chordulæ, belonging to different parts of the compound organ."

In endeavouring to support this hypothesis by referring to certain natural families, in which degradations, as I have termed them, are found, from the assumed perfect pistillum to a structure equally simple with that of Compositæ, and after noticing those occurring in Goodenoviae, I add, "The natural order Cruciferæ exhibits also obliterations more obviously analogous to those assumed as taking place in syngenesious plants; namely, from a bilocular ovary with two polyspermous parietal placentæ, which is the usual structure of the order, to that of *Isatis*, where a single ovulum is pendulous from the apex of the unilocular ovary; and, lastly, in the genus *Bocconia*, in the original species of which (*B. frutescens*), the insertion of the single erect ovulum has the same relation to its parietal placentæ, as that of Compositæ has to its filiform cords, a second species (*B. cordata*) exists, in which these placentæ are polyspermous."

From this quotation it is, I think, evident, that in 1818 I had published, in my essay on Compositæ, the same opinion, relative to the structure of the pistillum of Cruciferæ, which has since been proposed, but without reference to that essay, by M. De Candolle, in the second volume of his 'Systema Naturae,' and I am not aware that when the essay referred to appeared, a similar opinion had been advanced by M. De Candolle himself, or by any other author; either directly stated of this family in particular, or deducible from any general theory of the type or formation of the pistillum. I am persuaded, however, that neither M. De Candolle, when he published his 'Systema,' nor M. Mirbel, who has very recently adverted to this subject, could have been acquainted with the passage above quoted. This, indeed, admits of a kind of proof; for if they had been aware of the concluding part of the quotation, the former author would probably not have supposed that all the species referred to *Bocconia* were monospermous (*Syst. Nat.* 2, p. 89); nor the latter that they were all polyspermous. (*Mirbel in Ann. des Scien. Nat.* 6, p. 267). Respecting *Bocconia cordata*, though it is so closely allied to *Bocconia* as to afford an excellent argument in favour of the hypothesis in question, it is still sufficiently different, especially in its polyspermous ovarium, to constitute a distinct genus, to which I have given the name (*MACLEAYA cordata*) of my much valued friend Alexander Macleay, Esq., Secretary to the Colony of New South Wales, whose merits as a general naturalist, a profound entomologist, and a practical botanist, are well known.

and where their union is more intimate, their existence is still evident from the want of correspondence, and consequent decussation of their areolæ. The lamellæ, which are usually very thin and transparent, have their surface divided into areolæ, in different genera of very different forms, some of which may, with sufficient clearness, be described. In many cases, no other appearance exists; in some, however, the axis of the septum resembles either a single nerve, or two distinct parallel nerves; and from this axis, whether formed of one or two nerves, tubes having the appearance and ramification of the veins of a leaf, and which generally terminate within the margin, not unfrequently proceed. This is remarkably the case in *Farsetia*, as I here propose to limit that genus; the central vessels in both its species being closely approximated, so as to form a single cord, extending from the apex to the base of the septum, and the veins being numerous and uncommonly distinct. Approaches more or less manifest to this structure of *Farsetia* exist in several other genera, as in *Parrya*, *Savignya*, and *Koniga*. But in this last-mentioned genus ²¹⁹ the nerve, which originates, as in all cases, at the apex, hardly extends, even in the polyspermous species, beyond the middle of the septum, and the veins which are much less distinct, are descendent.

As far as my observations on this subject at present extend, I expect, with great confidence, uniformity in the structure of the septum of strictly natural genera, and in many cases, though certainly not in all, I have found a resemblance in this respect in more extensive groups. Thus *Draba*, *Arabis*, and *Aubrieta*, agree in having amorphous areolæ, bounded by flexuose tubes or lines; while *Alyssum*, *Berteroa*, and *Fibigia*, have narrow linear areolæ, bounded by parallel or slightly arched lines. *Capsella bursa* differs from *Thlaspi* and *Æthionema*, as *Draba* from *Alyssum*, and agrees with *Lepidium procumbens*, *Linn.*, improperly referred to *Hutchinsia*, and which equally has incumbent cotyledones. *Cochlearia* differs in like manner from *Kerneria*. And numerous other examples of the same agreement in nearly related plants, and of differences where the

usual sources of distinction are less available, might be noticed.

HESPERIS NITENS of Viviani is sparingly in the herbarium, both in flower and fruit. The seeds, though not ripe, are sufficiently advanced to show that the direction of the cotyledons is in this stage accumbent; and, as I have found in Cruciferæ generally that the ultimate agrees with the early state of cotyledons, I conclude they are likewise accumbent in the ripe seed. The plant is also abundantly different from Hesperis in other respects, and does not appear to be referable to any genus yet published. This new genus* I have dedicated to the memory of Dr. Oudney, who found the present species in many of the wadeys between Tripoli and Mourzuk, and remarks that camels and mules eat it.

[220] HESPERIS RAMOSISSIMA, which is also in the herbarium, was found in Fezzan. This plant differs in aspect from most of the other species of Hesperis, approaching in some points to Malcomia, in others to Matthiola; and as its cotyledons are very obliquely incumbent, it may form a section or subgenus, with a name, Hesperis (Plagiloba) ramosissima, indicating that character.

CAPPARIDEÆ, of which eight species occur in the collection, is the family next to be noticed. I consider this order as belonging to the same natural class with Cruciferæ; and that this class includes also Resedaceæ, Papaveraceæ, and Fumariaceæ.

M. De Candolle, in defining Capparideæ, appears to

¹ OUDNEYA.

CHAR. GEN. *Calyx clausus, basi bisaccatus. Filamenta distincta, edentula. Stigmata connata apicebus distinctis. Siliqua sessilis linearis rostrata, valvis planis uninerviis, funiculis adnatis, septo avenio areolarum parietibus subparallelis. Seminæ uniseriatia. Cotyledones accumbentes.*

Suffrutex (O. Africana nob. Hesperis nitens, *Viv. lib. p. 38, tab. 5, f. 3*), glaberrimus, ramosus. Folia integrerima sessilia aenia, inferiora obovata, superiore sublinearia. Racemi terminales, ebracteati. Flores mediocris magnitudinis, petalorum laminis obovatis venosis.

Obs. Oudneya ab Arabidi differt stigmatis forma, siliquæ rostro, et dissepimenti areolarum figura. Parrya ad quam genus nostrum accedit diversa est dissepimento binervi venoso! calyce haud clauso, siliquæ forma, et seminibus biseriatis testa corrugata.

regard the ovary as having in all cases only two placentæ, and therefore formed of two pistilla or carpella. But to this, which is certainly the more usual number, there are many exceptions. These exceptions occur chiefly in the genus *Capparis*, which, as it is at present constituted, includes species differing from each other in having an ovary with from two to eight placentæ, and consequently composed of an equal number of pistilla. *Capparis spinosa* is the most decided instance of the increased number of placentæ, and this, as well as some other nearly related species, are also remarkable in having septa subdividing the placentæ, and uniting in the centre of the compound ovary.

In the herbarium there are three species of the genus *Cleome*. Two of these, *C. pentaphylla* and *arabica*, are in many respects well-known plants; the third I believe to be an undescribed species, but nearly related to *mono-*
phylla.

If the very natural group, formed by the Linnean genus *Cleome*, is not to be preserved entire, its subdivision must be carried much further, and established on other grounds, than has been done by M. De Candolle, whose genera and sections appear to me to have been equally founded on partial considerations. Thus, his *Polanisia*, uniting all the *Cleomes* whose stamina exceed six, contains in its first section, in addition to the species from which the genus was formed, at least two sets of plants, having very little affinity either with each other or with the original species, whose only congener is placed in a second section.

Gymンドropsis also consists of two groups not very intimately connected; the first is composed of species belonging to South America, and having the usual aestivation of the family: the second, of which *C. pentaphylla* may be taken as the type, is chiefly African, and is readily distinguished by its very different aestivation,—the great peculiarity of which consists in the petals not covering the stamina at any period. To this mode of aestivation [221] of petals, which has never before been noticed, though it equally exists in *Crateva* and in *Resedaceæ*, I shall apply

the term *aperta*. It is constantly conjoined, and, perhaps, necessarily connected, with the early opening of the calyx, whose segments are originally connivent and slightly imbricate : for it may be here remarked, that in all the modifications of what I have termed imbricate aestivation of petals, they are, I believe, in the very early stage in like manner erect, and the sexual organs equally exposed.

If the expediency of preserving the genus Cleome entire were admitted, a question which I do not pretend at present to decide, it would still be of the greatest importance to arrange its numerous species according to their affinities, and carefully to distinguish the subordinate groups that compose it. To such inferior groups, whether termed subgenera or sections, names, in fact, have been of late years very generally assigned, both by zoologists and botanists.

It has not yet been proposed, however, that these subgeneric names should form an essential part of the name of the species ; although by employing them in this manner, while the principal groups would be kept in view, their subdivision would be carried to the same extent, and the subordinate groups as well expressed, as if they had been actually separated into distinct genera.

The adoption of this method, which would not materially disturb names already existing, would probably lead to a greater consistency in the formation of genera, with reference to the natural orders of which they are subdivisions. In this way also the co-operation of two classes of naturalists, at present opposed to each other on the question of the construction of genera, might to a certain extent be expected, and greater uniformity in nomenclature consequently secured.

These advantages appear to me so important, that some expedient for obtaining them will, I am persuaded, at no distant period, be generally adopted.

In favour of the present plan it may be remarked, that it is analogous to the method followed by the Romans in the construction of the names of persons, by which not only the original family, but the particular branch of that family to

which the individual belonged was expressed. Thus, the generic name corresponds with the nomen (Cornelius), the name of the section with the cognomen (Scipio), and that of the species with the prænomen (Publius).

Without attempting at present to obviate the objections to which the proposed innovation is no doubt liable, I shall proceed to apply it to *Cleome pentaphylla*. According to my view, the genus *Cleome* would include *Gynandropsis*, a name which, as that of a section, may be continued to those species of M. De Candolle's genus belonging to equinoctial America, and having the common aestivation of the family : while *Gymnogonia*, derived from its remarkable aestivation, may be employed for the section that includes *C. pentaphylla*, of which the name might be given in the following manner :

CLEOME (GYMNOGONIA) PENTAPHYLLA. This plant, the earliest known species of *Cleome*, and that on which the genus was chiefly constituted, was found in Bornou. The species is regarded by M. De Candolle as a native of the West India Islands, and he doubts whether it may not also belong to Egypt and India. On the other hand, I consider it a native of Africa and India, and am not satisfied with the evidence of its being also indigenous to the American Islands, where, though now very common, it has probably been introduced by the negroes, who use it both as a potherb and in medicine. It is not unlikely that M. De Candolle, in forming his opinion of the original country of this plant, has been in part determined by finding several species of his *Gynandropsis* decidedly and exclusively natives of the new continent. But if I am correct in separating these species from the section to which *Cleome (Gymnogonia) pentaphylla* belongs, this argument, which I have formerly applied to analogous cases,¹ would be clearly in favour of the opinion I have here advanced ; those species of the section with which I am acquainted being undoubtedly natives of Africa or of India.

CLEOME (SILIQUARIA) ARABICA (*Linn. sp. pl. ed. 2, p.*

¹ *Tuckey's Congo*, p. 469. (*Antè*, p. 156.)

939, *De Cand. prodr.* 1, p. 240), a supposed variety of which was found both in the neighbourhood of Tripoli and in Soudan, belongs to another subdivision of the genus, equally natural, and readily distinguishable. The species of this subdivision are included in M. De Candolle's second section of *Cleome*, but are there associated with many other plants, to which they have very little affinity.

All the species of *Cleome Siliquaria* are indigenous to North Africa and Middle Asia, except *violacea*, which is a native of Portugal. *Cleome deflexa* of M. De Candolle (*prodr.* 1, p. 240), founded on specimens in Mr. Lambert's herbarium, which were sent by Don Joseph Pavon as belonging to Peru, seems to present a remarkable exception to this geographical distribution of the section. But on examining these specimens I find them absolutely identical with some states of *violacea*. I think it probable, therefore, either that they are erroneously stated to have come from Peru, or that this species may have been there introduced from European seeds.

CADABA FARINOSA (*Forsk. Arab.* p. 68, *De Cand. prodr.* 1, p. 244) is in the herbarium from Bornou. The specimen is pentandrous, and in other respects agrees with all those which I have seen from Senegal, and with *Stroemia farinosa* (*Antè*, p. 94) of my catalogue of Abyssinian plants, collected by Mr. Salt, and published in his travels. M. De Candolle, who had an opportunity of examining this Abyssinian plant, refers it to his *C. dubia*, a species established on specimens found in Senegal, and said to differ from *farinosa*, slightly in the form of the leaves and in being tetrandrous. Of the plant from Abyssinia I have seen only two expanded flowers, one of which is decidedly pentandrous, the other apparently tetrandrous. Mr. Salt, however, from an examination of recent specimens, states it to be pentandrous. It is probably, therefore, not different from *C. farinosa* of Forskal, whose specimens M. De Candolle has not seen. And as the form of the leaves is variable in the specimens from Senegal, and not elliptical, but between oval and oblong, in those of Abyssinia, *C. dubia* is probably identical with, or a variety merely of, *farinosa*, as M. De Candolle himself seems to suspect.

CRATEVA ADANSONII (*De Cand. prod.* 1, p. 243) is in the collection from Bornou. This species is established by M. De Candolle upon a specimen in M. de Jussieu's herbarium, found in Senegal by Adanson, and is supposed to differ from all the other species in having its foliola equal at the base. I have examined the specimen in M. de Jussieu's herbarium, in which, however, the leaves not being fully developed, I was unable to satisfy myself respecting their form, but in a specimen, also from Senegal, which I received from M. Desfontaines, the lateral foliola, though having manifestly unequal sides, are but slightly unequal at the base, and the inequality consists in a somewhat greater decurrence of the lamina on the anterior or inner margin of the footstalk. As well as can be determined, in very young leaves, this is also the case in the specimen from Bornou; and it is manifestly so in my specimen of *C. lœta*, which appears to belong to the same species.

Crateva lœta was founded by M. De Candolle on a plant from Senegal, communicated by M. Gay, from whom I also received a specimen in 1824, with the remark that it was not different from *C. Adansonii*. In that specimen ¹⁸²⁴ the flowers are male with an imperfect pistillum; in the plant from Bornou they are hermaphrodite, with elongated filaments; and in the specimen received from M. Desfontaines they are also hermaphrodite, but the stamens, though apparently perfect, are fewer in number and shorter than the stipes of the ovary. I have observed, however, the flowers to be in like manner polygamous in some other species of *Crateva*, belonging both to India and America, a fact which materially lessens the dependence to be placed on characters taken from the number and length of the stamens in this genus.

Crateva Adansonii, it would appear, then, is the only known species of the African continent, for *C. fragrans* does not belong to the genus, and it will be difficult to distinguish this African *Crateva* from a plant which seems to be the most general species of India; except that in the latter, as in all the other species of the genus, the inequality of the lateral foliola, which is also more marked, consists in the

greater decurrence of the lamina being on the outer or posterior margin of the footstalk. This Indian species, which may be named *C. Roxburghii*, is the *Capparis trifoliata* of Dr. Roxburgh's manuscripts, but not *Nürvala* of *Hortus Malabaricus* (*vol. 3, p. 49, t. 42*), as he considers it. I have little doubt of its being also the plant described as *C. Tapia*, by Vahl (*symb. 3, p. 61*), his specific character well according with it, and not applying, as far as relates to the petals, to any known species of America. But as this character is adopted by Sir James Smith (*in Rees's Cyclop.*), it may likewise be *C. Tapia* of the Linnean herbarium; a conjecture the more probable as Linnæus has distinguished his *Tapia* by its ovate petals from *gynandra*, in which they are said to be lanceolate (*Sp. pl. ed. 2, p. 637*). This celebrated herbarium, however, is here of no authority, for Linnæus was never in possession of sufficient materials to enable him to understand either the structure and limits of the genus *Crateva*, or the distinctions of its species; and the specific name in question, under which he originally included all the species of the genus, ought surely to be applied to an American plant, at least, and if possible, to that of Piso, with whom it originated. It is hardly to be supposed that the plant intended by Piso can now with certainty be determined; the only species from Brazil, however, with which I am acquainted, well accords with his figure and short description. This Brazilian species is readily distinguishable both from *C. Adansonii* and *Roxburghii*, by the form of its petals, which, as in all the other [225] American species, are narrow-oblong or lanceolate; and from *C. gynandra* by the shortness of its stipes genitalium, or torus.

Crateva Tapia, so constituted, is, on the authority of a fragment communicated by Professor Schrader, the *Cleome arborea* of that author (*in Gætt. Anzeig. 1821, p. 707, De Cand. Prodr. 1, p. 242*); nor is there anything in the character of *C. acuminata* of De Candolle (*Prodr. 1, p. 243*), which does not well apply to our plant.

C. Tapia, as given by M. De Candolle (*op. cit.*), is characterised chiefly on the authority of Plumier's figure, in

the accuracy of which, either as to the number or length of stamens, it is difficult to believe, especially when we find it also representing the petals inserted by pairs on the two upper sinuses of the calyx.

The genus *Crateva* agrees, as I have already stated, in the remarkable aestivation of its flower with *Cleome Gymnogonia*, by which character, along with that of its fruit, it is readily distinguished from every other genus of the order. Although this character of its aestivation has never before been remarked, yet all the species referred to *Crateva* by M. De Candolle really belong to it, except *C. fragrans*, which, with some other plants from the same continent, forms a very distinct genus, which I shall name *RITCHIEA*, in memory of the African traveller, whose botanical merits have been already noticed.

CAPPARIS SODADA nob. *Sodada decidua*, *Forsk. Arab.* p. 81. *Delile, Flore d'Egypte*, p. 74, tab. 26. *De Cand. Prodr.* 1, p. 245.

The specimen in the herbarium is marked by Dr. Oudney as belonging to a tree common on the boundaries of Bornou. It is probably the *Suag*, mentioned in his journal, observed first at Aghedem, and said to be "a tetrandrous plant, having a small drupa, which is in great request in Bornou and Soudan, for removing sterility in females : it is sweetish and hot to the taste, approaching *Sisymbrium Nasturtium*;" and that "in passing the plant a heavy narcotic smell is always perceived."

I have here united *Sodada* with *Capparis*, not being able to find differences sufficient to authorise its separation even from the first section of that genus, as given by De Candolle.

Forskal describes his plant as octandrous, and M. De Candolle has adopted this number in his generic character. M. Delile (*op. cit.*), however, admits that the stamens vary from eight to fifteen ; and, in the specimen which I received ¹⁹²⁶ from M. Jomard, I have found from fourteen to sixteen. But were the number of stamens even constantly eight, this alone would not justify its separation from *Capparis*,

several octandrous species of which, belonging to the same section, are already known.

Another species of *Capparis*, also from Bornou, exists in the herbarium. It appears to be undescribed, and to belong to M. De Caudolle's first section of the genus; but the specimen is too imperfect to be satisfactorily determined.

Both these species have aculei stipulares, and it may here be remarked that all the plants belonging either to *Capparis*, or to any of the genera of the order whose fruit is a berry, in which these aculei are found, are indigenous either to Asia, Africa, or Europe; while all the aculeated Cleomes, with the exception of perhaps a single African species, are natives of equinoctial America.

MÆRUA RIGIDA. This plant, of which flowering specimens were collected at Aghedem, certainly belongs to Forskal's genus *Mærua*, adopted by Vahl and De Candolle; and I believe it to be a species distinct from the three already published. It is very nearly related, however, to a fourth species (*M. Senegalensis nob.*), of which I received a specimen from M. Desfontaines. M. De Candolle has placed the genus *Mærua* at the end of *Capparideæ*, between which and *Passifloreæ* he considers it intermediate. This view of its relation to these two orders I cannot adopt. To me it appears truly a *Capparidea*, having very little affinity with *Passifloreæ*, to which it seems to approach in one point only, namely, the corona of the calyx. But of a similar corona rudiments exist in several other African *Capparideæ*, and from some of these the genus *Mærua* is with difficulty distinguished.¹

¹ MÆRUA.

Mærua. *Forsk. Arab.* p. 104. *Vahl. Symb.* 1, p. 36. *De Cand. Prodr.* 1, p. 254.

CHAR. GEN. *Calyx* tubulosus: *limbo* 4-partito, aestivatione simplici serie valvata: *corona* faucis petaloidea. *Petala* nulla. *Stipes* genitalium elongatus. *Stamina* numerosa. *Pericarpium* (siliquiforme?) baccatum.

Frutices inermes, *pube*, *dum adsit*, *simplici*. *Folia* *simplicia* *coriacea*: *peliolo* *cum denticulo rami articulato*: *stipulis minutissimis setaceis*.

MÆRUA rigida, corymbis terminalibus paucifloris, foliis obovatis crassis rigidis aeniis nervo obsoleto, corona laero-multipartita.

DESC. *Frutex?* *Rami* stricti teretes tenuissime pubescentes. *Folia* sparsa,

RESEDACEÆ. The herbarium contains two species of ¹²²⁷ *Reseda*. The specimens of one of these are too imperfect to be determined. The other is probably undescribed, though very nearly related to *R. suffruticulosa*, and undata of Linnaeus. This supposed new species (*Reseda propinqua*) was found near Tripoli by Mr. Ritchie, and between Tripoli and Mourzuk by Dr. Oudney. It is remarkable in having the unguis of all the petals simple; that is, neither dilated, thickened, nor having any process or appendage at the point of union with the trifid lamina, into which they gradually pass. We have here, therefore, a species of *Reseda* with petals not different in any respect from those of many other families of plants; and, although this is an exception to their usual structure in the genus, I shall endeavour to show that all the deviations existing, however complex in appearance, are reducible to this more simple state of the organ.

RESEDACEÆ, consisting of *Reseda*, divisible into sections or subgenera, and *Ochradenus*, which may perhaps

obovata cum mucronulo brevissimo, plana, semiunguicularia, utrinque pubescentia brevissima simplici, nervo obsoleto, venis fere inconspicuis. *Petioli* lineam circiter longi. *Stipulae* laterales, setaceæ, petioli dimidio breviores, ramulo appressæ, post lapsum folii persistentes. *Ramuli floriferi* sèpius laterales abbreviati, e foliis confertis floribusque corymboso-fasciculatis (3—6), quorum exteriores folio subtensi; quandoque corymbus ramum terminat. *Pedunculi* teretes, tenuissime pubescentes, ebracteati excepto foliolo florali dum adsit ejusque stipulis vix conspicuis. *Calyx* infundibuliformis, extus tenuissime pubescens: *tubus* subcylindraceus, 8-striatus striis elevatis æqualibus, intus lineis duabus prominulis subcarnosis, eum limbi laciniis alternantibus, altera crassiore: *limbus* tubo paulo longior, 4-partitus laciniis æqualibus, ovatis acutiusculis, obsolete venosis, 5-nerviis, nervis extimis margini approximatis, e fureatione costarum quatuor tubi cum laciniis alternantium ortis; aestivatione simplici serie valvata marginibus tamen paulo inflexis. *Corona faucis* monophylla, laciniis limbi multoties brevior, laero-multipartita laciniulis subulatis inæqualibus. *Stipes genitalium* liber, cylindraceus, glaber, altitudine tubi. *Stamina*: *Filamenta* indeterminatim numerosa, viginti circiter, filiformia, glabra, aestivatione contortuplicata. *Antheræ* incumbentes, ovali-oblongæ obtuse, basi semibifidæ, loculis parallelo-approximatis, intus longitudinaliter dehisecentibus, aestivatione erectæ. *Ovarium* e centro filamentorum stipitatum, cylindraceum, glabrum, uniloculare placentis duabus parietalibus polyspermis. *Stylus* nullus. *Stigma* depresso-capitatum.

Obs. Species hæc proxime accedit Mæruæ senegalensi nob. quæ vix pubescens et foliis venosis distincta; in multis quoque convenit, sive descriptionis Forskalii, eum Mærua uniflora Vahl, a nobis non visa. Mærua angolensis, *De Cand.* (in Museo Parisiensi visa), cui flores pariter corymbosi et corona lacero-multipartita, satis diversa est foliis ovalibus.

be regarded as only one of these subdivisions, I consider very nearly related to Capparideæ, and as forming part of the same natural class. It differs in the variable number ^{228]} of the parts of its floral envelopes, from the other orders of the class, in which the quaternary or binary division is without exception; and it is especially remarkable in having the ovary open even in its earliest state. From Cruciferæ and Capparideæ, two families of the class to which they most nearly approach, Resedaceæ also differ in the apparent relation of the stigmata to the placentæ. The stigmata in this order terminate the lobes of the pistillum, and as these lobes are open sterile portions of the modified leaves, from the union of which in the undivided part I suppose the compound ovary to originate, they necessarily alternate with the placentæ. I have generally found, however, the upper part of each placenta covered by a fleshy or fungous process, which is connected with the margins of the lobes, and therefore with the stigmata, and is probably essential to the fecundation of the ovula. The singular apparent transposition of the placentæ in Sesamoides of Tournefort, so well described by M. Tristan in his ingenious ‘Memoir on the Affinities of Reseda,’¹ appears to me necessarily connected with the extreme shortness of the undivided base of the ovary; for in supposing this base to be elongated, the placentæ would become parietal, and the ovula, which are actually resupinate, would assume the direction usual in the order.

M. De Jussieu, in his *Genera Plantarum*, has included Reseda in Capparideæ, and to this determination I believe he still adheres. M. Tristan, in the memoir referred to, is inclined to separate it as a family intermediate between Passiflorefæ and Cistineæ, but more nearly approaching to the latter. M. De Candolle, who first distinguished Reseda as an order under the name here adopted, in 1819² placed it between Polygaleæ and Droséracæ, and consequently at no great distance from Capparideæ. He must, since, however, have materially altered his opinion respecting it; for

¹ *Annal. du Mus. d'Hist. Nat.* 18, p. 392.

² *Théor. Elem.* ed. 2, p. 244.

the order Resedaceæ is not included in the first or second part of his ‘*Prodromus*,’ and I can find no observation respecting it in these two volumes. It is probable, therefore, that he may intend to place it near Passifloreæ, as suggested by M. Tristan, or, which is more likely, that he has adopted the hypothesis lately advanced, and ingeniously supported, by Mr. Lindley, respecting its structure and affinities.¹

According to this hypothesis, in Reseda the calyx of authors is an involucrum, its petals neutral flowers, and [229] the disk or nectary becomes the calyx of a fertile floret in the centre; and, as a deduction from this view of its structure, the genus has been placed near Euphorbiaceæ.

The points in the structure of Reseda, which appear to have led Mr. Lindley to this hypothesis, are the presence and appearance of the hypogynous disk, the anomalous structure of the petals, and the singular aestivation of the flower; but it is no slight confirmation of the correctness of M. De Jussieu’s opinion, that all these anomalies occur in a greater or less degree in Capparideæ, and have been found united in no other family of plants. The remarkable aestivation of Reseda equally exists in Crateva, and in more than one subdivision of the genus Cleome; the hypogynous disk is developed in as great a degree in several Capparideæ; and an approximation to the same kind of irregularity in the petals occurs in two sections of Cleome.

The analogical argument alone then might, perhaps, be regarded as conclusive against the hypothesis. But the question, as far as relates to the petals, and consequently to the supposed composition of the flower, may be decided still more satisfactorily on other grounds. Both MM. Tristan and Lindley regard the upper divided membranaceous part of the petal as an appendage to the lower, which is generally fleshy. On the other hand, I consider the anomaly to consist in the thickening, dilatation, and inner process of the lower portion, and that all these deviations from ordinary structure are changes which take place after

¹ *Collect. Bot. tab. 22.*

the original formation of the petal. To establish these points, and consequently to prove that the parts in question are simple petals, and neither made up of two cohering envelopes, as M. Tristan supposes, nor of a calyx and abortive stamens, according to Mr. Lindley's hypothesis, I shall describe their gradual development, as I have observed it in the common Mignonette, a plant in which all the anomalies that have led to this hypothesis exist in a very great degree.

The flower-bud of *Reseda odorata*, when it first becomes visible, has the divisions of its calyx slightly imbricate and entirely enclosing the other parts. In this stage the unguis of each of the two upper petals is extremely short, not broader than the base of the lamina, and is perfectly simple; there being no rudiment of the inner process so remarkable in the fully expanded flower. The lamina at the same period may be termed palmato-pinnatifid, its divisions are all in the same plane, the terminating or middle segment is whitish or opaque, and several times longer than the lateral segments, which are semi-transparent.

[230] Of the remaining four petals, the two middle are dimidiato-pinnatifid, their lateral segments existing only on the upper side; and the two lower are undivided, being reduced to the middle segment or simple lamina. All the petals are erect, and do not cover the stamens in the slightest degree, either in this or in any other stage. The disk is hardly visible. The antheræ are longer than their filaments, of a pale-green colour; those on the upper or posterior side of the flower being manifestly larger, and slightly tinged with brown. The pistillum is very minute and open at the top. In the next stage the calyx is no longer imbricate, but open; the petals have their segments in nearly the same relative proportions; the interior margin of the unguis is just visible; but the transition from unguis to lamina is still imperceptible; the apex of the former not being broader than the base of the latter. It is unnecessary to follow the development through the more advanced stages of the flower, the facts already stated being, in my opinion, absolutely conclusive as to the real nature of the

parts in question : and I may remark that similar observations on certain genera of Caryophylleæ, especially Dianthus, Lychnis, and Silene, clearly establish the analogy between their petals and those of Reseda. .

I am aware that it has lately been proposed to include *Datisca* in Resedaceæ, to which it is nearly similar in the structure of its ovary, as M. de Jussieu has long since remarked. But this is the only point of resemblance between them ; for the calyx of *Datisca* is certainly adherent, and in most of its other characters it differs widely both from Reseda and from every other genus yet published. Among the numerous discoveries made by Dr. Horsfield in Java, there is a genus (*TETRAMELES nob.*), however, manifestly related to *Datisca*, and remarkable in the regular quarternary division of every part of its dioecious flowers. These two genera form an order very different from every other yet established, and which may be named DATISCEÆ.

CARYOPHYLLEÆ. Five species only of this family were collected near Tripoli, none of which are new.

Of ZYGOPHYLLEÆ, six species exist in Dr. Oudney's herbarium, namely, *Tribulus terrestris*, found in Bornou ; *Fagonia cretica*, from Tripoli to Benioled ; *Fagonia arabica*, at Aghedem ; *Fagonia Oudneyi nob.* with *Zygophyllum simplex* in Fezzan ; and *Zygophyllum album* everywhere in the desert.

This family, so distinct in habit from Diosmeæ or Rutaceæ, with which it was formerly united, is not easily characterised by any very obvious or constant peculiarities in its parts of fructification.

The distinguishing characters in its vegetation or habit are the leaves being constantly opposite, with lateral or ^[231] intermediate stipulæ, being generally compound, and always destitute of the pellucid glands, which universally exist in true Diosmeæ, though not in all Rutaceæ properly so called.

M. Adrien de Jussieu, in his late very excellent Memoir on the great order or class Rutaceæ, in distinguishing

Zygophylleæ¹ from the other subdivisions of that class in which he has included it, depends chiefly on the endocarp, or inner lamina of the pericarp, not separating from the outer lamina or united epicarp and sarcocarp, and on the texture of the albumen. His first section of Zygophylleæ, however, is characterised by the want of albumen; and in his second section I find exceptions to the remaining character, especially, in *Fagonia Mysorensis*, in which the two laminæ of the ripe capsule separate as completely as in *Diosmeæ*. Another plant, in my opinion, referable to the same order, and which, in memory of a very meritorious African traveller, I have named *Seetzenia africana*, has in its ripe capsule the epicarp, or united epicarp and sarcocarp, confined to the dorsal carina of each cell, the endocarp being the only membrane existing on the sides, which are exposed long before the bursting of the fruit. The plant in question has, indeed, many other peculiarities, some of which may, perhaps, be considered sufficient to authorise its separation from the order to which I have referred it; for the aestivation of its calyx is valvular, it has no petals, its five styles are distinct to the base, and the cells of its ovary appear to me to be monospermous. It completely retains, however, the characters of vegetation, on which I chiefly depend in distinguishing Zygophylleæ; and I have no doubt of its being *Zygophyllum lanatum* of Willdenow,² by whom it is stated to be a native of Sierra Leone; I suppose, however, on insufficient authority, for the specimens in the Banksian herbarium, from which I have made my observations, were found in South Africa near Olifant's River, by Francis Masson.

In all the species of *Fagonia*, and in the two species of *Zygophyllum* in Dr. Oudney's collection, a character in the fructification still remains which is not found in *Diosmeæ* or *Rutaceæ*, and which, were it general in Zygophylleæ, would satisfactorily distinguish this order from all the families it has usually been compared with. This character consists in the direction of the embryo with relation to the

¹ *Mém. du Mus. d'Hist. Nat.* 12, p. 450.

² *Sp. Plant.* 2, p. 564.

insertion of the funiculus, its radicle being seated at the opposite extremity of the seed, or to express, in the unim-pregnated ovarium, the infallible indication of this ^[232] position, the direction of the inner membrane and nucleus of the ovulum corresponds with that of its testa.

But this character, in general very uniform in natural families, and which, equally existing in Cistinæ, so well defines the limits of that order, as I have long since remarked,¹ would seem to be of less importance in Zygophylleæ.

M. Adrien de Jussieu, who, in his memoir already cited, admits its existence in Fagonia, and in both our species of Zygophyllum, considers it as an exception to the general structure of the latter genus, in the definition of which he retains the character of "radicula hilo proxima." I believe, however, that in all the species of Zygophyllum, except Fabago, which, possesses, also, other distinguishing characters, this opposition of the radicle to the external hilum will be found; for in addition to the two species contained in the herbarium, in both of which it is very manifest, I have observed it in *Z. coccineum*, and in all the species of South Africa that I have had an opportunity of examining. In some of these species, indeed, it is much less obvious, partly from the greater breadth of the funiculus, and also from its being closely applied, or even slightly adhering to the testa of the seed. But hence it is possible to reconcile the structure of these species with that of Fabago itself, in which the raphe seems to me to be external: and if this be really the case, Fabago differs from those Zygophylla of South Africa alluded to, merely in the more intimate union of the funiculus with the surface of the testa. Whether this observation might be extended to the other genera of the order, I have not yet attempted to ascertain.

BALANITES ÆGYPTIACA, though not belonging to Zygophylleæ, may be here mentioned. The specimen is from Bornou, but, like all the other plants of that country, has no particular place of growth indicated, nor is there any

¹ In *Hooker's Flora Scotica*, p. 284.

observation respecting it. For a very full and interesting history of this plant, I may refer to M. Delile's 'Flore d'Egypte' (p. 77, *tab.* 28).

Of CISTINEÆ, three species were observed between Tripoli and Mourzuk.

The GERANIACEÆ of the collection consist of four species of *Erodium*, all of which were found on the same journey.

Of MALVACEÆ, considered as a class, there are twelve species in the herbarium. Only two of these are particularly deserving of notice. The first, *Adansonia digitata*, found in Soudan, where the tree is called Kouka, is described by Captain Clapperton; the second, *Melhania* ^{233]} *Denhamii*, a new and remarkable species of the genus, differing from all the others in having its bractæ regularly verticillated and, at the same time, longer and much broader than the divisions of the calyx.

A single species of VITIS is in the collection, from Bornou.

NEURADA PROSTRATA, generally referred to Rosaceæ, was found in Wady Ghrurbi.

TAMARISCINEÆ. A species of Tamarix, apparently not different from *T. gallica*, is the *Attil*, common in Fezzan, where, according to Dr. Oudney, it is the only shady tree.

LORANTHEÆ. A species of Loranthus, parasitical on the *Acacia nilotica*, was observed very commonly from Fezzan to Bornou.

LEGUMINOSÆ. Of this class the herbarium contains thirty-three species, among which there are hardly more than two undescribed, and these belonging to a well-established genus.

Of the order or tribe MIMOSÆ only three species occur, namely, *Acacia nilotica*, *Mimosa Habbas*, and *Inga biglobosa*, or a species very nearly related to it. Of this last-named plant, I judge merely from ripe fruits adhering to the singular club-shaped receptacle, or axis of the spike. The specimens were collected in Soudan, and belonging to a tree of considerable importance to the inhabitants of that

country, by whom it is called *Doura*. According to Captain Clapperton, "The seeds are roasted as we roast coffee, then bruised, and allowed to ferment in water; when they begin to become putrid, they are well washed and pounded; the powder made into cakes, somewhat in the fashion of our chocolate; they form an excellent sauce for all kinds of food. The farinaceous matter surrounding the seed is made into a pleasant drink, and they also make it into a sweetmeat." The Doura of Captain Clapperton is probably not specifically different from the Nitta mentioned by Park in his 'First Journey'; nor from *Inga biglobosa* of the 'Flore d'Oware' of M. De Beauvois, according to whom it is the Nety of Senegal; and he also well remarks that *Inga biglobosa*, described by Jacquin as a native of Martinico, has probably been introduced into that island by the Negroes, as he himself found it to have been in St. Domingo.

Inga Senegalensis of M. De Candolle (*Prodr.* 2, p. 442) may also belong to the same species.

It is possible, however, that some of the plants here mentioned, though very nearly related to each other, and having all the same remarkable club-shaped spike, may be specifically distinct; for it appears from specimens collected at Sierra Leone by Professor Afzelius that two ¹²³⁴ plants having this form of spike are known in that colony, and two species, with similar inflorescence, probably distinct from those of Africa, are described in the manuscript 'Flora Indica' of Dr. Roxburgh. All these plants possess characters fully sufficient to distinguish them from *Inga*, to which they have hitherto been referred. The new genus which they form, one of the most striking and beautiful in equinoctial Africa, I have named **PARKIA**,¹ as a tribute of

¹ **PARKIA.**

ORD. NAT. *Leguminosæ-Mimosæ*: Cæsalpineis proximum genus.

CHAR. GEN. *Calyx* tubulosus ore bilabiato (§); aestivatione imbricata! *Petala* 5, subæqualia, supremo (paulo) latiore; aestivatione connivent-imbri-cata. *Stamina* decem, hypogyna, monadelpha. *Legumen* polyspermum: *epi-carpio* bivalvi; *endocarpio* in loculos monospermous sarcocarpio farinaceo tectos solubili.

Arbores (*Africanæ et Indie orientalis*) inermes. Folia bipinnata, pinnis folio-

respect to the memory of the celebrated traveller, by whom the fruit of this genus was observed in his first journey, and who, among other services rendered to botany, ascertained that the plant producing Gum Kino is a species of *Pterocarpus*.¹ I have formerly endeavoured to distinguish *Mimoseæ* from *Cæsalpineæ*, by the valvular aestivation of both its floral envelopes, and by the hypogynous insertion of its stamens. Instances of perigynous insertion of stamens have since been noticed by MM. Kunth and Auguste de St. Hilaire; but no exception has been yet pointed out to the ^{235]} valvular aestivation of their calyx and corolla. *Parkia*, however, differs from other *Mimoseæ*, not only in its aestivation, which is imbricate, but in the very manifest irregularity of its calyx, and in the inequality of its petals, which, though less obvious, is still observable.

Erythrophleum, another genus indigenous to equinoctial Africa, which I have elsewhere² had occasion to notice, and then referred to *Cæsalpineæ*, more probably belongs to *Mimoseæ*, although its stamens are perigynous. In this genus both calyx and corolla are perfectly regular, and their aestivation, if not strictly valvular, is at least not manifestly imbricate, though the flower-buds are neither acute nor angular. In *Erythrophleum* and *Parkia*, there-

lisque multijugis; stipulis minutis. Spicæ axillares, pedunculatæ, clavatæ, floribus inferioribus (dimidiis cylindracei racheos) sœpe masculis.

PARKIA Africana, pinnis sub-20-jugis, pinnulis sub-30-jugis obtusis intervalla æquantibus cicatricibus distinctis parallelis, glandula ad basin petioli, rachi communi eglandulosa, partialium jugis (2-3) summis glandula umbiliata.

Inga biglobosa, *Palis. de Beauv. Flore d'Oware*, 2, p. 53, tab. 90. *Sabine in Hortic. Soc. Transact.* 5, p. 444. *De Cand. Prodr.* 2, p. 442.

Inga Scenegalensis. *De Cand. Prodr.* 2, p. 442.

Mimosa taxifolia. *Pers. Syn.* 2, p. 266, n. 110.

Nitta. *Park's First Journey*, p. 336—337.

¹ *Park's Second Journey*, p. xxiv, where it is stated to be an undescribed species of that genus. Soon after that Narrative appeared, on comparing Mr. Park's specimen, which is in fruit only, with the figure published by Lamarck in his Illustrations (tab. 602, f. 4), and with M. Poiret's description (*Encyc. Meth. Botan.* 5, p. 728), I referred it to that author's *P. erinacea*, a name which is, I believe, adopted in the last edition of the *Pharmacopœia* of the London College. Dr. Hooker has since published a drawing of the same plant by the late Mr. Kummer, and, considering it a new species, has called it *Pterocarpus Senegalensis*. (*Gray's Travels in Western Africa*, p. 395, tab. D.)

² *Tuckey's Congo*, p. 430. (*Antè*, p. 111.)

fore, exceptions to all the assumed characters of Mimosæ are found, and there is some approach in both genera to the habit of Cæsalpineæ. It is still possible, however, to distinguish, and it will certainly be expedient to preserve, these two tribes or orders. Abandoning divisions strictly natural, and so extensive as the tribes in question, merely because we may not be able to define them with precision, while it would imply, what is far from being the case, that our analysis of their structure is complete, would, at the same time, be fatal to many natural families of plants at present admitted, and among others to the universally received class to which these tribes belong. No clear character, at least, is pointed out in the late elaborate work of M. De Candolle,¹ by which Leguminosæ may be distinguished from Terebintaceæ and Rosaceæ, the orders supposed to be most nearly related to it. It is possible, however, that such characters, though hitherto overlooked, may really exist; and I shall endeavour to show that Leguminosæ, independent of the important but minute differences in the original structure and development of its ovulum, may still be distinguished at least from Rosaceæ.

In the character of Polygaleæ, which I published in 1814,² I marked the relation of the parts of the floral envelopes to the axis of the spike, or to the subtending bractea. I introduced this circumstance chiefly to contrast Polygaleæ with Leguminosæ, and to prove, as I conceived, that Securidaca, which had generally been referred to the latter family, really belonged to the former.

M. De Jussieu, who soon after published a character of Polygaleæ, entirely omitted this consideration, and continued to refer Securidaca to Leguminosæ. M. De Candolle, however, in the first volume of his 'Prodromus,' has adopted both the character and limits of Polygaleæ, which I had proposed, though apparently not altogether satisfied with the description he himself has given of the divisions of the calyx and corolla.

The disposition of the parts of the floral envelopes, with

¹ Mémoires sur la Famille des Legumineuses.

² Flinders's Voy. to Terra Austr. 2, p. 542. (Antè, pp. 13, 14.)

reference to the axis of the spike, in Polygaleæ, namely, the fifth segment of the calyx being posterior or superior and the fifth petal anterior or inferior, is the usual relation in families the division of whose flower is quinary. This relation is in some cases inverted; one example of which I have formerly pointed out in Lobeliaceæ,¹ as I proposed to limit it, and a similar inversion exists in Leguminosæ. But this class also deviates from the more general arrangement of the parts of the flower with regard to each other. That arrangement consists, as I have long since remarked,² in the regular alternation of the divisions of the proximate organs of the complete flower. To this arrangement, indeed, many exceptions are well known; and M. De Candolle has given a table of all the possible deviations, but without stating how many of these have actually been observed.³

In Leguminosæ the deviation from the assumed regular arrangement consists in the single pistillum being placed opposite to the lower or anterior segment of the calyx.

In these two characters, namely, the relation of the calyx and corolla both to the simple pistillum and to the axis of the spike or to the bractea, Leguminosæ differ from Rosaceæ in which the more usual arrangements are found.

But in those Rosaceæ in which the pistillum is solitary and placed within the anterior petal, its relation to the axis of the spike is the same as that of Leguminosæ, in which it is within the anterior division of the calyx. And in all families, whether dicotyledonous or monocotyledonous, this, I believe, is uniformly the position of the simple solitary pistillum with regard to the spike or bractea.

The frequent reduction of Pistilla, in plants having the other parts of the flower complete in number, must have been generally remarked. But the order in which these abstractions of pistilla take place, or the relations of the reduced series to the other parts of the flower, have, as far as I know, never yet been particularly attended to. It will probably appear singular that the observation of these

¹ *Flinders's Austr.* 2, p. 560. (*Antè*, p. 32.)

² *Prodr. Flor. Nov. Holl.* 1, p. 558. ³ *Theor. elem. ed.* 2, p. 183.

relations in the reduced series of pistilla should have suggested the opinion, that in a complete flower, whose ²²⁷ parts are definite, the number of stamina and also of pistilla is equal to that of the divisions of the calyx and corolla united in Dicotyledones, and of both series of the perianthium in Monocotyledones.

This assumed complete number of stamina is actually the prevailing number in Monocotyledones; and though in Dicotyledones less frequent than what may be termed the symmetrical number, or that in which all the series are equal, is still found in decandrous and octandrous genera, and in the greater part of Leguminosæ. The tendency to the production of the complete number, where the symmetrical really exists, is manifested in genera belonging or related to those pentandrous families in which the stamina are opposite to the divisions of the corolla, as by *Samolus* related to Primulaceæ, and by *Baeobotrys*, having an analogous relation to Myrsinæ; for in both these genera, five additional imperfect stamina are found alternating with the fertile, and consequently occupying the place of the only stamina existing in most pentandrous families. Indications of this number may also be said to exist in the divisions of the hypogynous disk of many pentandrous orders.

With respect to the Pistilla, the complete number is equally rare in both the primary divisions of phænogamous plants. In Monocotyledones the symmetrical number is very general, while it is much less frequent in Dicotyledones, in which there is commonly a still further reduction.

Where the number of Pistilla in Dicotyledones is reduced to two, in a flower in which both calyx and corolla are present and their division quinary, one of these pistilla is placed within a division of the calyx, the other opposite to a petal or segment of the corolla. In other words, the addition to the solitary pistillum, (which is constantly anterior or exterior), is posterior or interior. This is the general position of the component parts of a bilocular ovary, or an ovary having two parietal placentæ; and in flowers whose division is quinary, I can recollect no other exceptions to it than in some genera of Dilleniaceæ.

It is particularly deserving of notice, that the common position of the cells of the bilocular pericarpium with relation to the axis of the spike was well known to Cæsalpinus, who expressly distinguished *Cruciferæ* from all other bilocular families by their peculiarity in this respect, the loculi in that family being placed right and left, instead of being anterior and posterior.¹

[²³⁸] On the subject of the position of the Pistilla in the other degrees of reduction from the symmetrical number, I shall not at present enter. But in reference to Leguminosæ I may remark that it would be of importance to ascertain the position of the Pistilla in the pentagynous Mimosea, stated to have been found in Brazil by M. Auguste De St. Hilaire.² Are these Pistilla placed opposite to the divisions of the calyx, as might probably be inferred from the position of the solitary Legumen in this class? Or are we to expect to find them opposite to the petals, which is the more usual relation, and their actual place in Cnestis, though the single ovary of Connarus, a genus belonging to the same family, is seated within the anterior division of the calyx?

In the very few Leguminosæ in which the division of the flower is quaternary, namely, in certain species of Mimosa, the ovary is still placed within one of the divisions of the calyx.

As to *Moringa*, which was originally referred to this class from a mistaken notion of its absolutely belonging to Guilandina, it is surely sufficiently different from all Leguminosæ, not only in its compound unilocular ovary with three parietal placentæ, but also in its simple unilocular antheræ; and it appears to me to be an insulated genus, or family (*Moringeæ*), whose place in the natural series has not yet been determined.

CÆSALPINEÆ. Of this tribe, four species only occur in the collection. One of these is *Bauhinia rufescens* of Lamarck (*Illustr. 329, f. 2*); another is *Cassia* (*Senna*)

¹ *Cæsalp. de Plantis*, p. 327, cap. xv, et p. 351, cap. liii.

² *De Cand. Legum.* p. 52.

obovata, which, according to Dr. Oudney, grows wild in small quantities in Wady Ghrurbi.

PAPILIONACEÆ. Twenty-six species of this tribe are contained in the herbarium, none of which form new genera, and the only two species that appear to be unpublished belong to Indigofera.

Alhagi Maurorum, or *Agoul*, is abundant in Fezzan, where it forms excellent food for camels.

COMPOSITE. Of this class, thirty-six species exist in the collection. The far greater part of these were found in the vicinity of Tripoli and in the Desert. All of them appear to belong to established genera, and very few species are undescribed.

RUBIACEÆ. The herbarium contains only six species of this family, five of which, belonging to Spermacoce and ¹²³⁹ Hedyotis, were found in Bornou and Soudan ; the sixth, a species of Galium, near Tripoli.

Of ASCLEPIADEÆ only three plants occur. One of these is a new species of *Oxystelma*, exactly resembling in its flowers *O. esculentum* of India, from which it differs in the form of its leaves, and in that of its fruit.¹ A species of Dœnia was found in the Desert ; but the specimens are too imperfect to be ascertained.

Of APOCINEÆ, strictly so-called, there is no plant whatever in the collection ; and of Gentianæ, a single species only of Erythraæ.

SESAMEÆ. An imperfect specimen of *Sesamum pterospermum*, of the catalogue of Mr. Salt's Abyssinian plants,² is in the collection from Bornou.

SAPOTÆ. The only plant of this family in the herbarium is the *Micadania*, or Butter Tree of Soudan, particularly noticed by Captain Clapperton. The specimen, however, is very imperfect, consisting of detached leaves, an incomplete fruit, and a single ripe seed. On comparing these leaves with the specimen of Park's Shea Tree,³ in the

¹ *OXYSTELMA Bornouense*, floribus racemosis, corollæ laciniis semiovatis, folliculis inflatis, foliis lanceolatis basi cordatis.

Obs. Inflorescentia et corolla omnino *O. esculenti*, a quo differt folliculis inflatis, et foliis omnibus basi cordatis.

² *Salt's Voy. to Abyss.* append. p. lxiii. (*Antè*, p. 94.)

³ *Park's First Journey*, pp. 202 and 352.

Banksian herbarium, I have little doubt that they both belong to one and the same species. Whether this plant is really a Bassia, is not equally certain; and the seed at least agrees better with *Vitellaria paradoxa* of the younger Gærtner (*Carpol. tab. 205*) than with that of Bassia figured by his father (*de Fruct. et Sem. Pl. tab. 104*).

That the woody shell in the nuts of all Sapoteæ is really formed of the testa or outer membrane of the seed, as I have elsewhere stated¹ and not of a portion of the substance of the pericarpium, according to the late M. Richard and the younger Gærtner, is proved, not only by the aperture or micropyle being still visible on its surface, as M. Turpin has already shown in one case (*Ann. du Mus. d'Hist. Nat. 7, tab. 11, f. 3*); but also by the course and termination of the raphe, as exhibited in the younger Gærtner's figures of *Calvaria* and *Sideroxylum* (*Carpol. tabb. 200, 201, et 202*), and by the origin and ramification of the internal vessels.

^{240]} SCROPHULARINÆ. Only six species of this family occur, none of which are unpublished.

OROBANCHE COMPACTA of Viviani was observed between Fezzan and Bornou.

Of CONVOLVULACEÆ there are five species, four of which belong to Bornou; the fifth is an aquatic *Ipomœa*, found creeping on the borders of a small lake near Tintuma. Possibly this plant may be *Ipomœa aquatica* of Forskal, and consequently *Convolvulus repens* of Vahl (*symb. 1, p. 17*). It is not, however, the plant so called by Linnæus, which proves, as I have elsewhere stated (*Prod. Fl. Nov. Holl. 1, p. 483*) to be *Calystegia sepium*; nor does it belong to either of his synonymes. Our plant differs also from Vahl's description of his *Convolvulus repens*, in having constantly single-flowered peduncles, and leaves whose posterior lobes are rather acute than obtuse, and are quite entire. It is probably, therefore, distinct; and I have named it *Ipomœa Clappertoni*.²

¹ *Prod. Flor. Nov. Holl. 1, p. 528.*

² *IPOMŒA Clappertoni*, glaberrima repens, foliis sagittatis: lobis posticis acutiusculis integerrimis, pedunculis unifloris.

Among the few *Labiatae*, there is a species of *Lavandula*, possibly distinct from but very nearly related to *L. multifida*. It was found on the mountains of Tarhona.

Of *BORAGINÆ*, the herbarium includes eleven species, the greater part of which were collected near Tripoli, and all of them belong to well-established genera.

PRIMULACEÆ. Of this family two species of *Anagallis* occur in the collection, and of these *A. cærulea* was observed both near Tripoli and in Bornou.

SAMOLUS VALERANDI was also found near Tripoli, in Wady Sardalis in Fezzan, and in Bornou.

Of Dicotyledonous, or even of all phænogamous plants, *S. Valerandi* is perhaps the most widely diffused. It is a very general plant in Europe, has been found in several parts of North Africa, in Dr. Oudney's herbarium it is from Bornou, I have myself observed it at the Cape of Good Hope and in New South Wales, and it is also indigenous to North America.

The geographical distribution of the genus *Samolus* is equally remarkable. At present eight species are known, of which *S. Valerandi* is the only one indigenous to Europe or which, indeed, has been found in the northern hemisphere, except the nearly related *S. ebracteatus* of Cuba. All the other species belong to the southern hemisphere, where *S. Valerandi* has also a very extensive range.

Of *PLUMBAGINÆ*, there are three species of *Statice Taxanthema*; for the latter name may be preserved as belonging to a section, though hardly as that of a genus, so far at least as depends on inflorescence, which in both subdivisions of *Statice* is essentially similar, that of *Statice Armeria* being only more condensed. Of the three species in the herbarium, one appears to be unpublished.

Among the plants of the *Apetalous orders* in the collection, there are very few remarkable, and hardly any new species.

Gymnocarpus decandrum was observed by Dr. Oudney very commonly in gravelly deserts, on the route from Tripoli to Fezzan; and *Cornulaca monacantha* of M. Delile is said

to be widely extended from Tripoli to Bornou, and to be excellent food for camels.

MONOCOTYLEDONES. The number of species belonging to this primary division contained in the herbarium is altogether seventy. But Gramineæ and Cyperaceæ being excluded, thirteen only remain, namely, three species of *Juncus*, a single *Commelina*, three Melanthaceæ, three Asphodelæ, one species of *Iris*, and two Aroideæ, of which *Pistia Stratiotes* is one.

Of these thirteen plants, two appear to be unpublished, both of them belonging to Melanthaceæ. The first, a congener of *Melanthium punctatum*, which is also in the collection, was found in Fezzan.

The second is a species of *Colchicum*, very different from any hitherto described; and which yet, by Mr. Ritchie, who first observed it, is said to be common in the desert near Tripoli, where it was also found by Dr. Oudney.

This species, which I have named *Colchicum Ritchii*, is easily distinguished from all its congeners by having two cristæ or membranous processes, which are generally fimbriated, at the base of each segment of the perianthium, parallel to each other and to the intermediate filament. But this character, though excellent as a specific difference, is neither of generic importance, nor sufficient to authorise the formation of a separate section.¹

^{242]} Bulbocodium and Merendera, however, which, following Mr. Ker,² I consider as belonging to *Colchicum*, appear to me decidedly to form subgenera or sections, and in this opinion I am confirmed by having found a fourth section of the same genus. This fourth subgenus is established on *HYPOXIS FASCICULARIS*, a plant which has been seen by very few botanists, and which Linnæus introduced

¹ *Colchicum (Hermodactylus) Ritchii*, limbi laciñiis basi intus bicristatis! fasciculo 2—multifloro, foliis linearibus.

Obs. Spathæ 2-8-floræ; limbi laciñiæ vel lanceolatæ acutiusculæ vel oblongæ obtusæ; cristæ laciñiarum omnium sœpe fimbriato-inceisæ, exteriorum nunc integerrimæ. Ovula in singulis ovarii loculis biseriata, placentarum marginibus approximata; nec ut in *C. autumnali* quadriseriata,

² *Botan. Magaz.* 1028.

into his 'Species Plantarum,' and referred to Hypoxis, solely on the authority of the figure published in Dr. Russell's 'History of Aleppo.' In the Banksian Herbarium I have examined part of the original specimen of this species, found by Dr. Alexander Russell, and figured by Ehret in the work referred to, as well as more perfect specimens collected by Dr. Patrick Russell; and am satisfied that its ovary is not in any degree adherent to the tube of the perianthium. I find also that *Hypoxis fascicularis* differs from *Colchicum* merely in having a simple unilocular ovary, with a single parietal placenta and an undivided style, instead of the compound trilocular ovary, with distinct or partially united styles, common to all the other sections of that genus.

A reduction, as in this case, to the solitary simple pistillum,¹ though existing in all Gramineæ and in certain genera of several other families of Monocotyledones, is yet comparatively rare in that primary division of phænogamous plants, and in the great class Liliaceæ, the present species of *Colchicum* offers, I believe, the only known example.¹²¹³ Yet this remarkable character is here so little influential, if I may so speak, that *Hypoxis fascicularis* very closely resembles some states of *Colchicum Ritchii*, and in the Banksian herbarium has actually been confounded with another species of the first or trigynous section of the genus.

To the first section, which includes *Colchicum Ritchii*,

¹ The late celebrated M. Richard, in his excellent 'Analyse du Fruit,' in pointing out the distinctions between a simple and compound pericarpium, produces that of Melanthaceæ as an example of the compound, in opposition to that of Commelinaceæ or of Juncaceæ, which, though equally multilocular, he considers as simple. A knowledge of the structure of *Colchicum Monocaryum* would, no doubt, have confirmed him in his opinion respecting Melanthaceæ.

It has always appeared to me surprising that a carpologist so profound as M. Richard, and whose notions of the composition of true dissepiments, and even of the analogy in placentation between multilocular and unilocular pericarpia, were, in a great degree, equally correct and original, should never have arrived at the knowledge of the common type of the organ or simple pistillum, to which all fruits, whether unilocular or multilocular, were reducible; and that he should, in the instance now cited, have attempted to distinguish into simple and compound two modifications of the latter so manifestly analogous, and which differ from each other only in the degree of coalescence of their component parts.

the subgeneric name *Hermodactylum* may, perhaps, be applied, while that established on *Hypoxis fascicularis* may be called *Monocaryum*.

The position of the pistillum in *Colchicum (Monocaryum) fasciculare* is not easily determined. I believe it to be placed within the anterior segment of the outer series of the perianthium; but, from the great length of the tube, it is difficult to ascertain such a point in dried specimens. This, however, is the position in which I should expect it, both in reference to the usual relation of the solitary simple pistillum to the axis of the spike, or to the subtending bractea in all phænogamous plants, and also with regard to the constant relation of the parts of the compound pistillum to the divisions of the perianthium in Monocotyledones; for it is worthy of remark, that a difference in this relation may be said to exist in the two primary divisions of phænogamous plants—the pistilla when distinct, or their component parts when united, being in Dicotyledones usually placed opposite to the petals, when these are of equal number; while in Monocotyledones the cells of the trilocular ovary are, I believe, uniformly opposite to the divisions of the outer series of the perianthium.

CYPERACEÆ. Of twelve species of this family existing in the herbarium, six are referable to *Cyperus*, three to *Fimbristylis*, and three to *Scirpus*. Among these there is no remarkable, nor, I believe, any undescribed species. Of *C. Papyrus*, which, according to Captain Clapperton, grows in the Shary, there is no specimen in the collection.

GRAMINEÆ. Of this extensive family, with which Dr. Oudney was more conversant than with any other, and to which, therefore, during the expedition, he probably paid greater attention, the herbarium contains forty-five species; and in dividing the order into two great tribes, as I have for-²⁴⁴ merly proposed,¹ thirty of these species belong to *Poaceæ* and fifteen to *Paniceæ*. This relative proportion of these two tribes is considerably different from what might have

¹ *Flinders's Voy. to Terra Austr. 2, p. 582. (Ante, pp. 57-8.)*

been expected, in the climates in which the collection was formed ; it seems, however, to be connected with the nature of the surface ; for in the Great Desert the reduction of Paniceæ is still more remarkable ; this tribe being to Poaceæ, in that region, in the proportion of only five to eighteen.

Dr. Oudney remarks, with respect to the grasses of the desert, that he observed no species with creeping roots ; for a species of *Arundo* related to *Phragmites*, which he notices as the only exception, is not properly a desert plant.

Among the very few Gramineæ deserving particular notice, the first is *AVENA FORSKALII* of Vahl. The specimens in the herbarium which were collected in the Desert of Tintuma in some respects differ from all the others that I have seen of this variable species. In the Banksian herbarium there is an authentic specimen from Forskal ; I have received from M. Delile specimens both of his *A. Forskalii* and *arundinacea*, described and figured in his 'Flore d'Egypte' ; and am also in possession of others in somewhat different states, collected in Egypt by M. Nectoux and Dr. Sieber. From a comparison of all these specimens I am led to believe that *A. Forskalii* and *arundinacea* are not specifically distinct ; and it is at least evident that *arundinacea* more nearly approaches to the plant of Forskal than that to which M. Delile has applied the name *Forskalii*.

This grass, which does not belong to *Avena*, is referable to *Danthonia*, from the structure of the outer valve of its perianthium. But *Danthonia* requires subdivision into several sections, of which, perhaps, our plant may be considered as forming one.

The character of the section established on *Danthonia Forskalii* would chiefly consist in the very remarkable obliquity of the joints of the locusta, which is, indeed, so great, that after their separation each flower seems to have at the base an almost vertically descendent spur ; and as the inferior extremity of the upper joint is produced beyond the lower, a short calcar actually exists before separation, and

this calcar is equally manifest in the terminal rudiment of the locusta. The present, therefore, is a case of more remarkably oblique articulation in grasses than even that existing in *Holcus acicularis* (Andropogon acicularis, Retz), which led to the formation of *Centrophorum*, a genus still admitted by Professor Sprengel,¹ and respecting the structure of which a very singular explanation has been lately offered by M. Raspail.² In one respect, the two cases differ. In *Danthonia (Centropodia) Forskalii*, the articulations being in the axis of the locusta or spicula, each flower appears to have this spur-like process; while in *Holcus (Rhaphis) acicularis*, the joint being in the peduncle or branch of the racemus, the spur is common to three locustæ.

Dr. Fischer, in whose herbarium the specimen was observed which led to the formation of *Centrophorum*, will probably recollect the communication made to him on the subject of that plant, of which Dr. Trinius himself has since corrected the characters. He retains it, however, as a distinct genus, for which he has adopted the name *Rhaphis*, given to it by Loureiro, by whom it was originally proposed on other, but not more satisfactory grounds.

TRIRAPHIS PUMILIO is the second plant of this family to be noticed. It is undescribed, and belongs to a genus of which the only two published species were found in the intratropical part of New Holland.³ In several points of structure the African plant is very different from *T. pungens*, the first of these species; in some respects it approaches to *mollis*, the second species, especially in the inequality of its setæ or aristæ; but it differs from both in habit, and in having only one perfect flower in each locusta.⁴

Of *PENNISETUM DICHOTOMUM* (*Delile, Flore d'Egypte*, p. 15, tab. 8, f. 1), which, in several different states, is in the collection, it is remarked by Dr. Oudney that "it

¹ *Syst. Veg.* 1, p. 132.

² *Annal. des Scien. Nat.* 4, p. 425.

³ *Prodri. Flor. Nov. Holl.* 1, p. 185.

⁴ *Triraphis Pumilio*, panicula coarctata abbreviata, locusta glumam vix superante 3-4-flora: flosculo insimo hermaphrodito; reliquis neutris univalvibus.