THE
TRANSACTIONS
OF THE
LINNEAN SOCIETY
OF LONDON.
VOLUME XII.

LONDON:
PRINTED BY
RICHARD AND ARTHUR TAYLOR, SHOE-LANE:
SOLD AT THE SOCIETY'S HOUSE, NO. 9, GERRARD-STREET, SOHO;
AND BY LONGMAN, HURST, REES, ORME, AND BROWN,
PATERNOSTER-ROW.

MDCCXVIII.

MISSOURI
BOTANICAL
GARDEN.
THE
TRANSACTIONS
OF THE
LINNEAN SOCIETY
OF
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VOLUME XII.
PART THE FIRST.

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MDCCXVII.
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A point of botanical history has just been cleared up by my examinations of the manuscripts and dried specimens of the late Dr. J. Sibthorp, which, not being admissible into the Flora Graeca, I think proper to rescue from oblivion, by requesting you to lay it before the Linnean Society.

Pococke, in his well-known "Description of the East," vol. ii. part 1. p. 230, speaking of Cyprus, has the following passage: "Most of the trees in the island are evergreen; but it is most famous for the tree called by the natives Xylon Effendi, the Wood of our Lord, and by naturalists Lignum Cyprinum and Lignum Rhodium, because it grows in these two islands. It is called also the Rose Wood, by reason of its smell. Some say it is in other parts of the Levant, and also in the isle of Martinico. It grows like the Platanus or Plane-tree, and bears a seed or mast like that, only the leaf and fruit are rather smaller. The botanists call
call it the Oriental Plane-tree. The leaves being rubbed have a fine balsamic smell, with an orange flavour. It produces an excellent white turpentine; especially when any incisions are made in the bark. I suppose it is from this that they extract a very fine perfumed oil, which, they say, as well as the wood, has the virtue of fortifying the heart and brain. The common people here cut off the bark and wood together, toast it in the fire, and suck it, which they esteem a specific remedy in a fever, and seem to think that it has a miraculous operation."

So far Dr. Pococke, who in the 2d part of the same vol. p. 188, mentions this tree again, and, in plate 89, gives a tolerable, but not precisely botanical figure of it. This plate is cited by Willdenow, *Sp. Pl. vol. 4. 475*, as a representation of the *Liquidambar imberbe*, Ait. *Hort. Kew*, ed. 1. vol. 3. 365. That author perceiving it to be no *Platanus*, but rather a *Liquidambar*, reasonably enough concluded it to represent the Oriental, rather than the American, species of that genus. The figure, though drawn and engraved by Ehret, is not sufficiently accurate to determine so nice a point. As it does not show the hairiness about the veins of the leaves, which distinguishes the occidental *Liquidambar* from the oriental, Willdenow is the more excusable; though the outline of the foliage agrees best with the former.

Dr. Sibthorp, in his visit to Cyprus, was anxious to ascertain the tree mentioned by Pococke, and the result of his inquiry cannot be better related than in the words of his manuscript journal.

"April 19, 1785, at eight in the morning we left Upreva, and, passing through the vales below, gradually ascended the mountains of Antiphoniti. At noon we arrived at the convent, most romantically situated among the mountains, with a view of the sea, and a distant sight of the mountains of Caramania. I was come
come here, on the authority of Pococke, to see the Lignum Rhodium. This the Greeks call Xylon Effendi. The Eugumeno of the convent, a very old man, offered himself as my conductor; and leading me a few paces below the convent, into a garden, now covered with rubbish, he pointed out a tree, which upon examination I found to be Liquidambar Styraciflua. The trunk of it was much hacked. Different bits of it had been carried off by the curious or superstitious, as an ornament to their cabinets or churches. This was probably the same tree that Pococke had seen. To ascertain the Lignum Rhodium has been much wished by the naturalists. An American tree, growing in the swamps of Virginia, seems to have little claim to be considered as the tree which should produce it. The name of Xylon Effendi, and the traditions of the convent, testify the reputation in which this tree has long been held in the island. It was probably originally introduced by the Venetians during their possession of Cyprus. I could not discover, either from observation or inquiry, that it was to be found in any other part of the island; nor do I recollect that the Liquidambar Styraciflua has been mentioned, by any botanist, as an oriental tree. Whether the Lignum Rhodium of the shops is the wood of this tree or not, I am doubtful. The first Aspalathus of Dioscorides, I think, is certainly the Lignum Rhodium of the ancients.”

Dr. Sibthorp then proceeds to mention two species of Spartium, one of which he suspects to be the first, and the other the second, Aspalathus of Dioscorides; but the want of descriptions, and of marked specimens, renders it impossible to distinguish what he meant. I do not presume to reconcile the discordant accounts, which may be found in writers on the Materia Medica, respecting the Lignum Rhodium; nor are these writers even agreed whether its name originated from the rose-like scent of the wood, or from
the isle of Rhodes being its native country. We find nothing among them indicative of the above Liquidambar, or any similar tree. It is evident that Pococke had but a superficial knowledge of the historical, and still less of the botanical, part of the subject. The only point I have had in view, after the example of Dr. Sibthorp, was to ascertain Pococke’s plant. Specimens preserved in the herbarium of my deceased friend, and a pencil sketch by Mr. Bauer, show this to be, without any doubt, what he determined it, the Liquidambar Styraciflua of Linnaeus, and not, as Willdenow presumed, the imberbe of Aiton. This last was brought from the Levant, Duhamel says from Caria, by Peysonel to the Paris garden, from whence I have an authentic specimen. Miller obtained seeds, by which the L. imberbe was introduced into our gardens, and he describes it well. Nothing can be more distinct as a species; but it was not well ascertained when Dr. Sibthorp began his travels, which will account for his adverting to the American Liquidambar only.

There still remains great difficulty in accounting for the introduction of this tree into Cyprus, and for its becoming so famous there. The plant is not known to have been cultivated in England, much before the end of the seventeenth century, scarcely fifty years before Pococke found it, apparently long established in Cyprus. The Venetians were owners of this island from the year 1480 to 1570; so that if they, as Dr. Sibthorp guesses, introduced this tree, it must have been among the earlier botanical importations from the new-discovered continent. But we can find no traces of the Liquidambar tree having, any where, excited the particular attention of the Venetians, or any other Italians, either for medical, economical, or religious purposes; nor does it occur in their gardens, or even their botanical catalogues, as far as I can trace. Pococke’s vague mention of the “isle of Martiniico”
nico” might induce a suspicion of its having been obtained from thence; but no Europæans were settled in that island previous to the year 1635, nor do we know that the tree, being a native of North America, would grow in so hot a climate.

How the Liquidambar Styraciflua travelled to Cyprus, must therefore remain unexplained; for we have not even a legend to help us, like that of the staff of Joseph of Arimathea at Glastonbury. That so great a novelty should have acquired considerable reputation in the garden of a Cyprian convent, so as to have even supernatural properties attributed to it, may not so much excite our wonder. Its celebrity indeed appears to have declined between the periods of Dr. Pococke's visit and Dr. Sibthorp’s, but the tree itself still flourished. Dr. Sibthorp, like his predecessor, found it forming seed; yet it does not appear to have scattered its progeny over the neighbourhood, as, in so fine a climate, it might have been expected to have done, though I have never heard of its bringing any seed to perfection in England, where it rarely even blossoms.

I remain, &c.

Norwich, Feb. 20, 1815.

J. E. SMITH.
II. Of the Formation of the Vegetable Epidermis. By the Rev. Patrick Keith, F.L.S.

Read March 7, 1815.

The pellicle that constitutes the vegetable epidermis has generally been regarded as a membrane essentially distinct from the parts which it invests, and as generated with a view to the discharge of some peculiar functions in the vegetable economy. Some phytologists, however, have viewed it in a light altogether different, and have regarded it as being merely the effect of accident, and nothing more than a scurf formed upon the exterior and pulpy surface of the parenchyma indurated by the action of the air. This was the opinion of Grew and Malpighi, and, though it does not seem to have ever met with any very general reception, has been revived of late by M. Mirbel, who, professing to be dissatisfied with the analogy that has generally been thought to exist between the epidermis of the animal and vegetable, contends that the latter is nothing more than the indurated surface of the parenchyma, from which it differs only in such circumstances as are occasioned by position. If it is more or less transparent; if it is tougher and firmer in its texture than the parenchyma, or any of its parts; it is only because it is constantly exposed to the influence of light and air, and to the contact of such bodies as float in the atmosphere; but it is not to be regarded as constituting a distinct organ or membrane; or as exhibiting
exhibiting any proof of its being analogous to the epidermis of animals*.

Such is the substance of M. Mirbel's opinion, against which he is aware that objections may still be urged. For it may be said, If this is the true origin of the epidermis, how comes it to separate so easily from the interior parts in the spring? To this objection M. Mirbel furnishes the following reply, namely, that its facility of detachment is owing to the disorganization occasioned in it by means of its exposed situation, which has even the effect of ultimately separating it from the plant altogether, as may be seen in the instances in which it bursts and exfoliates when it is not able to expand in proportion to the internal parts. And thus M. Mirbel presumes he has got rid of all difficulties.

But the above is by no means the most formidable objection to which the hypothesis is liable. For if it be true that the epidermis is nothing more than the pellicle formed on the external surface of the parenchyma indurated by the action of the air, then it will follow that an epidermis can never be completely formed till such time as it has been exposed to that action. But it is known that the epidermis exists in a state of complete perfection, in cases where it could not possibly have been affected by the action of the external air. If you take a rose-bud or bud of any other flower before it expands, and strip it of its external covering, you will find that the petals and other inclosed parts of the fructification are as completely furnished with their epidermis as any other parts of the plant, and yet they have never been exposed to the action of the air. The same may be said of the epidermis of the seed while yet in the seed-vessel, or of the root, or of the stem of the paper birch, which still continues to form and to detach itself, though the interior layers are defended from the action of the air by the layers that invest them.

* Traité d’Anat. et de Phys. Veg. i. 87.
In herbs, and in the temporary parts of woody plants, such as the leaves and flowers, the epidermis never detaches itself at all; which circumstance M. Mirbel adduces as an additional argument in favour of his hypothesis. But to me it seems an argument against it. For, if the air produces such violent effects upon the trunk and branches of woody plants, why does it not produce similar effects upon other plants, or upon other parts of the same plant? And why is the epidermis of the leaf, flower and fruit incapable of being again regenerated, if accidentally destroyed? Till a satisfactory answer can be given to these inquiries, that shall be at the same time compatible with the supposed action of the air in other cases, it is impossible to admit the hypothesis of M. Mirbel.

But so far is the action of the external air from being the cause and origin of the epidermis, that it is even detrimental to its formation. For the re-production of a part that has been accidentally destroyed, in cases capable of re-production, is always more easily effected if the wound be covered closely up*. And hence it is extremely improbable that the epidermis is merely a modification of the external surface of the parenchyma effected by the influence and action of the air; if rather it is not evidently an organ formed by the agency of the vital principle, even when the plant is yet in embryo, for the very purpose of protecting it from injury when it shall have been exposed to the action of the air in the process of vegetation.

Accordingly the development of the epidermis is found to keep pace with that of the plant which it invests, so that it "grows with its growth and strengthens with its strength," expanding in all its dimensions, and accommodating itself with wonderful facility to the augmentation of the inclosed parts, as may be seen in the case of trees and fruits of rapid growth. Its

* Senebier, Phys. Veg. i. 154.
the Formation of the Vegetable Epidermis.

expansion is circumscribed, however, by certain bounds or limits which it cannot pass. For, when it has become indurated with age, or when vegetation is too luxuriant, it refuses or is unable to expand further, and consequently bursts. But if it does not burst spontaneously, where it does not expand freely, it is then thought to check or retard the growth of the plant, by operating as a sort of tight roller or bandage; as may be exemplified in the case of the cherry-tree, the epidermis of which the gardener is often obliged to lay open by means of a longitudinal incision, in order to facilitate the growth of the parts inclosed.

With regard to the disavowed analogy between the animal and vegetable epidermis, it is of no consequence to the above argument whether it holds good or not. But there are several important respects in which an analogy between the two cuticles is sufficiently striking. They are both capable of great expansion in the growth of the subject. They are both easily regenerated when destroyed, (with the exceptions above stated,) and seemingly in the same manner. They are both subject, in certain cases, to a constant decay and repair; and they both protect from injury the parts inclosed. Whence we feel ourselves entitled to draw a conclusion directly the reverse of that of M. Mirbel, namely, that the epidermis of the vegetable is not an accidental scurf formed on the surface of the parenchyma by means of the action of the air; but a distinct and individual organ formed by the agency of the vital principle, at the period of the generation of the plant, and destined to the discharge of peculiar functions in the vegetable œconomy, as well as exhibiting a close analogy to the epidermis of the animal.

Stow Maries, Dec. 22, 1814.
III. On the Classification of the Natural Tribe of Insects Notonectides, with Descriptions of the British Species. By William Elford Leach, M.D. F.R.S. and L.S.

Read April 4, 1815.

Before laying down the characters of this interesting and natural tribe of insects, it may not be deemed improper to give a very short account of what has been done by preceding entomologists.

Linné and all his predecessors comprehended the species under the generic appellation Notonecta. The accurate Geoffroy was the first who separated Notonecta into two genera, which have been adopted by most succeeding writers, excepting Linné, who in the last edition of his Systema Naturae has merely given the synonyms of that author, without taking the least notice of the important characters which induced him to separate them.

De Geer confounded the animals of this tribe with Nepa and Naucoris, whilst Latreille and Olivier placed them in a division of their family Hydrocorisae.

In the Edinburgh Encyclopedia I separated them from the Hydrocorisae, and placed them in a particular tribe, named in that work Notonectides, which term I shall adopt in the following little essay.
Dr. Leach’s Classification of the Notonectides.

Ordo. HEMIPTERA*.
Subordo. HYDROCORISÆ. Insecta aquatica, antennis minutissimis.

Tribus 2. NOTONECTIDES.
Pedes duo postici longiores, natatorii.

Fam. I.
Corpus cylindrico-ovatum, aut ovato-quadratum. Tarsi omnes biarticulati. (Scutellum magnum.)

Gen. 1. NOTONECTA.

Gen. 2. PLEA.

Fam. II.
Corpus depresso-cylindricum. Tarsi antici uniarticulati; quar tuor postici biarticulati. (Elytra margine antico ad basin saltem canaliculato.)

Gen. 3. SIGARA.

Gen. 4. CORIXA.

* In the Edinburgh Encyclopedia I have divided the HEMIPTERA of Latreille into HE MIPTERA and OMOPTERA, which Latreille considered as two great divisions of one order.

Fam.
Dr. Leach’s Classification of the Notonectides.

Fam. I.

All the insects of this family swim on their back, moving by means of their long hinder legs, which resemble oars; whence they have been aptly named boat-flies.

Gen. 1. Notonecta.

Besides the characters given in the above table, the following will be useful in order to enable the young entomologist to distinguish this genus from Plea, from which it has not been separated by any entomologist*.

The thorax is hexagonal, the anterior part is much attenuated, and the hinder margin is straight. The head is narrower than the broadest part of the thorax; the eyes are oblong, and converge a little behind; the hinder legs are much ciliated, and the claws are so minute as to be discovered with great difficulty; the tips of the elytra are notched.

Spec. 1. Notonecta furcata.

—— Syst. Rhyng. 102. 2.

Var. β. Elytris maculâ ferrugineâ.
Habitat in Caledoniæ, Angliæ aquis vulgatissime.
Obs. Elytra apice fuliginosa; dorsum nigrum.

Spec. 2. Notonecta maculata.
N. elytris fusco ferrugineoque variis, dorso ferrugineo fasciâ mediâ pernigrâ.

—— Syst. Rhyng. 103. 4.

* In the Genera Crustaceorum et Insectorum, tom. iii. p. 150, the accurate Latreille has detailed the principal characters of Plea, which he considered as a species of Notonecta.
Dr. Leach's Classification of the Notonectides.


*Habitat* in Angliâ prope Bristol, Plymouth, et Exeter.
Elytra apice fuliginosa.

Spec. 3. *Notonecta glauca.*

N. elytris griseis margine fusco-punctatis, dorso nigro apice pallido.
Notonecta glauca *aurorum.*
Var. β. Elytris subferrugineis fusco-subirroratis.
Var. γ. Elytris apice subnebulosis.
Var. δ. Elytris pallidis immaculatis.

*Habitat* in Britannia vulgarissime.

This species is by far the most common that occurs in Great Britain. The back of the abdomen is always black, terminated with pale yellow. Var. β at first sight bears a near resemblance to *N. maculata*; but the spots in the front of the elytra, and the colour of the back, will readily distinguish them. Var. γ I twice received from Mr. S. W. Millard, who took them near Bristol. Var. δ I found in the north of England, and I suspect it to be an immature specimen. All the varieties, excepting the last, have a small blackish spot on the hinder margin of the elytra; but it is much more distinct in some specimens than in others, and it is never to be seen in *N. maculata*; this affords another character for discrimination, and therefore ought not to remain unnoticed.

Gen. 2. Plea.

The thorax is obscurely hexagonal, with the hinder margin prominent and rounded; the head as broad as the broadest part of the thorax; the eyes are rather oblong, without the least tendency to converge behind; the hinder pair of legs not more ciliated than the others, but are terminated by very strong and distinct claws; tips of the elytra acuminated and entire.
Dr. Leach's Classification of the Notonectides.

Spec. 1. *Plea minutissima.*

*P.* grisea, fronte linea fuscâ, thorace elytrisque subtilissime punctatis.

Notonecta cinerea, anelytra. Geoffroy Ins. Par. i. 477. 2.

—— *Syst. Rhyng.* 104. 10.

Long. Corp. 1½ lin.

*Habitat* in aquis stagnantibus prope Londinum vulgarissime.

This species has been considered by Geoffroy, Fabricius, and Olivier, as *Notonecta minutissima* of Linne, which reference undoubtedly belongs to the following species; viz. to *Sigara minutissima*.

Whether *Notonecta minutissima* of Panzer (*Fn. Ins. Germ. In.* ii. 14.) be intended for this species, I cannot take upon myself to decide, as his figure indicates a deep notch in the hinder margin of the thorax, which I have not been enabled to detect in any specimens; his figure must therefore be incorrect, or be intended for a distinct species from the one in question.

Geoffroy has described the larva, never having seen the perfect insect.

Fam. II.

Gen. 3. *Sigara.*

The characters already given sufficiently distinguish this from the two preceding genera.

Spec. 1. *Sigara minutissima.*

*S. supra cinerea, elytris fusco obsolete maculatis, subtus pedibusque flavis.*

Notonecta
Dr. Leach’s Classification of the Notonectides. 15

Notonecta minutissima. Linn. Fn. Sv. 244. 905.
—— Syst. Nat. i. 713. 3.

Habitat in rivis, lacubus vulgatissime.
Long. Corp. 1 lin.

Linné has described this species so minutely as to leave no doubt with respect to the above reference; in the twelfth edition of his Systema Natureæ, and in the last edition of his Fauna Suecica, he has given the following characters: “N. elytris cinereis; maculis fuscis longitudinalibus. Magnitudo minima arenulæ; depressa est. Pedes posteriores longiores; primum par minimum. Habet alas, elytra, scutellum.”

Sigara minutissima is found in every part of Great Britain; I have observed it in the Lake of Killarney, and in other lakes in the south of Ireland; in the north of England, near Carlisle, and in Derwentwater; in Loch Lomond and Loch Katerine in Scotland; in the river Tavy in Devon; and I have frequently received it from the Norfolk collectors: whence we may infer that it occurs in that country.

To this genus probably belongs the Sigara coleoptrata of Panzer, Faun. Ins. Germ. In. 50. 24.

Gen. 4. Corixa.

The thorax is more or less produced behind in all the species of this genus; but it is not evident in the first division of the genus until the elytra have been elevated. The front, the under parts of the body, and the legs, in all the British species, are yellowish.

* Elytris ad apicem subgradatim acuminatis.

The channel on the anterior margin of the elytra in this division is uninterrupted, and gradually disappears before it reaches to the extremity of the elytra.
Dr. Leach’s Classification of the Notonectides.

C. thorace rufo-griseo, elytris sublutescentibus: maculis longitudinalibus nigricantibus.
Habitat in Norfolciæ aquis prope Norwich.

Although the character by Fabricius does not accord with that given above, yet as he drew his description from a museum specimen (which generally assumes the colour he mentions) I give his synonym without any hesitation; but this insect is distinct from the Sigara coleoptrata of Panzer, which is figured with a scutellum, and most probably belongs to the genus Sigara as mentioned above.

** Elytris ad apicem subrotundatis.

The channel in the fore part of the elytra, at about two-thirds from its commencement, is interrupted by an oblique transverse elevated line, and it terminates abruptly before it reaches to the apex of the elytron, and then it leaves the margin, inclining a little inwards or backwards.

a. Elytris thoraceque rugulosis.

Spec. 2. Corixa striata.
C. thorace elytrisque fuscis: lineolis flavicantibus transversis striatis, dorso nigro, lateribus flavidis.
Notonecta striata. Linn. Fn. Sv. 244. 904. Syst. Nat. i. 712. 2.
Habitat in aquis stagnantibus.


Spec. 3. Corixa stagnalis.
C. fusca, thorace lineolis transversis numerosissimis flavicantibus, elytris fuscis flavido irroratis.

Habitat
Dr. Leach's Classification of the Notonectides.

Habitat in aquis stagnantium putridis vulgarissime.
Elytra fusca flavido-irrorata; margine anteriore flavido; margine postico basin versus flavido-lineato. Dorsum fusco-nigricans.

This species is about half the size of C. striata.

Spec. 4. Corixa fossarum.

C. fusca, thorace lineolis sex transversis flavidis, elytris fuscis flavido-irroratis.
Habitat in fossis passim.

Spec. 5. Corixa lateralis.

C. albida, thorace lineolis septem nigris, elytris nigro-irroratis: margine antico immaculato.
Habitat in fluviis.
C. fossarum paululum minor. Dorsum atrum, lateribus flavis.

Spec. 6. Corixa dorsalis.

C. flavida, thorace margine lineolisque sex transversis nigris, elytris nigro-irroratis: margine antico immaculato.
Habitat in fluviis vulgarissime.
C. stagnali paulo major. Dorsum flavum.

b. Elytris thoraceque glaberrimis, laxibus.

Spec. 7. Corixa Geoffroyi.

C. flavida, thorace lineolis transversis numerosissimis nigris, elytris nigro-irroratis: dorso pernigro apice flavido.

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_Habitat_ in aquis stagnantibus vulgatissime.

All authors have considered this species as _Notonecta striata_ of Linné, although it will not agree with his character. It is figured by Geoffroy and Panzer, and is of the former author the species serving as the type of the genus _Corixa_.

Spec. 8. _Corixa affinis._

_C. flavida_, thorace lineolis transversis numerosissimis nigris, elytris nigro-irroratis: dorso pernigro; lateribus postice dentato-flavis.

_Habitat_ in stagnis prope Plymouth haud infrequens.

_C. Geoffroyi_ duplo minor.
IV. Some Remarks on the Natural History of the Black Stork, for the first time captured in Great Britain. By George Montagu, Esq. F.L.S.

Read May 2, 1815.

ARDEA NIGRA. Linn.

Black Stork.

Most ornithological writers mention this bird as an European species, less common than the White Stork, and of a more solitary disposition. Its latitudinal range in its periodical migrations is apparently greater than that of the white species, since it is said to visit Russia and Siberia, and also to pass over Sweden in the spring in vast flocks, flying towards the extreme north, and soaring to so great a height as to appear no larger than a sparrow.

From innumerable observations it is evident that migrative birds are much more confined in their longitudinal range than in their latitudinal: hence it is that many species pass through France and Germany in the spring, and return in the autumn, which by no chance have as yet been ever observed to wander into this country, although they proceed much further north than any part of Britain. Others, from accidental causes of which we have no certain knowledge, occasionally vary a little from their natural course, and are found solitary in this country. Of this I have the pleasure of announcing an example in Ardea nigra, the only instance I believe of its being found at large in Great Britain.

This
This bird was captured by means of a slight shot-wound in the wing, without breaking a bone, and is now in my possession in excellent health. To my scientific friend, Mr. Austin of Bridgewater, naturalists in general, and myself in particular, are indebted for this addition to the British Fauna, he having rescued it from plebeian hands, where in all probability the circumstance would have been consigned to oblivion. It was shot in West Sedge-moor, adjoining the parish of Stoke St. Gregory, Somersetshire, on the 13th of May 1814; and what is remarkable, another very rare bird, the White Spoonbill, was shot on the same moor, by the same person, in November of the preceding year.

When first the Black Stork was observed, it was searching for food by the side of a drain, and when approached flew a considerable distance; but in a second attempt the fowler got sufficiently near to slightly wound it. It made little resistance, and on the following day ate some eels that had been placed near it. I was greatly rejoiced to receive this interesting bird alive from Mr. Austin, as its manners do not seem to be much known. Like the White Stork, it frequently rests upon one leg; and if alarmed, particularly by the approach of a dog, it makes a considerable noise by reiterated snapping of the bill, similar to that species. It soon became docile, and would follow its feeder for a favourite morsel, an eel. When very hungry it crouches, resting the whole length of the legs upon the ground, and supplicantly seems to demand food, by nodding the head, flapping its unwieldy pinions, and forcibly blowing the air from the lungs with audible exspirations. Whenever it is approached, the expulsion of air accompanied by repeated noddling of the head is provoked. The bird is of a mild and peaceful disposition, very unlike many of its congenera; for it never makes use of its formidable bill offensively against any of the companions of its prison, and even submits peaceably...
peaceably to be taken up without much struggle. From the manner in which it is observed to search the grass with its bill, there can be no doubt that reptiles form part of its natural food; even mice, worms, and the larger insects, probably add to its usual repast. When searching in thick grass or in the mud for its prey, the bill is kept partly open: by this means I have observed it take eels in a pond with great dexterity: no spear, common in use for taking that fish, can more effectually receive it between its prongs than the grasp of the Stork’s open mandibles. A small eel has no chance of escaping when once roused from its lurking-place. But the Stork does not gorge its prey instantly like the Corvorant; on the contrary, it retires to the margin of the pool, and there disables its prey by shaking and beating with its bill, before it ventures to swallow it. I never observed this bird attempt to swim; but it will wade up to the belly, and occasionally thrust the whole head and neck under water after its prey. It prefers an elevated spot on which to repose: an old ivy-bound weeping-willow, that lies prostrate over the pond, is usually resorted to for that purpose. In this quiescent state the neck is much shortened by resting the hinder part of the head on the back; and the bill rests on the fore-part of the neck, over which the feathers flow partly so as to conceal it, making a very singular appearance.

The Black Stork, perhaps, is not more delicate in its food than the white species: fish appears to be preferred to flesh, but when very hungry any sort of offal is acceptable.

All birds that pursue their migrative course by night in congregation, have undoubtedly some cry by which the whole assembly is kept together; yet it should appear that at other times the Black Stork is extremely mute: not a single note has been heard to issue from the bird in question since its captivity.

As
As there is a little variation in the plumage of my specimen of *Ardea nigra* from what has generally been described, and as the plumage when first captured indicated immaturity, being very different from what has been since assumed, I beg leave to subjoin a short description of three states of plumage.

The head and upper part of the neck speckled with pale brown of different shades, having a slight tinge of rufous, becoming darker on the lower part of the neck, the feathers being dusky in the middle: the back, scapulars, and coverts of the wings dusky-black, slightly margined with brown: quills and tail dusky-black, the latter glossed with green: the feathers on the lower part of the neck before pretty long and loose, hanging over the breast: from thence to the tail dingy-white. On the back were two or three feathers, apparently new, that were of a dark glossy green, indicating a change of plumage. This description was taken in June 1814, soon after the bird was captured. The bird continued very gradually to moult throughout the summer and winter, becoming much darker on the head and neck, and much greener on the back; and by the beginning of February 1815 the upper part of the head and back of the neck became dusky-black, glossed with green; the lower neck before dusky-black, and the whole upper part of the body, including wing-coverts and scapulars, dark shining green, similar in colour to that variety of the Glossy Ibis known under the title of *Tantalus viridis*. The under parts of the plumage continued as at first. The bill, which is full seven inches in length, has the upper mandible a trifle the longest, and deflects a little at the point: the colour is dusky-red, brighter at the base, and orange at the tip: irides light hazel: the lore and orbits bare of feathers, and of a dull red: the legs

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† Latham says greenish-grey, with a whitish tip.
and toes dull orange. These parts have changed but little, and perhaps are rather brighter in colour than at first.

Indisposition having prevented my seeing the bird since the last-mentioned period till the middle of March, I was much surprised to find the appearance of a few feathers on the upper part of the back, that were dusky, resplendent with violet and purple, having a margin of dark glossy green. These elegant feathers continued to increase in number, till the whole upper part of the back had nearly assumed this beautiful plumage by the first of April. At this time no other part of the bird indicated any further change of plumage: the scapulars and coverts, many of which had recently changed, continued of the same colour as last described, without the purple reflections or marginal green. It is scarcely possible to account for such a succession of change in plumage in so short a time, except by supposing that a change in the constitution of the bird, produced by captivity and a want of natural food, had caused obstruction to the usual course of moulting, and that the autumnal change had been retarded, and was scarcely effected before the spring moulting commenced. The bill at this season has also become more orange.
V. Some Account of the Tantalus Ephouskyca, a rare American Bird. By Benjamin Smith Barton, M.D. F.M.L.S.

Read June 6, 1815.

The annexed figure (Tab. I.) of a rare American bird, together with those very few facts and circumstances which I have been able to collect concerning the bird, may, I flatter myself, prove acceptable to the Linnean Society. It may be proper to observe, that although the drawing, by my friend Mr. William Bartram, has been in my possession for many years, no engraving has ever been made from it.

We know little or nothing of this bird, but what has been communicated to us by the ingenious gentleman just mentioned. I here subjoin all that he has said concerning it.

"There is inhabiting the low shores and swamps of this river*, and the lakes of Florida, as well as Georgia, a very curious bird, called by an Indian name, (Ephouskyca †,) which signifies in our language the Crying Bird. I cannot determine what genus of European birds to join it with. It is about the size of a large domestic hen. All the body, above and beneath, is of a dark lead colour, every feather edged or tipped with white, which makes the bird appear speckled on a near view: the eye is large, and placed high on the head, which is very prominent: the bill or beak is

* The St. Juan, in East Florida.
† "Tantalus pictus." In another part of his work (p. 293.) Mr. Bartram mentions our bird by the same name.
Tantalus Epheskyca.
Dr. B. S. Barton's Account of the Tantalus Ephouskyca.

five or six inches in length, arched or bent gradually downwards, in that respect to be compared to one half of a bent bow: it is large or thick near the base, compressed on each side, and flatted at top and beneath, which makes it appear four-square for more than an inch, where the nostrils are placed, from whence to their tips both mandibles are round, gradually lessening or tapering to their extremities, which are thicker for about half an inch than immediately above, by which the mandibles never fit quite close their whole length: the upper mandible is a small matter longer than the under: the bill is of a dusky green colour, more bright and yellowish about the base and angles of the mouth. The tail is very short, and the middle feather the longest: the others on each side shorten gradually, and are of the colour of the rest of the bird, only somewhat darker: the two shortest or outermost feathers are perfectly white, which the bird has a faculty of flitting out on either side as quick as a flash of lightning, especially when he hears or sees any thing that disturbs him, uttering at the same instant an extreme harsh and loud shriek. His neck is long and slender; and his legs are also long, and bare of feathers above the knee, like those of the bittern, and are black, or of a dark lead colour*.

It will be evident, I think, from an inspection of the drawing, that the Ephouskyca is a species of the genus Tantalus or Ibis; a genus of which America produces many species, several of which are now known to be natives of the United States. I cannot, however, find that the "Crying Bird" is noticed by any of the European ornithologists. I am pretty sure that it is not one of the nineteen species described by Mr. Latham in his General Synopsis of Birds. I may add, that our bird has entirely escaped

* Travels through North and South Carolina, Georgia, East and West Florida, &c., by William Bartram, pp. 147, 148. Philadelphia, 1791.
Dr. B. S. Barton's Account of

the notice of the late Mr. Wilson, author of the American Ornithology. This gentleman has noticed only three species of the genus Tantalus, viz. Tantalus Loculator, or Wood Ibis; T. ruber, or scarlet Ibis; and T. albus, or white Ibis. I think it highly probable that the two last birds are really one and the same species.

I am fully sensible how imperfect are these notices: but I have not hitherto been able to obtain any thing more satisfactory on the subject, though I have for several years endeavoured, through the medium of my correspondents in the country of the Muscogulge, or Creek-Indians, to obtain a specimen of the bird. I have no doubt that I shall ultimately be successful in my researches. In this case, I shall not fail to communicate something much more satisfactory on the subject to the Linnean Society, whose pursuits are at all times highly interesting to me.

I shall only further observe at present, that should the Crying Bird prove to be a new species of Tantalus (I mean a species not noticed by any systematic ornithologist), it may be well to call it Tantalus Ephouskyca. This, I have already observed, is its Indian name, the literal meaning of which has been mentioned. Ephous, or Ephaus, in the language of the Creek Indians, signifies a bird.—Nor will those who are well versed in the study of the oriental languages, fail to observe how close is the affinity between this word and the word for bird in the language of the ancient Chaldeans: I may add, even in the Hebrew. That this affinity is not accidental, will appear more probable from what I am now to state; that the Creek and other North-American languages contain many words that are most palpably derived from the Chaldaic, Hebrew, Persian, &c.*

There is no reason to believe that the Tantalus Ephouskyca has

ever been seen in the United States, to the north of Georgia, or at least of the Carolinas. In page 293, Mr. Bartram mentions it as one of those birds which are natives of Carolina and Florida, and continue the year round in those countries. I have no doubt that we shall find our Tantalus in Cayenne, and other parts of southern America. I have elsewhere shown that the American animals have a great geographical range.

B. S. BARTON.

Philadelphia, July 10, 1814.
VI. Observations on the Orchis militaris of Linnaeus. By Mr. J. E. Bicheno, F.L.S.

Read June 20, 1815.

The very near affinity which orchideous plants have to each other has rendered their separation into genera and species a matter of great difficulty. Scarcely any tribe, however, has been more effectually changed, or received greater improvements since the time of Linnaeus, than this; and in support of the fact, we need only refer to the labours of Swartz in Sweden, and of Brown in our own country. No species required an elucidation more than the Orchis militaris; for Linnaeus has introduced so many varieties, and they are so badly supported by synonyms, that it is difficult, sometimes impossible, to make out what he means. It is to be feared that English botanists in general have not understood them, and that they have still further perplexed the subject. My object, therefore, on the present occasion is to point out what I conceive to be the English species, which have been called, since the time of Linnaeus, by the name of Orchis militaris. Of these there are three: the Orchis fusca of Curtis; the Orchis militaris of English Botany, vol. xxvii. t. 1873; and the Orchis tephrosanthos of Willdenow and Swartz. The synonyms which I am enabled to ascertain are not numerous, because I am situated far from the rich libraries of the metropolis; but even if I could command them, I believe I should not be disposed to quote largely, since it is almost impossible to identify these plants in the old authors, unless
less the description is accompanied with a figure. It will facilitate our inquiries if we examine each of these species separately, beginning with Orchis fusca.

There is less difficulty in identifying this species and tracing its synonyms than in either of the other two. Linnaeus, misled by the uncharacteristic and formal figure of Dillenius in Ray's Synopsis, t. xix. f. 2. has made two varieties of it, \(\beta\) and \(\delta\); and Hudson is the first author, adopting the Linnean system, who made it distinct under the name of purpurea. He, however, united it again with militaris in the second edition of his Flora. Jacquin clearly defined the plant; and his opinion was followed by Murray, Hoffman, Roth, Willdenow, Swartz, and most of the continental botanists. Curtis also has well distinguished it in his Flora Londinensis. Withering, in the second edition of his Arrangement, has made it a variety, but says he had not seen it. Sir James Smith in his excellent Flora Britannica has done the same, but has followed Linnaeus too closely; and, if his synonyms be correct, has included three English species, and we believe a foreign one, in his militaris: O. tephrosanthos, O. militaris, Eng. Bot. vol. xxvii. t. 1873, O. variegata (the fig. 22, 23, and 24, of Vailant being this plant), and O. fusca. The error in the first volume of English Botany, where fusca is called militaris, is corrected in a later volume, to which we have referred; and another plant is admitted, though unwillingly, as the \(\alpha\) intended by Linnaeus.

The earliest notice we have of this as an English plant is to be found in Gerard, p. 166; where he informs us that it grows in many places in Kent with the Bee and the Fly Satyrions, and among the rest “upon the hills adjoining to a village named Greenhithe,” the very place referred to by James Sherard in Dillenius’s Ray, and where it is frequently found at present. This information
information Gerard communicated of the *Ornithophora candida*, 165, or Butterfly Orchis; but the figure is *Orchis fusca*; and there is little doubt but that this was intended, since Johnson corrects the synonym in his edition, and complains greatly of the transposition of the figures in the chapter in which this plant stands. Caspar Bauhine, too, refers to this *icon*, excluding the synonym, under his *Cynosorchis militaris major*, which is unquestionably our present plant. Johnson’s *Orchis Strateumatica*, p. 215, is an improved figure, and is copied in Parkinson’s *Theatrum Botanicum*, p. 1344. no. 6. The description of the flower is significant enough, being like the “body of a man with his hands and legs cut off.” Dillenius is the next author who takes notice of it as an English plant (for Ray does not seem to have been acquainted with its being indigenous); and though his figure in the *Synopsis* is stiff and bad, his description is appropriate—“Galea obtusa atro-rubens minusque surrecta, qua nota a præcedente (*O. tephrosanthos*) distinguitur.” Vaillant, who understood the *Orchideæ* better than any of his predecessors, has given an excellent drawing of the flowers of this and others nearly allied to it; but it is curious that he should attribute to its flowers an insupportable smell of the goat, while Curtis says they have a strong smell, somewhat like, but not so pleasant as, *Anthoxanthum*. Blackstone is the last English author of the old school, who seems to have been acquainted with it, having found it plentifully “in the old chalk-pit near the paper-mill at Harefield.” Since his time it has been gathered frequently in the fine chalky districts of Kent and Middlesex; but we do not know that it is found beyond these counties. Haller in his *Hist. t. 31*, and Curtis *Flor. Lond. fasc. 6. t. 64.* have given superb figures of it.

This *Orchis* surpasses all its English congeners in size and grandeur, and may be known by the lip of the nectary being divided into three segments, the two lateral ones being linear, and the middle
middle one broad, bilobed, generally with an intermediate tooth. The middle segment varies in the depth of its fissures, so that many authors have described the lip as four-cleft, and others as five-cleft; but, when this is the case, the segments are never so regularly linear as in the following species, and they are notched; and, besides, the petals are broader and not nearly so acuminate.

**Orchis militaris. Eng. Bot. t. 1873.**

Though this plant is figured by the old herbalists Gerard, Johnson, and Parkinson, it does not appear to have been noticed as a distinct species by any English writer, until it was taken up by Sir J. E. Smith in the 27th volume of *English Botany.* In this work, however, it is confounded with another, the *O. tephrosanthos* of Swartz. The figure which Johnson gives of it, p. 216, no. 13: is a tolerable similitude, and leaves little doubt as to what he intended. Parkinson has copied it, p. 1344, no. 8, and has added another of a most fanciful and ridiculous kind, p. 1347, which seems to have had its origin in this species or the following. Merett in his *Pinax* tells us that Mr. Brown, one of the authors of the *Catalogus Oxoniensis,* and whom he calls in his preface "vir exercitatissimus et eruditissimus," found three *Orchides* "near the highway from Wallingford to Reading, on Barkshire side the river.


3. Orchis oreades trunco pallido, brachiis et cruribus sature rubescentibus."

The *O. militaris, E. B. t. 1873* and *O. tephrosanthos* are probably intended by these descriptions, since the former is found at

*This reference to Bauhine I do not understand thoroughly, but suppose it to refer to his *Orchis flore nudi hominis effigiem representans, mas.—Pin. p. 82.*
the present day in the neighbourhood of Streatley and Pangbourne, answering exactly to the situation which Brown describes; and the latter is said to grow there, and at Caversham in the neighbourhood, on the authority of the same Mr. Brown, in Ray’s Catalogus Plantarum.

Vaillant has given the figure of a flower, t. 31. f. 21. which he regards as only a variety of fusca, and says he gathered it on the same spot with O. tephrosanthos; but we are inclined to believe it belongs to this species. Ray’s Orchis anthropophora altera, Hist. Plant. 1218, seems to answer to it. From the reports we have received of the Harefield O. militaris, mentioned by Blackstone as growing with the fusca, we suspect it to belong to this species rather than to the following. Haller’s t. 28. is somewhat doubtful.

Willdenow’s specific character, and consequently that of the Hortus Kewensis, does not accord with the English plant; for the middle segment cannot be called bilobed, nor are the bracteas, upon which the editor of Linnaeus places his chief dependence, obsolete. The reference to Vaillant also leads me to suspect it, t. xxxi. f. 24., as well as f. 22. and 23., being O. variegata. The bracteas, however, vary so much in shape in the dried specimens of all the three plants, from the circumstance of the point being caducous, that we ought not, perhaps, to rely too much on the character drawn from this appendage. Should Willdenow’s species be found to be distinct, it will be necessary to give our plant a new trivial name; but we leave this to be ascertained by those who have foreign specimens at hand, and who can refer to the figures which he has quoted.

The chief character of our plant is the regular linear incurved segments of the lip, which are broader than in tephrosanthos, and not notched and ragged as in fusca, but much narrower. The flowers grow in a dense spike, which old Gerard describes as ash-coloured.
on the Orchis militaris.

Orchis tephrosanthos.

This plant is well figured in the first and second editions of Gerard, p. 156, no. 1. p. 205, no. 2. though under a different name in each, and copied from them into Parkinson, p. 1344, no. 4. These old authors, however, do not mention it as found in England. The earliest information we have of this fact, if we except the allusion to it by Merett, already stated, is recorded in Ray's Catalogus Plantarum, where we learn that it was discovered by Mr. Brown on "the hills by the river Thames, near Cawsham-Bridge, a mile from Reading, and on several other hills on the other side the water towards Wallingford." This last habitat is omitted in the first edition of the Synopsis. Ray tells us in his Journey on the Continent, that he found it near Geneva, and that he had recently observed it in England; and yet it might be suspected that he never gathered it himself at Caversham (the modern name) in Oxfordshire, since he records the place in Gibson's Camden as being in Berkshire. It is found at present on the rising ground among the bushes to the west of the great chalk-pit facing the river Thames; but it is an uncertain plant, like many other Orchideae, being found some years very abundantly, and then altogether as sparingly. The two habitats quoted in Flora Britannica, from Ray and Sibthorp, for this plant, are the same spot. That this is the tephrosanthos of Willdenow there can be no doubt. It takes its trivial name from the ash-coloured spike; but this would have been equally applicable to Bauhin's plant, Orchis galea et alis cinereis, Hist. ii. p. 755, which seems not to belong to it, though quoted by Ray, but to O. militaris of Eng. Bot. or of Willdenow.

It might have been supposed that Withering, in his second edition of the Arrangement, intended our present species by his ϑ, since he has uniformly quoted synonyms and figures which refer
to it; but the description is evidently drawn up from a foreign species, probably *O. variegata*, and the references are all transferred in the succeeding edition to another variety. This is ε of Linnaeus.

This plant is easily known by the narrow segments of the lip, and the acuminate petals. It is a delicate, smaller plant than the other two, flowers early in May, and has a remarkably abrupt termination in the spike of flowers. The lip of the nectary is less scabrous than in either of the others. Vaillant, t. 31. f. 25. 26. has well represented the flower; but we believe that no modern figure has yet been published of this rare plant.

VII. Glyphis
VII. Glyphis and Chiodecton, two new Genera of the Family of Lichenes, with Descriptions and Figures of the Species hitherto discovered. By Erik Acharius, M.D. F.M.L.S.

Read November 21, 1815.

Postquam fundamenta Lichenologiae jam pridem jeci* vel vera, ut opinor, principia constitui, spem mihi facio, fore neminem rei hujus intelligentem, qui negaverit, duo haec describenda genera, satis superque a reliquis omnibus distincta esse.

In dies increscere coepit Lichenum tam numerus antea incognitarum specierum, quam de earum proprietatibus et partium formis singularibus notitia. Quae harum detectarum divitiis superstructa est, scientia, specierum in plura genera distributionem necessariam reddidit; quando nempe characteribus essentialibus apprime convenientibus, fixis certisque, haec determinari possunt.

Inter eas species, quarum apothecia intra singularem et e propria substantia, nec a thallo formatam verrucam locata sunt†, distinctissimum inter reliqua a me stabilita, huc usque solum eminuit genus, quod Trypethelium vocatur‡. Species illae nuper detectae, quarum descriptiones et figuras Societati Linneanae Lon-

* Lichenographia Universalis, Göttinge 1810 edita c. Tab. color. collatis Praemonendis in Synopsi mea Methodica Lichenum, jam nunc typis exscripta et mox evulganda.
Dr. E. Acharius on
dinensi jam offerre animum induxi, cum Trypetheliis natura et
dispositione jam dictarum verrucarum et apotheciorum etiani
convenient, sed propriis simul dignoscuntur characteribus essen-
tialibus, quibus a Trypetheliis omnibus et singulis ita discedunt,
ut inter haec, salvo eorum charactere generico, recipi nequeant. 
Hæ notæ e sequentibus clarius apparebunt.

GLYPHIS.

CHARACTER GENERIS ESSENTIALIS.

Receptaculum universale crustaceo-cartilagineum p'ano-expan-
sum adnatum uniforme. Partiale verrucæformae, e propria
substantia colorata formatum. Apothecia subcartilagini-
eae subrotunda oblongiuscula elongataque supra denudata
impressa vel canaliculata (atra), in singula verruca plura
innata, intus homogenea.

CHARACTER NATURALIS.

Receptaculum universale. Thallus cartilagineo-membrana-
ceus, contiguus uniformis plano-adnatus, effusus l. limit-
tatus.

Receptaculum partiale. Verruca planiuscula, colore et sub-
stantia propria a thallo diversa, apothecia foevens. Apo-
thechia numerosa verrucæ propriae innata, ad ejus superfi-
ciem denudata, aggregata l. subconfluentia, diformia (sub-
rotunda, oblonga, elongato-linearia) supra impressa, disco
planiusculo; excavato l. subcanaliculato, in ambitu magis
elevata submarginata, solidiuscula atra, parenchymate ho-
mogeneo.

Obs. Singulare hoc genus, equidem tam ab Opegraphis et
Gyrophoris, quam a Trypetheliis distinctissimum, cum his tamen
generibus
generibus analogiam majorem habet quam cum reliquis e familia Idiothalamorum Lichenibus; sed singulæ ejus, quotquot sunt adhuc notæ, vel a me nunc primum detectæ species, notas quasdam proprias et essentiales offerunt, quibus ab omnibus aliis valde recedunt. E characteribus supra datis hæ etiam facile eruntur. In primis vero in eo differt genus Glyphis, quod, si verrucas apotheciorum, ut ita dicam, vel apothecium commune respicimus, hoc nec propria nec crustæ solidiori quadam membranula tectum sit, sed e substantia plus minus pulveracea et raro solidiuscula formatum, atque aliter quam thallus coloratum; quodque ipsa apothecia partialia, intra verrucas jam dictas pro maxima sua parte ad superficiem verrucarum denudata sint, atque loco thalamiorum globosorum perithecio et nucleo instructorum (ut in Trypetheliiis) tota quanta e parenchymate homogeneo atro compactiori, in aqua macerato versus centrum tantisper dilutius colorato, formata; figura aliquando rotundata, sæpissime oblonga, elongata ac linearia, disco depresso vel canaliculato, unde eorum ambitus elevatus, illum quasi marginatum reddit. Itaque differt Glyphis.

ab Opegrapha, Graphide et Gyrophora apotheciiis partialibus intra propriam substantiam verrucæformem (s. apothecium quoddam commune) aggregatis et receptis, nec non horum forma et interna structura diversa.

a Trypethelio: apotheciiis partialibus oblongis et lineariis, perithecio, ostiolo papillato, nucleoque destitutis.

a Chiodecto: forma et textura apotheciiorum partialium, atque eorum situ, præsentia disci et marginis.

Derivatur nomen generis a Græca voce γλυφις ob apothecium commune opusculum cælatum assimilans.

Locus: inter Lichenes Idiothalamos in ordine Hyperogeneorum, post Trypethelium.

Species.
Species.

1. **Glyphis labyrinthica.** Tab. II. fig. 1.

G. crusta fuscescenti-subolivacea; apotheciorum verrucis oblongis sordide albis plano-convexusculis pulverulentis, et disco apotheciorum elongatorum canaliculato nigro rimoso-subreticulatis.


Trypethelium labyrinthiforme. Ach. Sylloge nov. Lichenum ad Cl. Schrader pro ejus Diario Botan. missa.

**Habitat** in Guinea ad Sierram Leonam supra corticem arboris ignota, quam secum ad tulit Clariss. D. D. et Prof. Ad. Alzelius, incolis sub nomine Duffa obvenientis.

**Descri.** Crusta membranacea tenuis laevigata, sed ex eminentiis subjacentis corticis inæquabilis, e fusco et cinereo olivacea, late, ut videtur, et indeterminatim expansa. **Verrucae** apotheciorum rarius sparsæ, parum supra crustam elevatae subpulvinatae; supra planiusculæ, rotundatae, oblongæ, curvatae, difformes, in ambitu integerrima tenuissima, sordide albacantes et pulvere concolori suffusæ, rugis et rimis nigris frequentissimis tenuissimis profundis ramosis anastomosantibus et retieulatis secundum formam apotheciorum inclusorum notatae. **Apothecia** longiuscula et elongata linearia, intra substantiam albicantem verrucarum abscondita, vario modo flexuosa ibidemque confluentia, atra opaca, extus intusque et pulvere compacto solidiuscula, supra et ad superficiem verrucarum disco angustissimo profunde excavato canaliculata et inde marginibus elevatis parallelis acutiusculis, pruinæ albida verrucarum velatis, secundum longitudinem cincta, rimas verrucarum nigras decussantes formantia.

**Obs.** Pauca tantum rarissimæ hujus speciei individua, nec nisi in unico corticis frustulo majori frequentia inveni, licet quam-
Glyphis and Chiodecton.

quamplurimas alias cortices in eodem loco a se collectas scrutini- nio meo benevole concesserit amicissimus AFZELIUS.

Explicatio Icon. Tab. II. fig. 1.—a. Corticis frustum hujus Lichenis crusta obductum, in quo verrucae apotheciorum sparsae, magnit. nat.—b. Duæ verrucae supra visæ multum auctæ.—
c. Particula thalli in quo verruca et ejus apothecia inclusa horizontaliter resecta representantur, ut structura et color internarum harum partium videatur, magn. valde aucta.—d. Particula corticis cum crusta et verruca apotheciorum ad perpendiculum dissecta.

2. Glyphis tricosa. Tab. II. fig. 2.

G. crusta ferrugineo-lutescente; apotheciorum verrucis planis difformibus cinerascentibus, e disco apotheciorum elongato-rum rimoso-canaliculato rugoso-gyrosis.


Habitat in India (Occid.?) ad corticem arboris ignotæ. SWARTZ.

Descr. Crusta in specimine a me viso effusa contigua cartilagino-membranacea læviuscula lutescenti-brunnea s. pallide-ferruginea. Verrucae apotheciorum parum supra crustam elevatae planæ irregulares, intus extusque cinerascentes, maculas quasi difformes dispersas et approximatas formantes; ob copiam apotheciorum nigrorum e cinereo et nigro variegatae ac gyrosae. Apo-thechia verrucis immersa figura variant subrotunda oblonga et longiuscula, plurima autem valde elongata linearia flexuosa, confer-tissima, intus extusque solidiuscula atra opaca, disco concaviusculo l. rimoso-canaliculato et marginibus parum elevatis tenuio-ribus integris l. tenuissime crispis ac flexuosis, ad superficiem verrucarum prominulis nudis instructa, unde hae supra rugoso-gyrosae apparent. Extra ipsas verrucas non raro extenduntur quædam ex apotheciis longioribus et crustam percurrunt; formam et ambitum verrucarum perquam irregularem reddentia. Intra verrucas
verrucas apothecia confertissima aggregata et singulari modo invicem complicata, congeriern vermiculorum curvatorum atrorum assimilantia, nec tamen inde in hae specie concreta vel confluentia ut in Glyphide labyrinthica.

OBS. Fugitivis oculis inspecta similitudinem quamdam habet haece species cum Trypehelio anomalo, inque ejusdem arboris cortice obveniente, sed attentius examinata facile ab hoc dignoscitur. Præsentia verrucarum propriarum et natura apotheciorum quantum ab Opegraphis, Graphidibus et Gyrophoris discedat nostra species unicumque patet.

Explic. Icon. Tab. II. fig. 2. a. Crusta et verrucae quædam hujus speciei in corticis frustulo, magn. naturali.—b. Particula crustae resecta cum apotheciorum verrucis binis supra adspectis, magn. aucta.—c. Verruca alia in particula crustae una cum apothecius inclusis horizontaliter dissecta, ut harum conformatio intra eam conspici queat.—d. Sectio perpendicularis verrucae cum apotheciiis, crusta et corticis. Figg. c. et d. magnopere auctæ.

3. Glyphis cicatricosa. Tab. II. fig. 3.

Trypehelium cicatricosum. Ach. in supra dicta Sylloge.

Descr. Crusta tenuis membranaeea laevigata e fusco cinerascens, in statu perfecto lineola nigra serpentina limitata. Verrucae apotheciorum sparsae parvae, parum a crusta elevatae plane intus
intus extusque nigricantes vel obscure cinereæ {olidiusculæ}, in ambitu plerumque lobato-crenatae et e pruina cinerea ibidem sordide albicantes, per ætatem vero evanescente. *Apothecia* ipsa fere tota intra parenchyma verrucarum abscondita, solo disco ad earum superficiem perceptibili, minus numerosa quam in reliquis speciebus, latiora et breviora quam in duabus praecedentibus, jam subrotunda, jam oblonga et vix unquam triplo longiora quam lata, atque sub hac forma parum curvata, disco aliquantum depresso l. concaviusculo, margine obtuso tantillum elevato integerrimo cincto; quam ob causam verrucæ supra quasi cicatricibus nigris inustis notatae videntur. Eleganter et in modum rosulæ in quamplurimis verrucis dispositi observantur apotheciorum disci, uno scilicet centrali et cæteris circumcirca hunc coronantibus.

**Observation.** Quoad habitum prope accedit ad *Glyphidem favulosam*, sed criteriis essentialibus ab ea prorsus diversa species manet: ut *Trypethelii* speciem in supra memorata *Sylloge*, cum Cl. Schrader communicata, inter alias etiam hanc dubitantem recensui.

**Explic. Icon.** Tab. II. fig. 3.—a. Pars rami *Codarii* cum crusta et apothecii hujus speciei, magnit. naturali. (In eodem ramo ad * delineata etiam occurrit Graphis tenella, nova species in Synopsi Lichen. p. 81, descripta.)—b. Lichenis crusta et apothecia in suis verrucis supra visa, magn. aucta.—c. et d. Verrucæ apotheciiorum seorsim cum particula crustæ cui adnascuntur desumtæ, supra visæ et magnopere auctæ, quarum una apothecia offert ad verrucæ superficiem subrotundata et oblonga concaviuscula atque inde marginata in formam rosulæ disposita; altera vero (d.) apothecia longiora et curvata absque ordine aggregata.—e. Sectio horizontalis ejusmodi verrucæ, apotheciiorum formam et dispositionem intra substantiam verrucæ exhibens.—f. Verrucæ et apotheciiorum inclusorum sectio perpendicularis, magn. insigniter aucta.

G. crusta albicante nigro-limitata; apotheciorum verrucis rotundatis planiusculis nigris glauco-pruinosis marginé cinerascentibus, et disco apotheciorum suborbiculāri excavato cicatricosis.


Trypethelium favulosum a me pridem appellatum, tam in *Actis Gorenkens.* vol. i. quam in *Sylloge Lichen.* Novor. supra memorata.

*Habitat in America ad corticem Crotonis Cascarillae.*

Descr. Crusta cartilaginea, crassior quam in antecedentibus speciebus, contigua lāvigata, ex eminentiis et fissuris corticis subjacentis parum inaequabilis ac diffraecta, sordide albecens, subinde pulvere albo adspersa, per aetatem e pallido-cinerascens vel parum fuscescens, in ambitu irregularis, lineola nigra repanda et serpentina in statu perfecto limitata. Verrucae apotheciorum supra crustam prominentes, subrotundae oblongae difformes, juvenes convexae pulvere albo-cinerascente l. glaucescente adspersae, vetustiores planae latiores, marginē elevato subintegro utplurimum cinereo-pulverulento cinctae, substantia interna carbonacea. Apothecia verrucis innata subrotunda aut aliquando oblongiuscula, ad superficiem verrucarum quamplurima aggregata, supra excavata, in ambitu elevata, unde distincte marginata apparent, foveolasque nigras seu cicatrices in superficie verrucarum efformant.

Obs. Descriptio in *Actis Gorenkens.* ob specimina minus bona, utpote vitiosa, secundum jam datam corrigi debet. Iconem novam etiam nunc dedi, quam forte incendio Moscoviae deleta est, quae ibidem incideretur.—Affinitas multa hujus speciei est cum Glyphide cicatricosa, a qua tamen abunde differt crustae natura ac colore, verrucis multo majoribus magis elevatis, nec non apothecis in his numerosioribus.

*Explic.*
Glyphis and Chiodecton.

Explic. Icon. Tab. III. fig. 1.—a. Lichen in cortice Cascarillae, magn. naturali.—b. Crustae frustum cum verrucis quibusdam, magn. aucta.—c. Verruca solitaria, supra visa, insigniter aucta. —d. Sectio horizonalis verrucae, substantiam ejus et apotheciorum inclusorum internam ostendens, magn. valde aucta.—e. Verruca cum parte subjacente corticis ad perpendiculum dissecta sub augmento adhuc majori.

CHIODECTON.

Character Generis Essentialis.

Receptaculum universale crustaceo-cartilageum plano-expanse adnatum uniforme. Partiale verrucaeforme e propria substantia colorata (alba) formatum. Apothecia subpulveracea subglobosa (atra), plura singulis verrucis inclusa subconfluentia, alia ad earum superficiem instar punctorum elevatorum notabilia.

Character Naturalis.

Receptaculum universale. Thallus cartilagineo-membranaceus, contiguus uniformis plano-adnatus, effusus 1. limitatus.

Receptaculum partiale. Verruca convexa 1. sphaerica, colore (albo) et substantia propria a thallo diversa, apothecia includens. Apothecia numerosa subglobosa, plurima intra substantiam verrucae proprie nidulantia aggregata et confluentia, alia pauciora ad ejus superficiem in modum papillarum punctiformium subprominentia, intus extusque subpulveracea atra.
OBS. Verrucas apotheciorum hujus generis si spectemus, natura sua a Trypetheliorum et Glyphidum parum recedunt; sed si formam et indolem apotheciorum inclusorum consideremus, haec in Chiodecti speciebus diversissima sunt et notas characteristicas validissimas essentiales offerunt, quibus hocce genus ab his et aliis satis distinctum sese praebet. Quoad verrucas ipsas, in notis speciebus, coloris sunt extus intusque albissimi et substantia earum bombycino-pulveracea. Intra hanc apothecia nidulantur minuta subglobosa vel parum difformia suboblonga, homogenea subpulverace atra, nullum nuclei seu parenchymatis solidioris texturam offerentia, tamen maceratione in aqua ad earum centrum substantia aliquantum pollicior in Chiodecto seriali observata est; de caetero in hac specie quasi concatenata, in altera ad centrum verrucæ adeo congesta ut massam pulveraceam simul sumta constituant. Versus superficiem verrucarum quædam etiam locata observantur apothecia, has supra quasi nigro-punctatas reddentia atque admodum spectabiles. Differt adeo Chiodecton a Trypethelio, Porina, Thelotremate et Variolaria, absentia thalami veri, nam neque perithecii et ostioli, neque nuclei vestigia in ejus apotheciis observantur,—in specie a tribus ultimis generibus: Verruca apotheciorum e propria nec e thalli substantia formata.

a Glyphide: situ, forma, et natura apotheciorum, nec disco nec margine instructorum atque omnino intra substantiam verrucarum nidulantium—a reliquis cognatis Lichenum Generibus, ut supra monui, praesentia apothecii communis seu verrucæ, a thallo haud formatae, Chiodectis, Glyphidibus et Trypetheliis solis solemnis, nec non forma et indole apotheciorum partialium.

A Graeca voce δέκτωρ receptaculum et χιός albus nomen generis composui.

Locus:
Locus: inter Lichenes Idiothalamos in ordine Hyperogeneorum post Glyphidem.

Species.

1. CHIODECTON sphaerale. Tab. III. fig. 2.

C. crusta effusa lacteo-pallescente tenuissime tuberculosa; apotheciorum verrucis subglobosis albissimis, apotheciis intus ad centrum earum in massam confluentibus.


Trypethelium pulcherrimum. Ach. in supra dicta Sylloge.

Habitat in America ad corticem Cinchone flavae dictae.


Expiic. Icon. Tab. III. fig. 2.—a. Hujus Lichenis crusta cum apotheciis in corticis frustulo, magn. naturali.—b. Particula Lichenis, magn. aucta.—c. Verruca fertilis separata a latere visa, multum aucta.—d. Alia supra adspecta, cincta particula crustae verrucosa, sub eodem augmento.—e. Verruca ad perpendiculum et.—f. Alia horizontaliter resecta, structuram et dispositionem apotheciorum intra has ipsas verrucas repræsentantes, magn. valde auctae.

2. CHIODECTON seriale. Tab. III. fig. 3.

C. crusta flavo-fuscescente laevigata nigro-limitata; apotheciorum
Dr. E. Acharius on

ciorum verrucis oblongo-difformibus convexiusculis, apothe-
ciis intus per series subconcatenatis.
vol. i. c. figg. inque Sylloge Novor. Lich.
Habitat in America supra corticem Bonplandiae trifoliatae
WILLD. (vulgo Angusture dictam.)

Descri. Crusta cartilagineo-membranacea læviuscula, e sub-
jacentis corticis irregularitate parum inæquilis seu eminentiis
levibus notata et diffrecto-rimosa, sordide flavescens, linea serpen-
tina nigra determinata. Verrucae apotheciorum sparsæ, primo a
crustae membrana subvelatae apparent, sed sæpissime denu-
datae occurrunt, parum supra crustam elevatae ac convexiusculæ,
demum planæ, albissimæ byssaceo-pulverulentæ, juniores ob-
longæ magis regulares, vetustiores difformes margine subrepanæ.
Apothecia oblongo-sphæroidea minuta subpulveracea vel in cen-
tro parum solidiora atra, et ad verrucarum superficiem sparsa,
quam nigro-punctatam reddunt absque signo papillæ genuinæ,
et intra substantiam verrucarum seriatiim disposita, flavedine
quadam parenchymatis verrucæ plus minus evidente circumdata.

Obs. Descriptionem speciei, quæ in Actis Gorenk. 1. c. ha-
betur, heic emendatam et correctiorem tradere debui, postquam
de partium natura et de genere ipso magis illustrati sumus.
Sub vitris compositis maxime augmentibus nullum intra apothecia
partialia nucleum verum detegere potui, quare etiam dubitanter
ad Trypethelii genus ibidem retuli, et licet apotheciorum verrucæ
et apothecia ipsa iconibus ad augmentum factis antea in Actis
hisce illustrata sunt, tamen superfluum esse non putavi, harum
partium figuras iterum fideliter tradere, ut comparatio specierum
evidentior fieret, in primis dum adhuc nescimus, an sub incendio

Explic.

Read December 19, 1815.

Sir,

Your remarks on the economy of the Sarracenia in your Introduction to Botany, led me to think of making this communication; and I was emboldened to undertake it from having observed in your prefatory remarks on the study of this science, a spirit of peculiar liberality and disinterestedness. My object is to lay before you the result of my observations on the insect-destroying-process carried on by the tubular leaves of these plants.

It will hardly be necessary to inform you that the Sarracenia flava and S. adunca (S. minor of Walter, and S. variolaris of Michaux,) grow in the flat country of this state in great abundance. With the latter my experiments have been chiefly conducted. If, in the months of May, June, or July, when the leaves of these plants perform their extraordinary functions in the greatest perfection, some of them be removed to a house and fixed in an erect position, it will soon be perceived that flies are attracted by them. These insects immediately approach the fauces of the leaves, and leaning over their edges appear to sip with eagerness something from their internal surfaces. In this position they linger; but at length, allured as it would seem by the pleasure of taste, they enter the tubes. The fly which has thus changed its situation, will be seen to stand unsteadily, it totters for a few seconds, slips, and
and falls to the bottom of the tube, where it is either drowned, or attempts in vain to ascend against the points of the hairs. The fly seldom takes wing in its fall and escapes; but this sometimes happens, especially where the hood has been removed to assist observation. In a house much infested by flies, this entrapment goes on so rapidly that a tube is filled in a few hours, and it becomes necessary to add water, the natural quantity being insufficient to drown the imprisoned insects. The leaves of the S. adunca and S. rubra of Walter might well be employed as fly-catchers; indeed I am credibly informed they are in some neighbourhoods. The leaves of the flava, although they are very capacious, and often grow to the height of three feet or more, are never found to contain so many insects as the leaves of the species above mentioned. The spreading fauces and erect appendices of the leaves of this species render them (I suppose) less destructive.

The cause which attracts flies is evidently a sweet viscid substance*, resembling honey, secreted by, or exuding from, the internal surface of the tube. On splitting a leaf it may readily be discovered in front, just below the margin, and in greatest quantity at the termination of the ala ventralis. From the margin, where it commences, it does not extend lower than one-fourth of an inch. During the vernal and summer months it is very perceptible to the eye and touch; and although it may be sometimes not discoverable by either, yet the sensation of sweetness is readily perceived on applying the tongue to this portion of surface. In warm and dry weather it becomes inspissated, resembling a whitish membrane.

* This substance it seems was noticed by Bartram the younger (see the Preface to his Travels). I was entirely ignorant of his conjectures respecting it, until long after I had proved their correctness.

MISSOURI BOTANICAL GARDEN.
The falling of the insect as soon as it enters the tube is wholly attributable to the downward or inverted position of the hairs of the internal surface of the leaf. At the bottom of a tube, split open, the hairs are plainly discernible pointing downwards; and as the eye ranges upwards they become gradually shorter and attenuated, till at, or just below, the surface covered with the bait, they are no longer perceptible to the naked eye, nor to the most delicate touch. It is here that the fly cannot take a hold sufficiently strong to support itself, but falls. The inability of insects to crawl up against the points of the hairs I have often tested in the most satisfactory manner. Spiders descend into the tubes, to prey (I suppose) on the entrapped insects, and ascend with impunity; but this is performed, as I have witnessed, by the assistance of their threads. Also a small species of Phalæna* appears to take shelter in these tubes during the day, and is enabled to ascend; but by what contrivance I am at a loss to conjecture, unless it be by some peculiarity of structure in its feet.

In the putrid masses of insects thus collected, are always to be seen one or more maggots in a very active state. To account for their presence, and to ascertain the insect to which they belonged, I was long unable. The mystery was however unveiled in the following manner: While watching attentively some tall tubes of the S. flava growing in their natural situations, in order to discover whether other insects as well as flies were attracted by the bait above described, a large fly caught my attention: it passed rapidly from one tube to another, delaying scarcely a moment at the faux of each, until it found, as it should seem, one

* This Phalæna, which is about half an inch in length, may be described by saying it is divided transversely into three equal parts; the first division including the head is black; the second dirty white, or yellow; the third is like the first: Larva a greenish geometra.
Sarracenia adunca to entrap Insects.

suitable to its purpose; then hanging its posterior extremity over the margin, it ejected on the internal surface of the tube a larva with a black head, which immediately proceeded downwards by a brisk vermicular motion. This viviparous musca was more than double the size of the common house-fly, had a reddish head, and the body hairy, and streaked grayish. I had often noticed it before among the S. adunca; but could never ascertain its object; the hoods probably obstructing my view.

That insects may be found in these tubes which were not allured by the bait, I have well ascertained. At the time that I discovered the origin of the larvae, I observed a beetle (Scarabeus carnifex, a herd being near) in its flight strike against the erect appendage of the S. flava and fall into the tube. In the leaves of the S. adunca, growing on the margin of a large pool, I once observed the fragments of a large Gryllus and several Gyrini. These and similar appearances have led me to suspect that our large Nepa*, an extremely voracious insect, may occasionally use these tubes as storehouses. The hooked feet of this last insect would doubtless enable it to ascend against the inverted pubescence.

What purposes beneficial to the growth of these plants may be effected by the putrid masses of insects, I have never ascertained; but I learn from a hint given in the article Dionaea, in Ree's Cyclopedìa, that it has been discovered that the air evolved is wholesome to the plants. I once entertained a suspicion that this air might be of such a deleterious nature as to cause the precipitation of the insects exposed to it, but I have long since relinquished it as entirely groundless.

* Very nearly allied to Nepa grandis of South America. It is very strong, and often destroys the Spring Frog. It inserts the claws of the two fore-feet into one of the frog's hind legs, and with the claws of its hind feet it grapples rice-stubble, or some aquatic plant; the frog unable to disengage itself becomes exhausted by struggling.
coquillages marins alternativement submergés et exposés à la chaleur du soleil, mais bien celle de ce liquide saturé de soude et de chaux muriatées et sujets à une évaporation que la température du climat nécessite.

De l'évaporation des liquides qui tiennent des solides en solution, résulte naturellement la précipitation de ces derniers. Mais comme il importe fort peu de considérer ici le corps précipité quant à la forme qu'il peut affecter en pareil cas, nous nous bornerons à observer, que les débris agglutinés des coquillages marins, infiltrés par l'eau de la mer, que la chaleur du soleil évapore sans cesse, reçoivent entre leurs interstices la chaux et la soude muriatées que ce liquide dissolvait, que la précipitation et une certaine adhérence de ces sels, envers ces débris agglutinés des coquilles, ont du déterminer une réunion plus parfaite de ces derniers, en devenant eux-mêmes parties constituant des de la masse pierreuse qui en est résultée par la suite. Examinons maintenant ce produit de la nature à l'endroit de son gisement et de sa formation.

La configuration et le rapport des masses sont certainement les premiers caractères qui doivent être spécifiés; mais ici nulle forme régulière ou constante ne se laisse appercevoir; nul rapport de position ou de nature ne parait exister entre le minéral dont il est question et les autres minéraux dont il est environné. Les débris agglutinés des coquilles auxquels ce premier doit sa formation figurent ordinairement à leur surface les ondulations de la mer, résultat de l'influence des marées ascendantes sur ces mêmes débris d'abord réunis par une faible adhérence. L'espèce de pierre qui provient de leur réunion est bien évidemment de formation nouvelle, et nous pouvons même dire journalière, ainsi que l'on peut s'en convaincre aisément sur le lieu.

Il n'est pas difficile de reconnaître ni même de distinguer à la vue
vue simple les premiers matériaux dont cette pierre est composée; il est évident, au contraire, qu’elle doit sa formation aux débris des coquillages marins qui se sont réunis, ainsi que nous l’avons déjà dit, par l’intermédiaire de la chaux et de la soude muriatées déposées entre leurs interstices.

Une adhérence très-faible et presque nulle caractérise le premier état d’agrégation des débris des coquillages marins, et nous oblige à ne considérer leur réunion que comme un état d’agglutination, en la définissant de la manière suivante :

1. Agrégat par agglutination, à gros grains, très-poreux et très-friable.

Une agglutination plus intime, ou une adhérence, toutefois indirecte*, réunit les débris des coquillages marins un une masse beaucoup moins fragile, qui peut être spécifiée par la dénomination de

2. Agrégat par adhérence à gros grains, poreux et non friable; composé de chaux muriatée, de soude muriatée, et des débris des coquillages marins.

Le troisième état de réunion de ces mêmes débris se distinguera par la définition de

3. Agrégat adhérent, compacte, ou à grains resserrés de même nature que le précédent.

Une adhérence plus parfaite de ces débris des coquilles, dans laquelle les parties hétérogènes réunies se trouvent confondues en un tout ou une masse à peu près homogène, peut admettre la co-

* Nous disons indirecte parce qu’il est démontré que les débris des coquillages marins ne sont point réunis par une adhérence réciproque, mais bien par l’adhérence intermédiaire de la soude et de la chaux muriatées pour ces mêmes débris.
hérénce pour définition. Ainsi nous déterminerons ce quatrième état par les caractères de

4. Agrégat cohérent, de même nature que le dernier, d'un gris jaunâtre, d'une saveur légèrement salée; semi-transparent sur les bords seulement; rayé par le verre, et rayant la chaux fluatée; répandant une odeur animale par le frottement; inphosphorescent; fortement sonore; réductible en chaux vive; soluble en entier et avec une forte effervescence dans l'acide nitrique dilué.

C'est sous ce quatrième état que les débris des coquillages marins réunis peuvent admettre la dénomination de pierre, et se ranger parmi les autres minéraux sous le nom d'agrébat composé de chaux carbonatée unie à la chaux et à la soude muriatées. Mais, outre que cette espèce de pierre se distingue, en admettant dans sa formation ces deux derniers sels, des concrétions calcaires carbonatées, que nous fournissent les lithophites et quelquefois les zoophites, elle se caractérise encore par un degré de dureté, que nous venons de déterminer par sa propriété de rayer la chaux fluatée, et par une pesanteur spécifique beaucoup plus grande que celle de la chaux carbonatée ordinaire.

Il ne sera, sans doute, pas hors de propos de donner maintenant une courte énumération des différents vers testacés, dont nous avons pu reconnaître les dépouilles, puisque de cette manière nous indiquerons les coquillages marins, dont les débris d'abord agglutinés, bientôt adhérents et enfin cohérents, ont produit l'espèce de pierre dont nous venons de retracer tous les caractères; ceci nous mènera encore à connaître les diverses incrustations que l'on peut rencontrer dans cette pierre par de plus amples recherches; mais il conviendra aussi de faire observer que cette énumération locale ne peut donner qu'une idée très-borrée de la Conchylologie des Antilles.
Le genre *Cypræa* de Linné se fait connaître par les espèces suivantes:

- *Cypræa Pediculus.*
- *Cypræa stercoraria.*
- *Cypræa Exanthema et Zebra.*

Ces deux dernières espèces ne sont suivant Bruguieres que la même coquille plus ou moins avancée en âge.

Parmi les *Buccinum* l'on trouve

- *Buccinum cornutum.*
- *Buccinum Perdix.*
- *Buccinum Dolium.*

Dans les autres genres l'on rencontre la *Voluta Oliva*; le *Mur- rex ramosus*; la *Bulla Ampulla*; la *Bulla gibbosa*; la *Nerita versicolor*; la *Nerita peloronta*; le *Strombus Lambis*; le *Turbo Pica*; le *Trochus niloticus*, et plusieurs espèces de *Patella*.

Toutes ces coquilles, ainsi que tous les corps qui se trouvaient interposés parmi leurs débris concassés, ont du nécessairement s'y incruster, du moment que ces débris se sont agglutinés. C'est pourquoi l'on y rencontre aujourd'hui, outre ces différents coquillages marins, quelques coquilles terrestres, des morceaux de poterie ou de terre cuite, des haches en pierre, instruments dont se servaient les naturels du pays; des ossemens humains isolés, et même des squelettes entiers plus ou moins bien conservés.

Non seulement la nature de tous ces objets n'est point altérée, mais de plus les coquilles se trouvent incrustées sans avoir perdu leur nacre et leurs couleurs. C'est donc à tort que l'on a vulgairement confondu jusqu'à ce jour l'incrustation de ces substances avec celles que l'on désigne communément sous le nom de pétrifications.
L'ORIGINE DES SQUELETTES.

Les apparences nous portent à présumer d'abord, que les squelettes que l'on trouve au bord de la mer à l'est du bourg du Moule, sont les charpentes d'autant de cadavres déposés dans ce lieu. Nos premières observations nous autorisaient d'autant plus à adhérer à cette opinion, que le squelette* que nous cherchons à extraire aujourd'hui se trouve dans une position qui paraitrait confirmer ce que nous avons avancé à ce sujet.

Les anciens du quartier prétendent néanmoins que cette opinion est mal fondée ; ils nous assurent, que cet endroit, où l'on a découvert successivement différents squelettes, était autrefois un carbet ; que ce carbet fut également habité par des Indiens de deux nations différentes, dont les uns connus sous le nom de Caraïbes étaient des hommes petits ou de moyenne grandeur, peu robustes, ayant les cheveux noirs assez longs ; et le teint d'un brun assez foncé. Les Galibis, au contraire, qui formaient l'autre nation de ces Indiens, étaient d'une stature extraordinaire de six pieds au moins, très-forte ; ils avaient également les cheveux noirs et très longs, mais le teint de ces derniers était d'un jaune olivâtre, même un peu basané.

La plupart des habitans du quartier du Moule s'accordent à admettre la co-existence de deux nations d'Indiens, même jusqu'à une époque bien postérieure à la découverte des colonies : quelques uns d'entre eux ajoutent : que les Galibis habitaient une partie du quartier du Moule, le quartier du Port-Louis, et l'Anse Bertrand, tandis que les Caraïbes occupaient le quartier de St. Anne, celui de St. François, et une partie de celui du Moule, où la

* For an account of this skeleton, see Philosophical Transactions for the year 1814, p. 107.
rivièrè servait de ligne de démarcation convenue entre ces deux peuples.

Quoique ces différents rapports ne soient point denuéd de vraiesemblance ou de probabilité, ils ne font toutefois point mention de l'époque à laquelle il faut remonter, pour retrouver ces deux classes différentes d'Indiens, ni du temps présumable de leur dispersion, émigration, ou déstruction.

Un particulier, homme digne de foi, nous assure cependant, que la destruction de ce carbet et la dispersion des Indiens qui l'habitaient ne remontent point à une époque très-reculée. Il nous dit : que son père, qui mourut à un âge très-avancé, lui a raconté maintenfois, non seulement, qu'il avait eu connaissance du carbet, que l'on dit avoir existé dans ce lieu, et des deux sectes d'Indiens qui l'habitaient, mais qu'il se rappelait de plus, que vers les années 1710 et 1711, une rixe s'était élevée entre les habitants de ce carbet, et que les deux nations entières intervinrent dans cette querelle. Un combat eut lieu dans ce-même endroit, ajouta le vieillard, et un grand massacre s'ensuivit. Les Galibis furent battus et dispersés, tandis que les Caraïbes vainqueurs restèrent maîtres du champ de bataille. Il se fit sans doute alors une émigration des Galibis qui survécurent à cette triste défaite, car il ne fut plus mention d'eux depuis cette époque.

Ce même vieillard raconta encore à son fils, qu'il s'était rendu sur le lieu quelque temps après cet événement, et qu'il vit quinze à vingt cadavres étendus sur le carreau. Les squelettes de ces cadavres furent encore reconnus il y a quarante ans environ par le particulier qui nous a fourni ces renseignements, ainsi que par plusieurs habitants du Moule. A cette époque, ces squelettes commençaient à s'incruster dans les débris agglutinés des coquilles dont toute la côte est meublée. Ce particulier observe toutefois que
On the Origin of

que l'on pouvait alors en détacher ces squelettes au moyen d'un simple morceau de bois.

La position dans laquelle l'on a trouvé de nos jours, dans cet endroit, des squelettes incrustés dans la pierre, paraîtrait devoir nous éclairer, quant à la vérité des faits que nous venons d'exposer. Il n'y a que quelques années, qu'un squelette fut déterré et enlevé avec une pierre d'incrustation, de formation nouvelle (ainsi que l'on pouvait en juger par l'extrême friabilité de cette pierre). Ce squelette* fut trouvé dans la position d'un homme assis à terre et dont les talons rapprochés du rectum ramenaient les genoux à une très grande proximité de la tête ; les bras un peu repliés sur eux mêmes étaient appuyés sur les genoux. Ce genre de sépulture a été, dit-on, celui adopté de tout temps par les Caraïbes ; nous ne pouvons donc rien inférer de l'exposition de ce fait. Le squelette dont nous surveillons aujourd'hui l'extraction est étendu sur le dos dans toute sa longueur, et paraît un peu incliné sur le côté gauche. Il serait encore difficile ici de pouvoir déduire une conséquence dont nous puissions être satisfaits, et de prouver que le cadavre auquel ce squelette a appartenu n'ait point été enterré de cette manière. Tout ce que l'on peut conclure de la différente position des deux squelettes dont il vient d'être parlé, c'est qu'en admettant, qu'ils aient reçu l'un et l'autre la sépulture, ils paraissent avoir appartenu à des individus de nation différente, ou chez qui les usages différaient à l'égard de l'inhumation.

Il convient donc encore de nous en rapporter ici à la tradition ; des témoins oculaires s'accordent à attester, que les différents squelettes qui se trouvaient au bord de la mer, à l'endroit du

carbet, étaient dispersés; que des membres étaient épars, et que la position de ces squelettes n'était nullement analogue à celle que l'on pourrait supposer à des cadavres enterrés, d'autant plus qu'elle n'était point la même partout. Des ossements isolés se trouvent encore aujourd'hui sur le même lieu; des arcs, des flèches, des haches ont également été trouvés à différentes époques par les habitants du quartier.

Au Moule, ce 15 Avril 1806.
X. Descriptions of a new Genus of Plants named Araujia, and of a new Species of Passiflora. By Felix de Avellar Brotero, Professor of Botany in the University of Coimbra, F.M.L.S.

Read November 7, 1815.

ARAÚJIA.

CHARACTER GENERICUS.


ARAÚJIA SERICOFERA.

A. caule fruticoso, scandente; foliis cordatis, integerrimis, glabris, ad petioli apicem glandulosis; racemis paucifloris. Radix perennis, ramosa, serpens. Caulis fruticosus, debilis, scandens, teres, glaber, infernè pennæ anserinæ supernè gallinaceæ crassitudine, tres quatuorve pedes et
et ultra longus, succo lacteo refertus, (uti flores, fructus, et tota planta,) ramosus, ramis glabris, junioribus subtomentosis, oppositis, patentibus, interdum uno ex ipsis in oppositione abortitente, aut seriös pullulante, nec paucis ad idem latus sursùm reversis.

*Folia* opposita, oblongo-cordata, acuta, patentia, (nonnulla interdum secunda,) venosa, integerrima, suprà saturate viridia, glabra, basi prope petioli acum duabus tribusve glandulis minimis instructa, subtus dilutė viridia, seu subglauca, glabra, sed lente visa subtomentosa, tres quatuorve uncias longa, novem ad quatuordecim lineas in basi lata: petiolus subteres, suprà canaliculatus, glaber, aut lente visus subtomentosus, triplō quadruplōve folii laminā brevior.

*Flores* racemosi; racemi penduli, simplices, pauciflioni, quorum flores plures sœpè abortivi; inferiores floribus quinque ad septem alii versus caulis ramorumque apicem numero florum sensim decrescentes. *Pedunculus* communis extus è latere axillae foliorum exortus, teres, glaber, patens aut cernuus, semi-unciam plus minusve longus, partialibus brevior: *Pedicellus* infimi floris unius majori bractēae oppositus unciam aut paulo ultra longus, uti quoque pedicellus terminalis; alii breviores, ex bracteare florum oppositarum axillis exorti, et non rarō infra medium duabus aliis bracteis minoribus oppositis instructi. *Bractēae* omnes sessiles, lanceolatæ, integerrimæ, utrinque glabræ, virides, patulæ.

*Cal.* Perianthium monophyllum, magnum, ita profundè quinquepartitum, ut ferè pentaphyllum videatur, persistens; laciniiis lato-lanceolatis, acutis, integerrimis, utrinque glabris et dilutē viridibus aut interdum extus sordidē subpurpureis, primum erecto-patulis, dein patentibus, altitudine inter seœqualibus, rariüs
M. BROTERO'S Descriptions of a new Genus named Araujia,

rariùs latitudine subæqualibus, corollâ brevioribus, quinque ad septicem lineas longis, tres ad quinque in medio latis.

Corolla monopetala, campanulata; infernè subglobosa, obtusa, pentagona seu quinquegibba, gibbis ex viridi flavis, singulæ limbi laciniae oppositis; tubo infra medium ad organa sexualia coarctato, exinde laxiusculo, extùs usque ad limbi lacinias sor-didè purpureo; quinquefida, lacinis tubo brevioribus, ovatis, obtusiusculis, leviter revolutis obliquatisque; intùs, ex apice usque ad tubi coarctationem, venis striisque variis saturatè purpureis pulchrè picta, exinde zonâ albà, villosâ, ad lineas duas latâ, cincta; fundus ventricosus, sacculis quinque gla-bris albisque instructus, suprà tenui membranà marginatus, centro in tubulum crassum, conicum, decurrentibus staminum filamentis coadunatum, germina arctè involventem, et stigmate clausum, sursùm producto. Ejus ima basis perforata, quà receptaculo adhæret, sesquilineae duarumve linearum diâmetro, vix constat; ex ipsâ usque ad limbi lacinias decem undecimve lineas longa est, et diâmetro linearum ferè quinque inter fundi gibbas gaudet. Post anthesin facilè decidit.

Nectaria, non squamulae neque auriculae, sed sacculi, qui, stami-num inter filamenta curva decurrentia, gibbas extrorsùm effi-ciunt, et sub laxis antherarum commissuras ex opposito siti sunt; in istis enim sacculis succus melleus, ex praedictis com-missuris exsudatus, continetur.

Stam. filamenta quinque, alba, crassa, plana, deorsùm sensîm latiora, per corollæ fundum arcuatè decurrentia, ex ipso de-mùm exerta auriculis ad antheras conniventibus terminantur; supernè rimis vix apparentibus inter sese distincta, infernè in fundo corollæ inter sacculos quinque distantia; intùs tubulo centrali conico ipsius fundi adnata; paulò sub antheris, squamà horizontali
and of a new Species of Passiflora. 65

Horizontali alba, brevi, latâ, leviter emarginatâ, obovatâ, sessili, instructa; hâ omnium filamentorum squamæ quinque corollæ et stigmæ oppositæ, ipsis approximatae, albae, carnæ, glabrae, obtusa, hinc concavae, absque ulla corniculis, inde convexæ; harum tres minores, ovatae, extrorsum ad corollam concavae, duas alia latiores, ovato-cardatae, introrsum ad antheras concavae, et ad unius ex minoribus latera utrinque sitæ. Corollæ tubus, has supra auriculas quinque convergentes, coarctatur.

Antheræ quinque, cum corollæ lacinii alternantes, filamentis adnatae, sagittatae, germinum apicibus approximatae, membranâ ovato-cardata, inflexâ, et stigmati arctè tenui, terminatae; utrinque alâ reversâ deorsum sensim latiore prominentioreque, demum in denticulum rigidum fragiliumque desinente, auctæ; vicinis aliarum antherarum alis similibus contiguae, inferne versus intus laxæ; biloculares, loculis pollinigeris apice introrsum, sub membranâ terminali, dehiscentibus.

Pro polline, in utroque singulæ antheræ loculo, corpusculum compactum, ex viridi flavescentis, planiusculum, spatulatum, intus (lente visum) contextu cellulari granuloso succulentum farctum, extus cuticulâ sebrâ tectum, supernè lateraliter filo insertum; filum breve, elasticum, obliquum, apice basique ad insertiones nodosum, hyalinum, succis ex viridi flavescentibus conspurcatum, supernè ad tuberculi nigri latus prope basin adhaerens: tuberculum nigrum ovale, extus nitidum, intus opacum, cartilagineum, medio sulcatum et quasi didymum, apice duabus squamulis ovalibus minimis, albis, hyalinis, stigmati adhaerentibus, terminatum, antherarum alis, corollæque laciniiis oppositum, uni ex quinque stigmatis foveolis ovalibus

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semi-immersum; ex alio ejus baseos latere aliud simile filum emittit, quod obliquè descendens corpusculo spatulato primi loculi proximæ antheræ similiter adhæret: unde singulum tuberculum duarum antherarum corpusculis spatulatis commune, et singula anthera filis hinc inde duorum tuberculorum corpuscula spatulata ministrat.

*Pist.* Germina duo approximata, ovata, acuminata, glabra, in tubulo seu cavitate conicâ centrali fundi corollæ cum stylis recondita. Styli duo graciles, teretes, brevissimi, mucroniformiter persistentes. Stigma utrisque commune, magnum, crassum, ovato-subglobosum, glabrum, apice leviter emarginatum, bicone, coniculis incurvis, introrsum canaliculatis; obsoletè quinquestriatum, inter strias foveolis quinque ovalibus, pro tuberculis quinque nigrum recipiendis, succo ex viridi flavescente tinctis, excavatum; apicibus antherarum membranaceis ferè usque ad medium tectum; sub foveolis in ora baseos marginali seminaturis quinque leviter notatum.

*Per.* Folliculi duo (quorum unus non raro abortit) oppositi, plus minusve reflexi, oblongo-subovales, magni, tres ad quatuor uncias longi, unciam ad sesquuncia et ultra in medio lati, coriaceo-fungosi, corio ad sesquilineam crasso, apice obtuso leviter mucronati, basi cavâ retusi, subrugosi, glabri, dilutè virides; intûs ex viridi albidi, à seminibus prementibus subalveolati, univalves, semibiloculares, extûs, quà parte in florescentiâ contigui, longitudinaliter unisulcati, sulcoque conscissè dehiscentes.

*Dissepimentum,* seu seminum receptaculum, longitudinaline hinc liberum et usque ad folliculi centrum aut paulò ultra proternsum, inde ad ejus parietem sub sulco tenuiter adhærens, in matura verò dehiscentiâ omnìn solutum, solumque ipsius basi ct apici adhærens, latum, subcoriaceum, propo latus externum sub
sub sulco, inque basi et apice, nudum, cæterùm utrinque multiplicant alatum, alis, seu lamellis, membranaccis, ad quadranginta, latis, semilanceolatis, acutè deorsùm serratis, dentibus prope folliculi basin acutioribus, longioribus. 

Semina numerosa, ad quingenta (nonnulla abortientia) deorsùm imbricata, immatura, internè prope comæ ortum, dissepimenti lamellarum dentibus adherentia, in maturitate soluta, crassiuscula, compressa, ovato-oblonga, versus apicem attenuata, tuberculis obtusis mollibus instructa, hinc convexa inde subplana ibique in medio obsoletà costà notata, è castanco fuscâ duas lineas cum dimidia longa, apice truncata, comosa. Coma pilosa; pilis numerosis, simplicissimis, albis, tenuissimis, sericiformibus, altitudine inæqualibus, in seminibus insimis ad duas uncias et ultra longis, in aliis sensim ad apicem folliculi brevioribus; in fructu immaturo omnibus inter sese adherentibus, fasciculumque magnum, crassum, fibriforme constituentibus, in ipso autem maturo inter dissepimenti lamellas arctè contentis, demum divergenter solutis.


Habitat in Perù, unde sub nomine Apocyni Peruviani misum. In Regio Horto Olisiponensi autumno floret, fructus autem vere maturescit; ibi tota planta pluribus abhinc annis frigus hibernum fert, et cicarata demum est: inodora, sed acris, cum succis lacteis abundè plena sit, et ut videtur virosa.

Quod ad organa sexualia Generis attinet, existimo corpusculum compactum, succulentum, ex viridi flavescens, quod singulum antherarum loculum occupat, verum sperma fœcundans continere, affine illi, quod in granulis antherarum Orchidearum seccernitur, sed diversè perfectum stigmatique diversè applicatum; in Orchideis enim, liquore spermatico in granulis antherarum compactis completè præparato, exinde eorumdem granulorum fila, halitu quodam venereo, ex stigmatis mucositate emisso, irritata convergunt, ad istud immediatè applicantur, ipsumque liquore spermatico sensim ex sudato irrorant: in nostro autem Genere liquor spermaticus in corpusculis antherarum compactis non completè perficitur, sed quadam elaboratione in filis et tuberculo nigro perfiendi indiget; quaprop-ter, apertis antherarum loculis, liquor spermaticus imperfectus illico à vicinis filis proximè adhærentibus absorbetur, exinde per ipsorum vasa sensim adscendens ad tubercula nigra pervenit, ibique demùm perfectè elaboratus ad stigmatis foveolas, per sulcum seu rimam internam singuli tuberculi, sensim egre-ditur seu exsudat; unde per vasa spermatica stylorum et receptaculi ad ovulæ fœcundanda descendit. Hæc omnia ita se habere,
habere, succi ex viridi flavescentes, quibus fila internè conspurcari videntur, nec non et stigmatis foveolae quinque eisdem succis tinctae suadent. Squamulas tām antheris quàm tuberculis nigris natura dedit, ne liquor spermaticus humiditate aliquā externā misceretur, aut ipsi ne aēris nimia aliqua siccitas noceret.

EXP LICATIO.

TAB. IV.

Fig. 1. Caulis pars extrema et unus ramus lateralis florentes.
(aa.) Folia paginā superiori visa.
(bbb.) Folia nonnulla ad idem latus versa, et paginā inferiori visa.
(ccc.) Racemi.

EXP LICATIO.

TAB. V.

Fig. 1. Flos apertus magnitudine naturali visus.
2. Ejusdem calyx cum pistilli germinibus duobus visus.
3. Corolla calyce separata cum gibbis in basi.
4. Corolla verticaliter scissa et expansa, ut ipsius interna facies insimul cum auriculis quinque, quibus staminum cauda plana terminatur, conspicienda veniat.
6. Eadem partes imā corollā sacculisque nectariferis nudae; sed auriculae patentissimè positae, ut meliūs conspiciantur.
Fig. 7. Auriculae duae ita dissecctae, ut appareat modus quo in antheras et pistillum connivent.
8. Unius staminis anthera cum suo filamento crasso, plano, in auriculam desinente (hic non arcuatim, sed recte depicto).
11. Eaedem partes magnitudine naturali, et sine receptaculo, scilicet, germina duo, styli et stigma bicerne cum foveolis pro tuberculis nigris recipiendis.
12. Tubercula duo, singulum cum duobus corpusculis polliniferis, stigmatis foveolis applicata (lateraliter visa).
13. Tubercula omnia quinque, singulum cum suis duobus corpusculis polliniferis, stigmati applicata.
14. Tuberculum unum nigrum cum suis duobus corpusculis polliniferis, singulis et filo pendentibus (omnia magnitudine naturali).
15. Eaedem partes lente auctae.
16. Folliculi duo magnitudine naturali paulo minores.
17. Unus ex folliculis verticaliter sectus, ut semina et disseptimentum conspiciantur.
18. Dissepimentum cum suis lamellis serratis separatum.
22. Idem transversè sectum.
and of a new Species of Passiflora.

PASSIFLORA RACEMOSA.

*Martyrio cachudo* (Lus. Bras.)

*P. foliis subpeltatis, basi emarginatis, glabris, trilobis; lobis ovatis, acutiusculis, integerrimis, intermedio productioni; petiolis quadriglandulosi; floribus terminalibus, racemosis; calycis laciniis acinaciformibus, corollâ longioribus, apice introrsùm bicornibus.*

**Tab. VI.**

*Rudix* perennis, caule crassior, obconica, inque ramos obconicos infernè multifibratos, divisa. Inodora est, atque nullo alio sapore, nisi herbaceo, prædicta, sicque totius plantæ partes aliae sunt.

*Caulis* sarmentosus, teres, glaber, ut tota planta, infernè prope radicem crassitudine digiti, lignosus, subrimosus, nec tamen su-berosus, supernè filiformis, crassitudine fili sutorii aut tenuior, altè arbores scandens, ramosus. Rami etiam filiformes, alterni, scandentes, superiores racemis terminati, penduli.

*Folia* alterna, duas ad quatuor uncias inter sese distantia, paten-tia, coriacea, utrinque glabra, saturatè viridia, impunctata, basi emarginata, subpeltata, omnia triloba (caulis infinis exceptis, quæ sæpe ovata) lobis ovatis, acutiusculis, integerrimis, medio latiori longiorique, lateralibus binervis, sinibus obtusis, à basi ad lobi medii apicem tres ad quatuor uncias longa, transversè, inter lóbus laterales, tres ad quatuor uncias cum dimidia lata.

*Petiolus* foliâ laminâ ferè dimidio brevior, sesquiunciam ad duas uncias aut paulò ultrà longus; subteres, basi articulatus, glandulis sæpiùs quatuor, sessilibus, ovatis, apice leviter concavis, instructus, quarum due infra ipsius medium suboppositæ, et due
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duae aliæ paulò infra folii laminæ basin obliquæ inter sese distantes, sìtæ sunt.

Ad basin et latus petioli stipulæ duæ solutæ, oppositæ, sessiles aut subessiles, cauli appressæ, utrinque glabrae, integerrimæ, acutiusculæ, mucronatæ, ovatæ aut subcordato-ovatæ, basi obliquatæ, inæquilateræ, semilaminâ internâ dimidio angustiore, semiunciam ad fere unciam longæ, caducae.

Inter stipulas, et in axillâ petioli, cirrhus filiformis, simplex, viridis, primùm rectè tensus, folio longior, demùm spiraliter tortus, folio æqualis aut brevior.


*Pedunculi* partiales simplicissimi, sæpe novem ad tredecim, infimus et supremi sepius solitarii, alii alternè bini, unciam aut paulò ultrà longi, teretes, ex patenti adscendentes (in fructûs verò maturitate penduli) paulò infra calycem articulati, ibique demùm à casu involucri trituberculati; basi inter binos, et sub solitariis, cirrhus brevis spiraliter tortus, ibidemque ad eorum latera stipulæ duæ oppositæ, adpressæ, versus apicem rachis sensim minores, citò caducae, ex omni parte illis, quae ad petiolorum basin sitæ sunt, persimiles.

*Floris* involucrum ad duas lineas, duasve cum dimidia, infra calycem
and of a new Species of Passiflora.

calycem situm, triphyllum, foliolis ovatis, leviter inaequilateris, mucronatis, integerrimis, subsessilibus, glabris, erectis, primùm flori recenter è gemmâ evoluto subæqualibus, demùm calycis tubo paulò brevioribus, omnibus, sæpè multò ante floris apertìonem, caducis.

Cal. perianthium inferum, glabrum, monophyllum, infernè tubulosum, limbo profundè quinquepartito; laciniis petalis corollæ nonconformibus, extùs sordidè puniceis, latissimè carinatis, carinâ acinaciformi, intùs ferè usque ad apicem concavis, coccineis, apice introrsùm semilunato-bicornibus (corniculo superiori longiori uncinatoque) patentissimis, duas uncias cum di-midiâ longis, tres lineas et ultra in medio latis, simul cum corollâ narcescentibus; tubo cylindraceo, obscure subpuniceo, obsoletè decemlineato, duas ad tres lineas longo, infernè duas lineas aut paulò ultra lato. Dum inapertum, tumidè obconi-cum, argutissimè quinquangulum, profundè quinquessinuatùm.

Corolle petala quinque, fauci calycis inserta, ipsiusque laciniiis ½ ferè breviora, patentia, semilanceolata, obtusiuscula, integerrima, planiuscula, extùs levitèr carinata, intùs subcanaliculata, in solo natali utrinque coccinea.

Nectarium corona triplex, filamentosa, filis omnibus supernè albis, infernè cæruleis; intima exteriori altitudine æqualis, filis circa stipitem cylindraceum conniventibus, inter sese æqualibus, simplicibus, infernè membranâ coalitis, margini receptaculi elevato, fundum calycis circumcingenti, adnatis; duæ aliae fauci calycis sub petalis insertæ, intermedia brevier, filis vix extra calycis faucem exertis, erectis, apice subcapitatis, inter sese æqualibus; exterior filis simplicibus, duas tresve lineas extra calycis faucem prolongatis, patentibus, inæqualibus, illis, quæ calycis laciniis sunt opposita, longioribus.

Stam. filamenta quinque, summo stipiti sub germine inserta, basi
levitér coalita, pallidè viridia, sublinearia, erecto-patula. An-
theræ sublineares, obtuse cum brevi acumine, incumbentes, 
ex viridi lutescentes, medio et lateribus unisulcatae, bilocu-
lares. 

**Pist.** Germen superum, oblongum, subovale, obsoletè trisulca-
tum, glabrum, pallidè viride, apici stipitis insidens, qui ad 
um uniam extra calycis faucem pretenditur, cylindraceus, 
viridis, basi pentagonà latior. Styli tres, supernè crassiores, 
pallidè virides, ad antheras recurvi. Stigmata capitata, ex lu-
tescenti viridia. 

**Peric.** Bacca pedicellata, ovalis, trisulcata, glabra, pallidè viridis, 
ad duas uncias longa, unilocularis, polysperma, carnosa, demùm 
exsucca. 

**Semina** axillata, ovata, compressa, receptaculo triplici, quod cort-
tici baccae longitudinaliter adnatum est, adhærentia. 

**Habitat** in umbrosis sylvaticis inque solo glareoso littorali unam 
fere leucam ab urbe Riojanerià dissitis, et alibi in Brasilià. 
Floret Novembri, Decembri. Frutex sarmentosus, ob pul-
cherrimos flores sat dignum hortorum ornamentum. 

Hanc novam speciem clariss. E. I. A. Woodford, botanices dili-
gentissimus, in Brasilià invenit, in Europam secum transvexit, 
et mecum, uti alias quoque stirpes rariores in horto suo Olisi-
ponensi cultas, benevolè communicavit. Quantùm ab omni-
bus aliis hucusque cognitis congeneribus differat, ex florescen-
tià racemosà, calycis formà, et aliis notis in descriptione posi-
tis, abundè patet. 

**Obs.** In solo natali caules duos ex eâdem radice sepè fert, quo-
rum unus altè scandens, et omninò defoliatus fructificat; alter 
foliatus, scandens aut procumbens, tardius, hoc est, uno alióve 
anno transacto postquàm primus fructus tuit, florifer. Variat 
in Europà 1o. Aliquorum foliorum petiolis triglandulosis aut 
quinque-
and of a new Species of Passiflora.

quinqueglandulosis, nec quadriglandulosis; 2°. Calyce et corollæ plus minusve puniceis, nec coccineis; 3°. Nectarii filis albidis, inferne virescentibus, nec cæruleis.

EXPLICATIO.

Tab. VI.

Fig. 1. Unius rami nondum florentis pars extrema cum foliis, stipulis et cirrhis.
(a.) Folii petiolus cum glandulis quatuor.
(b.) Stipulæ.
(c.) Cirrhus.

Fig. 2. Alterius rami pars extrema nuda, racemosa.
(A.) Racemi ex arbore vicinâ penduli pedunculus communis.
(aaaaa.) Floris primarii aperti calycinæ laciniae, dorso acinaci-formes, apice bicornes.
(bbbbbb.) Corollæ petala.
(B.) Staminum antheræ, et filamenta stipiti summo inserta.
(C.) Stigmata et styli cum germine apici stipitis insidente.
(DD.) Nectarii corona triplex.
(EE.) Pedunculi partiales, alternè bini, cum cirrho inter ipsos spiraliter torto.
(c.) Pedunculi articulatio.
(d.) Calycis pars inferior tubulosa.
(e.) Calycis pars superior inaperti quinquangula.
(F.) Unus ex floribus extremis involuratus.
(G.) Racemi pars extrema cum stipulis, et nonnullis floribus involucro penitus tectis.

Fig. 3. Unius floris recentèr è gemmâ evoluti involucrum triphyllum: (a.) ejusdem foliolum separatum.

Fig. 4. Bacca matura.

Read Feb. 6 and 20, 1816.

The class Syngenesia of the Linnean artificial system, as at present limited, constitutes a family strictly natural, and by far the most extensive in the vegetable kingdom. It is also, with the exception of Grasses only, the most generally diffused, and is almost equally remarkable with that order, for the great apparent uniformity in the structure of its essential parts of fructification.

This class of plants, for which I retain the established name Compositae, in preference to any of those recently proposed, has lately become the subject of a minute and accurate examination by Mons. Henri Cassini; two of whose Memoirs on the Style and Stamina of the class, already published in the Journal de Physique*, are in my opinion models for botanical investigation.

A few years before the publication of M. Cassini's Memoirs on Compositae I was induced to examine a considerable part of this extensive family, chiefly with a view to the more accurate determination of the New Holland plants belonging to it.

My principal object in the present paper is to communicate such general observations, the results of this investigation, as either have not yet been published by M. Cassini, or respecting which I consider myself to have anticipated that author in my General Remarks

* Of 1813 and 1814.
on the Botany of New Holland, appended to Captain Flinders's Voyage to Terra Australis.

To these observations I shall add some remarks on certain genera of Compositae, which occur repeatedly under different names in late systematic works, and whose structure and limits appear to be imperfectly understood.

My first observation relates to the peculiar disposition of the nerves or vessels of the corolla of this family of plants.

In the essay already mentioned, which appeared early in the summer of 1814, I have noticed this peculiarity in the following terms:

"The whole of Compositae agree in two remarkable points of structure of 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, might be regarded as recurrent; originating from the united apices of the primary branches;"
branches; but 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."

At the date of this publication I certainly had no knowledge of any similar observations having been previously made: but I now see in M. Cuvier's account of the proceedings of the Institute of France for 1815, that M. Cassini is considered as having anticipated me on this subject, and as he says in "termes non équivoques." What these terms are, appears by a letter I have received from M. Cassini himself, in which he states his claim to rest on the following passage:

"Chaque fleur hermaphrodite ou male contient cinq étamines, correspondant aux cinq nervures de la Corolle et par conséquent alternes avec ses lobes."

This passage occurs in a Memoir on the Stamina of Compositæ, which was read to the Institute of France in July 1815, and first appeared with the substance of that Memoir in the Journal de Physique, said to be for April 1814; but the actual date of the publication of which I have reason to believe was somewhat later, and very nearly corresponding with that at which M. de Jussieu was in possession of a copy of my essay containing the observations already quoted. I conclude it is not supposed I could have been acquainted with the passage in the original memoir, unless the report usually made on memoirs read to the Institute should have been printed, and should have actually noticed this passage or the discovery it is now said to contain.

But independently of the near equality of dates, I cannot consider
sider my observations as either wholly or even in any considera-
ble degree anticipated by the passage in question. My observa-
tions notice not only the disposition of the five vessels in the tube 
of the corolla, but their ramification in the laciniae, by no means 
a necessary consequence of that disposition; they notice also the 
existence, in several genera of Composite, of five vessels alternate-
ing with those, and which I considered secondary in this order, 
though they occupy the place of the primary vessels in other fa-
milies: and it is this inverted disposition, indicated in the greater 
part of the class by the primary being the only vessels existing, 
which I have considered as of material importance in determin-
ing the limits of Composite, though by no means as affording an 
essential practical character for the whole class.

In the passage quoted from M. Cassini (the only one I can find 
relative to the subject in the memoir in which it occurs), the 
existence of five nerves or vessels in the tube of the corolla, 
alternating with its laciniae, is stated, but their division and dis-
position in the laciniae are not noticed; it is at the same time to be 
inferrred from the terms of the passage, that no other vessels exist 
in the tube of the corolla: and it is equally evident that, so far from 
announcing this disposition of vessels as a discovery, or peculiar 
to the order, the author rather considers it either as a fact already 
known, or as the usual structure. That M. Cassini was not then 
aware of the importance of the fact which he had imperfectly 
stated, appears likewise from his having, many months after his 
memoir was read, and at a time when he says he had finished his 
analysis of the corolla, proposed a name for the class, taken from 
a supposed peculiarity in the structure of the filament, a name 
which he is now inclined to abandon for one derived from the dis-
position of vessels in the corolla.

Since
Since my attention has been again turned to the subject, I have endeavoured to collect all that has been observed on the nerves or vessels of the corolla of Compositæ, a brief account of which may be not altogether without interest.

The earliest notice I have been able to find is contained in a passage (in page 170) of Grew's Anatomy of Plants, where, in speaking of syngenesious flosculi, he says, “they are frequently ridged, or as it were hem'd like the edge of a band.” And his figure of a magnified floret of the common Marigold, in tab. 61, gives a tolerable idea of the marginal vessels of its laciniae. Grew however takes no notice of the trunks from which these branches arise, either in his text or plates.

Van Berkhey, in his Dissertation on Compositæ, published at Leyden in 1760, though he makes no mention of the nerves of the corolla in his text, yet in all the magnified figures he has given both of ligulate and tubular florets, correctly represents the trunks of the primary vessels, without however noticing their ramification in the laciniae. I am anticipated therefore by this author's figures exactly in the same degree as by the passage contained in M. Cassini's second memoir.

The accurate Schmidel, in the few Compositæ which occur in his Icones, has correctly represented the trunks of the primary vessels, but has equally omitted their ramifications.

In the Analysis Florum of Batsch, a work published in 1790, the object of which was to give an idea of the structure of the natural families of plants, by a minute description and magnified figures of one or more species selected from each, Coreopsis tripteris occurs; and although the vessels of its tubular floret are very indistinctly figured, yet both their trunks and branches are correctly described. The same author however, who in 1802 published
lished an ingenious work on the natural families of plants*, takes no notice of the vessels of the corolla in the character of Composite which he has there proposed.

In the figures of syngenesious plants given by Schkuhr†, wherever the ligulæ of Cichoraceæ are magnified, the trunks of the nerves are correctly represented ending in the sinuses; unless in one plate containing Lactuca virosa and Sonchus sibericus, in both of which the vessels are made to pass through the axes of the teeth; but in no case are the marginal branches noticed. It is singular that this generally accurate author, in the many magnified figures he has given of tubular florets, has only in two cases represented the trunks of their vessels, namely in Echinops Ritro, where they are correctly placed, and in Silphium trifoliatum, where, though only five vessels are visible, they are erroneously made to pass through the axes of the laciniæ.

The only remaining author that notices these vessels is M. Mirbel, who in the second part of his valuable Elémens de Physiologie Végétale et de Botanique, published in 1815, introduces into his character of Composite the fact of the laciniæ of the corolla being furnished with marginal nerves. This observation, if not original, the author may have adopted either from my essay already quoted, of which he was in possession soon after its publication, or from M. Cassini's third memoir, which was read to the Institute of France six months after that essay appeared: but he could not have derived it from the passage in that author's second memoir, on which he rests his claim; no notice being there taken of the disposition of vessels in the laciniæ.

In M. Cassini's memoir expressly on the Corolla of Composite, which was read to the Institute of France in December 1814, and of which an abstract, by the author himself, is given in a late * Tabulae affinitatum regni vegetabilis. † In Botanisches Handbuch.
number of the Nouveau Bulletin des Sciences, the disposition of vessels in the corolla is expressed in the following terms:

"Chacun des cinq petales dont se compose la corolle est muni de deux nervures très simples qui le bordent d'un bout à l'autre des deux côtés, et confluent par conséquent au sommet."

On this statement I have several remarks to offer. And first, I object to its hypothetical language. Whatever opinion may be formed of the theory here adopted by the author, namely, that every monopetalous corolla is in reality composed of several confluent petals; a theory first proposed by Linneus himself in his Prolepsis Plantarum, and ably supported on different grounds by Mons. Decandolle in his excellent Théorie Elémentaire de la Botanique; I can see no advantage in adopting its language in stating a fact of this kind, especially if proposed as a practical character.

For my own part, I consider this opinion as correct in the sense in which it was held by Linneus, without, however, connecting with it the ingenious hypothesis of M. Decandolle, namely, that petals are only modified stamina. It remains to be seen on what ground M. Cassini has adopted this theory, as proposed by M. Decandolle, for Compositæ, the only family which seems to present a very important objection to it, in having its principal, and in the greater part of the order its only, vessels occupying the lines of junction of the supposed united petals.

To adapt this disposition of vessels to the theory, M. Cassini is obliged to subdivide their apparently simple trunks; a division, however, which may be regarded as entirely hypothetical. From the observations I have made on the subject, I have no doubt that these trunks are equally simple with the secondary nerves when present, or with the primary in other families. I find them to consist of two kinds of vessels, the spiral and ligneous. Of the spiral vessels
vessels there are generally several in the cord: in Helianthus multiflorus, however, I have not been able to find more than one, either in the trunk of the nerve above the insertion of stamina, or in the branches of the laciniae. It will be of some interest to verify this fact (which I by no means give with absolute confidence), both on account of the apparently formidable objection it presents to the theory in question, and also that, in following it up by an examination of the point of division, a clearer idea may be obtained of the ramification of spiral vessels than has hitherto been given.

My second objection to M. Cassini's account is, that he describes the nerves as marginal through their whole length. I have formerly, in the passage already quoted, stated them to be parallel and approximated to the margins of the laciniae. Perhaps in no instance can the branches be considered as strictly marginal; in many cases they are manifestly distinct from the margins, and in the genus Hymenopappus are further removed from them than from the axis of the laciniae. In H. scabiosus there is also an evident inequality of the two branches in each lacinia, the stronger extending nearly to the apex, while the weaker either entirely disappears before it reaches the stronger, or unites with it considerably below its termination. In H. tenuifolius this irregularity is still greater; one branch being not unfrequently altogether wanting, and even the remaining branch considerably weakened: where this happens a secondary vessel is always produced, though very few flosculi are furnished with five complete middle nerves.

To the fact stated by M. Cassini that the lateral nerves are always simple, I have met with only one apparent exception, in an unpublished species of Madia, where they are connected by a few branches with the secondary or middle nerve, which in this

plant
Mr. Brown's Observations on the plant is more strongly marked than the primary, and from which indeed these connecting branches probably originate.

It must, I think, be admitted by M. Cassini, that in many genera of Compositae five vessels passing through the axes of the segments exist, even ten others are occasionally found, as in Helianthus, though these can hardly be traced below the insertion of stamina. But as it has been already shown that the lateral or primary vessels are not strictly marginal through their whole length, and as one instance has been produced in which their branches, if not themselves subdivided, are at least connected by ramifications of the middle nerves*, it follows that a monopetalous corolla having in its tube fifteen nerves with distinct origins, three of which are continued through each of its segments, and unite together at the apex, would upon the whole better correspond with the definition M. Cassini has given of the corolla of Compositae, than the actual disposition of vessels in that order. Now such a structure exists in the whole of Goodenoviae†, a family of plants very nearly related to

* M. Cassini himself (in a note to his third memoir published in the Journal de Physique for February 1816, p. 129) has given another instance of the ramifications of nerves in Iva frutescens.

† I have formerly observed (in Prodr. Flor. Nov. Holl. p. 580, and in General Remarks on the Botany of Terra Australis) that Euthales and Velleia, genera belonging to Goodenoviae, exhibit the remarkable and nearly peculiar character of a corolla having the lower part of the tube cohering with the ovarium, while the calyx is entirely distinct. I have at the same time remarked that, even in those genera of the same natural family in which the calyx is coherent, the tube of the corolla may be supposed to be continued down to the base of the ovarium; and that this becomes even evident in such species as have the adhering part dilated into nectariferous processes; or in those where, the segments of the calyx not being closely approximated, the coloured corolla is visible in the interstices. In some species of Goodenia, particularly G. decurrens and bellidifolia, I find it practicable to separate not only the adhering calyx, but also the tube of the corolla from the ovarium. In the tube thus separated it appears that the lateral nerves, which preserve their parallelism to the middle nerve nearly to the base of the segment, become more evidently divergent below the point
to Compositae. It exists also in Ernodea, in which the lateral nerves, though they give out externally a few branches, observe the same course, and terminate in the same manner in the laciniae as those of Compositae. A similar disposition is observable in certain genera of Solanaceae, as Datura and Cestrum, though in these the lateral nerves are more ramified; and their trunks generally less distinct in the laciniae. It appears therefore that, in adopting M. Cassini's theoretical expression for the vascular structure of

point of adhesion, and in such a degree that the corresponding branches of the neighbouring segments unite with each other considerably above the middle of the tube, forming a common trunk, which is continued to the base of the ovarium; the five trunks thus formed uniting internally with those from which the filaments originate, and externally with the axes of the opposite segments of the calyx. The middle nerves of the segments of the corolla are in like manner continued below the point of cohesion to the real base of the tube.

The analogy of this disposition of vessels in the corolla of Goodenoviae to that of Compositae is obvious. To assimilate entirely the two structures, it is only necessary to suppose a deeper division of the five primary vessels of Compositae, and a continuation of the tube of the corolla below its apparent base to that of the ovarium. That this is its real origin, is rendered not improbable both from the analogous structure now described in the family of Goodenoviae, and from the manifestly hypogynous corolla of Brunonia; a genus in many respects still more nearly related to Compositae, though differing in the disposition of the vessels of its corolla.

The more direct proof of this origin, derived from an examination of the surface itself, can hardly, perhaps, be expected where the parts are generally so small, and where, as I conceive, the surface of the pericarpium in many cases depends less on that of the cohering envelopes, than on the proper figure of the ovarium itself, as seems to be likewise the case in Umbellate.

There are however a few cases in which this opinion respecting the origin of corolla in Compositae may derive some additional support from the appearance of the surface of the ovarium, as in Marshallia and Hymenopappus, in both of which genera, but particularly in the former, it is marked with ten longitudinal striae, of which the five stronger are continued into the five nerves of the corolla, the remaining five ending abruptly at the apex of the ovarium.
the corolla of Compositæ, one peculiarity actually existing is lost*.

The principal peculiarity, however, consists in the corolla of a syngenesious plant, when reduced to its smallest number of nerves, having these nerves alternating with its segments in the tube. I am acquainted with no instance of this order of reduction in the nerves of any other monopetalous corolla, but I observe an apparent tendency to it in *Portlandia* and *Catesbaea*. In the tube of the corolla of both these genera there are ten nerves, of which the five that alternate with the segments are manifestly stronger, and seem to furnish the greater part of the vascular system of the upper part of the tube and of the segments; the intermediate nerves being there somewhat like recurrent branches.

I shall conclude this subject by observing, that although the existence of nerves alternating with the segments of a monopetalous corolla, dividing below the sinus and uniting their branches at the apex of the segment, be rare, this disposition is comparatively frequent in a monophyllous calyx, especially where its aestivation is valvular. Labiatae furnish the most striking examples of this structure. I am not however acquainted with any instance of a calyx having five nerves only, and those alternating with its segments.

The aestivation or condition of the corolla before expansion is the subject of my second remark on Compositæ. I have, in the

* A still stronger objection to M. Cassini's definition is, that while its application to Compositæ is only hypothetical, it very nearly corresponds with the actual disposition of vessels in certain polypetalous genera. Thus in *Pittosporum revolutum*, each of the petals has three nerves with distinct origins. Of these the two lateral, evidently within the margins, less so, however, than in *Hymenopappus*, are quite simple in the unguis, and ramify more or less in the laminae, near the top of which they unite with each other and with the middle nerve.
observations formerly quoted, stated this to be *valvular*, that is, having the margins of the segments applied to each other and dehiscing like the valves of a capsule. As I have remarked in the same place that this aestivation exists in several other families, it is rather surprising that M. Cassini, in the abstract of his third memoir given in the *Nouveau Bulletin des Sciences* for last October, should seem to consider this character as peculiar to Compositae*. It appears also that he is not aware of any exception to it in the class. I have however, in a different part of the same essay, noticed one exception existing in *Chuquiraga*, and I have since found another in *Corymbium*. In both these genera the aestivation is induplicate, that is, the margins of the segments are doubled in, so that in the unexpanded state none of them are visible. I have

* Since this paper was read, M. Cassini has published his memoir (in the *Journal de Physique* for February 1816), in which he states the same aestivation to exist in certain other families, namely, Campanulaceae, Lobeliaceae, and Rubiaceae. This observation, if applied to the whole of these families, as is evidently the author's intention, is correct only with respect to Campanulaceae, from which I have separated Stylideae as a distinct order, partly, as I have stated, on account of its imbricate aestivation. In a considerable part of the Lobeliaceae of Jussieu, which includes my Goodenoviae, the aestivation is not valvular but induplicate: and though in Rubiaceae the valvar mode is very general, there are many remarkable exceptions to it, as *Gardenia, Ixora, Pavetta, Coffea*, and several other genera, where it is unilaterally and obliquely imbricate, as in most of the Apocineae, with which Linneus united them under the name of Contortae, derived from this very circumstance. On this subject I may be allowed further to remark, that M. Cassini, who in the memoir now cited has repeatedly asserted his claim to the priority of the observation on the disposition of vessels in the corolla, has in treating of its aestivation omitted to notice what had been already published respecting it in my essay above quoted, where I conclude he must have seen my observation, as he refers to the sentence containing it. The aestivation of corolla in Compositae is also noticed in the observations on *Brunonia*, contained in my *Prodromus Florae Novae Hollandiae*, which I suppose he has not seen: I may therefore, for the general importance of aestivation of calyx and corolla in affording characters both for Orders and Genera, refer him to almost every page of the same work, and to its preface, for an observation on the degree of attention that had been previously paid to this point of structure, which will enable him to correct in some measure his own remark on the subject.
Mr. Brown's Observations on the

in the passage referred to observed that the valvular and induplicate modes of aestivation easily pass into each other, merely by an addition or abstraction of the elevated margins of the laciniæ: instances of their abstraction, and of the consequent conversion of the induplicate into the valvular mode, occur in several Goodenoviæ, and in some Convolvulaceæ and Solanaceæ; while Chuquiraga and Corymbium are examples of their addition in an order where they are generally wanting.

My third remark is entirely borrowed from Schkuhr*, who states that in all Cichoraceæ or Ligulatae the pollen is angular, and that in Corymbiferae and Carduacea, or in all tubular florets, it is spherical or oval.

All the figures which this author has given of pollen in Cichoraceæ represent it as a regular icosahedron, except that of Gero-pogon glabrum, which is a dodecahedron. I believe neither of these forms of pollen has been observed in any other family of plants.

A fourth remark on Composite I do not offer with absolute confidence, as it is opposed to the statement of M. Cassini, on whose general accuracy I have great reliance. It relates to the disposition of the branches of the style or stigmata, which according to M. Cassini are lateral, or right and left with relation to the axis of the common receptacle; whereas, I consider them as anterior and posterior, though in many cases by a slight degree of twisting in the style they acquire what M. Cassini regards as their original position.

This may seem a point of very little consequence to establish. Independent however of the necessity of minute accuracy in every case, it appears to me to have some connexion with my fifth remark, which relates to the internal structure of the Ova-

I am not aware of any thing having been yet said on this subject further than that it contains a single erect ovulum, inserted at the base of the cavity. In addition to this, I observe in the greater part of Compositae, whose ovarium I have examined, two very slender filiform cords, which, originating from opposite points of the base of the ovulum, or of its short footstalk, run up, and are more or less connected with, the lateral parietes of the ovarium, until they unite at the top of its cavity, immediately under the style; between which and the ovulum a connexion is thus formed. In many cases, as in *Liatris spicata* and *Tussilago odorata*, these cords are easily separable from the ovarium, and have such a degree of tenacity that they may be extracted from it entire, along with the ovulum. In other cases they more firmly cohere with the sides of the cavity: and in those plants in which I have been unable to see them distinctly, I conclude they are not absolutely wanting, but that their connexion with the parietes is still more intimate.

These cords may be supposed to consist either solely of the vessels through which the ovulum is fœcundated, or to contain also the remains or indications of a system of nourishing vessels, or chordæ pistillares, the position of which points out the true nature of the ovarium in this class, or the relation it has to the apparently less simple ovarium of other families. I am inclined to adopt the latter supposition. In order, however, to be understood on this subject, it is necessary to premise that I consider the pistillum or female organ 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 parts 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 which is in some degree indicated externally by the division of the style, and internally by the two cords which I consider as occupying the place of two parietal placentae, each of these being made up of two confluent chordulae, belonging to different parts of the compound organ. I am well aware how very paradoxical such an hypothesis must seem, especially when applied to a structure apparently so simple as that of the ovarium of Compositæ; and I therefore regret that I am not yet fully prepared to bring forward in its support a series of facts already in my possession, consisting of deviations from the usual structure of organs, and particularly of instances of stamina changed into pistilla.

In the mean time it may give some plausibility to the hypothesis to remark, that there are families of plants strictly natural in which a series of degradations exist, if I may so speak, from the assumed perfect pistillum, to a structure as simple as that of Compositæ.

Thus in Proteaceæ we have the type of the perfect pistillum in the many-seeded folliculus of Embothrium; the first degree of imperfection in that of Grevillea, where only one ovulum of each series remains; a further reduction in the indehiscent monosperous fruit of Leucospermum, in which the insertion of the ovulum is lateral; and the simplest form in Protea itself, where the
the single ovulum is inserted at the base of the cavity. Proteaceae, however, exhibit a series of obliterations in the parts of a single pistillum only. An illustration more in point, though somewhat less perfect as a series, may be taken from Goodenovia, an order of plants very nearly related to the class of which we are treating. In the greater part of Goodenovia, the ovarium is bilocular, each cell having an indefinite number of seeds; in the greater number of Scavola, each cell is reduced to a single ovulum; while in some species of the same genus, and in all the species of Dampiera, the ovarium, though retaining its external characters, is reduced to a single monospermous cell, with an erect ovulum, as in Compositae. The natural order Cruciferae exhibits also obliterations, more obviously analogous to those assumed as taking place in syngenesious plants; namely from a bilocular ovarium with two polyspermous parietal placentae, which is the usual structure of the order, to that of Isatis, where a single ovulum is pendulous from the apex of the unilocular ovarium. 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 placentae, as that of Compositae has to its filiform cords, a second species (B. cordata) exists in which these placentae are polyspermous.

My sixth observation on Compositae regards the order in which the florets expand. To understand the relation this order has to that of other families, it may be necessary first to make a few remarks on the more usual modes of inflorescence.

It is well known that in an absolutely simple spike the expansion of the flowers is ascendent; that is, begins at the base of the spike and proceeds regularly upwards. To this order very few real exceptions occur, several of the apparent deviations being connected with some degree of composition in the spike.
It is also known that in a compound spike, while the expansion of each partial spike is ascendent, that of the spikes, with relation to each other, is descendent; the terminal spike expanding first, and the others in a regular succession downwards. This order, indeed, admits of a greater number of exceptions than that of the simple spike; several of them apparently depending on the density or imperfect composition of the spike; and the more usual deviation consisting in the expansion beginning below the apex, and proceeding in opposite directions from the point of commencement; the upper portion following the order of the simple, the lower that of the compound spike.

The simple racemus and corymbus are obviously very slight modifications of the spike, and in their expansion obey the same law. A syngenesious compound flower, or capitulum as it may be termed, is merely a spike with a shortened and generally depressed axis. In cases where this capitulum is unquestionably simple, the expansion of its flowers is uniformly from circumference to centre, or in the order of the simple spike. Where the capitula are disposed in a corymbus, which is their usual mode of combination, the order of the compound spike is observed; their expansion with relation to each other being from centre to circumference. In their denser aggregations, whether forming a compound spike or head, the same order of expansion obtains, and it continues though the florets in each common calyx or involucrum should be lessened in number, or even reduced to unity, as in Echinops and Rolandra.

* The most remarkable exception to the order of the compound spike exists in the compound umbel of Umbelliferae, of which the outer umbellulae expand somewhat earlier than the central; and as this order of expansion seems to extend through the whole natural family, Astrantia, in which the terminating umbel expands much earlier than those of the lateral branches, cannot be considered as having a compound umbel.
The absolute constancy in the order of expansion of the simple capitulum from circumference to centre, and the more or less complete inversion of this order in the compound capitulum, appear to afford tests of the real structure in certain cases where the degree of composition, and consequently the proper names of some of the parts, might otherwise be doubtful.

To illustrate this I select two genera, Lagasca and Cæsulia. In Lagasca the capitulum, both from its form and the appearance of its involucrum, might at first sight be considered as simple: on examination, however, it is found to differ from all simple capitula, in each floret being furnished with a tubular envelope, exactly resembling a five-toothed perianthium, but which does not in any state cohere with the included ovarium.

Cavanilles, by whom the genus was established, regarded this envelope as a genuine perianthium, and erroneously described its tube as cohering with the ovarium; an error which is copied in Persoon's Synopsis Plantarum, where the genus is consequently placed in Polygamia æqualis. Jacquin, who has published Lagasca under the name of Noccea mollis*, also describes the envelope of each flower as a proper perianthium, although aware of its tube being distinct from the ovarium. Subsequent writers have, indeed, more correctly referred the genus to Polygamia segregata; but the terms involucellum and calyculus, which they apply to the envelope in question, appear to me objectionable, for a reason that will presently be given.

Three suppositions may be formed respecting the nature of this envelope, namely, either that it is an involucrum reduced, as in Echinops, to a single flower; secondly, that it is a proper perianthium, which in appearance it very much resembles; or thirdly,

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that it is more analogous to the outer calyx of Scabiosa, which M. Cassini seems to consider different in its nature from both these parts.

But the order of expansion in Lagasca, which is, though with some degree of irregularity, from centre to circumference, or that of the compound capitulum, seems to decide the question respecting the envelope of each flower, and to establish its identity with involucrum: nor does this involucrum differ materially from that of Echinops, except in the reduced number and confluence of its component parts.

The real structure of Casulia is perhaps less obvious.

This genus, which was first published by Dr. Roxburgh*, is referred by him to Polygania segregata; the tubular envelope or involucrum of each floret being described as distinct from the included ovarium.

Koenig, on the other hand, by whom the genus was discovered, and whose account of it is given in the same work, describes the partial involucrum of Roxburgh as the surface of the ovarium itself; its segments being, according to him, a pappus of two leaves. And lastly Willdenow, regarding this involucrum as merely paleae of the receptacle, refers the genus to Polygania equalis; in which order it is continued, both in Persoon's Synopsis, and in the second edition of Mr. Aiton's Hortus Kewensis.

This last view of the structure seems the most erroneous of any, and was probably adopted by Willdenow, in consequence of his having added to the genus a second species not really belonging to it, and which I shall have occasion to notice in another part of my subject.

An examination of the parts of fructification in different stages

* In Corom. Plants, i. p. 64. t. 93.
reconciles
reconciles the opposite statements of König and Roxburgh; for I find that at the time of flowering the envelope of each floret is, as Roxburgh has figured it, distinct from the ovarium, with which, however, in a more advanced stage its tube becomes firmly united; a fact that sufficiently accounts for König's description.

There is here, therefore, a nearer approach to a true perianthium than in the involucrum of Lagasea; but the expansion of the flowers being, as in that genus, from centre to circumference of the capitulum, I consider the envelope of Casulia as unquestionably an involucrum, and the genus consequently belonging to Polygamia segregata.

I may here remark, that the name Polygamiasegregata, invented by Linneus for those genera of Compositæ with densely aggregate capitula, is calculated to give an erroneous idea of the nature of the structure; the opposite term Polygamia congregata being, according to the view now taken, obviously more proper for those genera, at least, whose involucra contain several flowers. It is not unlikely, indeed, that Linneus himself was aware of the true nature of the inflorescence of these genera; but the term Polygamiasegregata would not have suited the artificial arrangement which he adopted in his subdivisions of the class, nor his including in it the order Monogamia; for with this order the single flowered genera of Polygamia segregata must then have been confounded.

It is a curious circumstance, that the order of expansion in Compositæ does not depend on the number of flowers actually existing, but on the effort, if I may so term it, made to produce them, manifested by the presence of an involucrum or common calyx, which is in some cases reduced to a single flower. The fact at the same time contributes to prove, that the whole natural class is formed on that plan of dense aggregation of flowers,
for which I have already attempted to show that certain parts of the structure of a syngenesious floret are peculiarly well adapted.

The circumstance, however, is not confined to Compositae, but exists in an equally remarkable degree in Gramineae.

I have formerly considered the gluma, or what Linneus has termed calyx, in this family of plants, as an involucrum.

In those genera where this gluma or involucrum contains several flowers their expansion is generally ascendent, or in the order of the simple spike. In a spike formed by these many-flowered glumaæ, as that of Triticum and Lolium, the expansion of the partial spikes, with relation to each other, is descendent, or in the order of the compound spike; in most cases, however, with that deviation, which I have already noticed, of the expansion commencing below the apex and proceeding in opposite directions. But as the same descendent expansion takes place in a spike formed of single-flowered glumæ, it may be inferred that the genuine type or most perfect form of a grass is to have several flowers in its gluma or involucrum: a view not only consistent with the fact of a great majority of the order having actually this disposition; but also with that peculiarity in the vascular structure of the inner valve of the perianthium; which, whether it be considered as indicating that this part is formed of two confluent valves, an opinion I have elsewhere* advanced, or merely as a transposition of vessels in a simple valve, analogous to that in the syngenesious floret, is evidently adapted to the many-flowered spicula, though equally existing in that with a single flower.

The resemblance between the outer calyx of Dipsaceæ and the single-flowered involucrum of Compositæ is so striking, that it

* In General Remarks on the Botany of New Holland.
cannot appear very paradoxical to consider them as both of the same nature.

In Dipsaceæ, however, there is no instance of the outer calyx containing more than one flower, and the evidence afforded by inflorescence on this subject is not altogether satisfactory.

In Dipsacus it has been long noticed that expansion begins about the middle of the spike, and proceeds in opposite directions from the point of commencement: this order is evidently more analogous to that of the compound than of the simple spike; there being several instances of spikes manifestly compound, where the same inversion of the upper part exists.

But a fact, which I do not find anywhere observed, respecting the inflorescence of certain species of Scabiosa, particularly succisa and atropurpurea, is not so easily reconcilable with the compound spike: in these, and I have reason to think in many other species of the genus, the expansion begins simultaneously at the base and middle of the capitulum, proceeding regularly upwards from both points. Were this the case in all Scabiosæ, the compound nature of the spike in Dipsaceæ, although by no means proved, might be considered not improbable: there are, however, several species of the genus in which the order of expansion is altogether that of the simple spike.

Connected with the subject of inflorescence, I may remark that priority of development, whether among similar parts in the same flower or the different flowers of the same spike, is generally accompanied with greater perfection of these parts or flowers, and apparently with greater power of resisting the ordinary causes of abortion or obliteration.

I have formerly * observed respecting several natural families of plants, in which the stamina are in a determinate number, but a

number subject to reduction, that this reduction, where the flower is of a regular form, takes place in the same order in each natural family. Thus in \textit{Junceae}, which are generally hexandrous, the triandrous species have their stamina constantly placed opposite to the three outer leaves of the perianthium, while in Restiaceae, Asphodelaceous, and I believe in a great part of the regular-flowered Liliaceae, in certain species of which a similar reduction occurs, the stamina in the triandrous species are placed opposite to the inner leaves or segments of the perianthium. But in both cases the greater perfection of those stamina that exist in genera or species reduced to the smallest number, is indicated, where there is no reduction, by the earlier bursting of their antheræ; so that from this circumstance the order of reduction or abortion of stamina in any natural family may with some confidence be predicted by an examination of those genera where the number is complete.

Wherever the separation of sexes takes place, it may be assumed that the female flower is the more perfect production. And if this be admitted, where both sexes exist in the same simple spike the female should be found at its base, or where expansion commences, which is almost uniformly the case. For the same reason, in the trifid or trichotomous inflorescence, the female should be placed in the centre, which is also generally the fact*.

This connexion between præcocity and perfection of development is even more constant than the order of expansion in certain forms of inflorescence; as it is found to extend to several of the exceptions to this order.

Thus in the apparently simple spike of \textit{Poterium}, where the order of expansion is descendent, the female flowers occupy the upper

* To this order the most remarkable exception occurs in \textit{Begonia}, in which the male flowers are central, and expand long before the lateral female flowers.
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upper part of the spike; and this relation also exists in the more compound inflorescence of Ricinus, Syphonia, and Celtis, in which the order of expansion is equally inverted.

It may seem rather paradoxical to select Euphorbia as an example of the same relation; this genus being considered by Linneus, and the greater part of the botanists who have adopted his system, as having a dodecandrous hermaphrodite flower. We have already, however, I believe, sufficient evidence that this supposed hermaphrodite flower is in reality formed of several monandrous male flowers surrounding a single female*.

In conformity with this view of its composition, and with the relation above attempted to be established, the development of the pistillum precedes that of the stamina in many species of the genus.

It is more difficult to determine whether this order of expansion and relative position of sexes in Euphorbia be in conformity with the general rule, or an exception to it. For its faciculus of flowers may be considered as analogous either to the simple spike, and consequently having an inverted order of expansion, as in Allium descendens, and certain species of Grevillea and Anadenia: or it may be assimilated to the compound spike, as in several species of the genus the male flowers appear to be separated into fasciculi;

* To the arguments I have adduced (in my Remarks on the Botany of New Holland) in support of this opinion, I am now enabled to add the more direct proof derived from certain species of Euphorbia itself, in which the female flower is furnished with a manifest calyx. I have formerly observed, that in a few cases the footstalk of the ovarium is dilated and obscurely lobed at top: but in the species now referred to it terminates in three distinct and equal lobes of considerable length, and which being regularly opposite to the cells of the capsule may be compared to the three outer foliola of the perianthium of Phyllanthus, between which and the cells of the capsule the same relation exists. This calyx is most remarkable in an undescribed species of Euphorbia from the coast of Patagonia, in the Herbarium of Sir Joseph Banks: but it is observable, though less distinct, in E. punicea and several other species.
and according to this view the order of expansion is direct, the central female flower being the representative of the terminal partial spike.

There is even a third species of inflorescence with which the fasciculus of *Euphorbia* may be compared, namely, that consisting of one or more verticilli with a single flower in the centre. In this, which may be considered a modification of the spike or umbel, the usual order of expansion seems to be from centre to circumference. Its simplest form occurs in an unpublished New Holland genus of the same natural family with *Euphorbia*, in which a single verticillus of male flowers surrounds the central female flower. *Lambertia* may be considered as another instance of the same mode, and as far as can be determined, in a case where the flowers are hermaphrodite and their expansion nearly synchronous, following the same order. In all the known species of this genus the leaves are verticillate, and uniformly in threes: in *L. formosa* and *inermis* the involucrem constantly contains seven flowers, while in *L. uniflora* it is reduced to one flower. The seven flowers of the two former species I consider as made up of two verticilli, in number of flowers corresponding with that of the leaves, and of a single central or terminal flower; to which terminal flower *L. uniflora* appears to be reduced. From this order of reduction it may be assumed as more probable that species of *Lambertia* should be found with ten or four flowers in the involucrem than with nine, six, or three. But greater permanence being, as has been already remarked, generally connected with greater perfection, it becomes also probable that, if any species of this genus should be discovered with androgynous capitula, the female flower will occupy the centre as in the genus of *Euphorbiaceae* above referred to.

It is worthy of remark, and may indeed appear in some degree
at variance with the foregoing observations, that although in an assemblage of flowers priority of expansion generally indicates a greater degree of perfection, and consequently a more ready convertibility of the hermaphrodite into the female flower; yet in a hermaphrodite flower the development of stamina usually precedes that of pistilla. The most remarkable exceptions to this order of development which I at present remember, occur in several species of Plantago, where the stigmata are fully developed, and often even withered, before the bursting of the antheræ.

I now proceed to make some remarks on certain genera of Compositæ which either occur under different names in late systematic works, or whose structure and limits seem to be imperfectly understood.

Soliva

was established in the Prodromus Floræ Peruvianaæ et Chilensis, and is adopted by Persoon in his Synopsis Plantarum. To this genus Hippia minuta of the Linnean Herbarium unquestionably belongs, and it is perhaps not specifically distinct from Soliva pedicellata. But on comparing the structure of this plant with the figures and descriptions, given by Mons. de Jussieu (in the fourth volume of the Annales du Museum,) of the different species of his Gymnostyles, it appears to me evident that the whole of this genus is referable to Soliva, whose principal characters would consist in the want of corolla or perhaps its accretion with the persistent style in the female florets; in the pericarpia being more or less winged, and presenting their disk instead of their margins to the centre of the capitulum.

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Sir James Smith has already pointed out the error M. de Jussieu has been led into in referring *Hippia minuta* Linn. to his *Gymnostyles nasturtiiifolia*, a plant much more nearly related to *Hippia stolonifera* of Brotero; which, from repeated examination, I can with confidence refer to the same genus.

*Gymnostyles anthemisfolia* is stated by M. de Jussieu to be a native of New South Wales: but as I have observed it only in cultivated ground in the neighbourhood of Sydney, and as it has certainly been found in South America, of which four other species of the genus are unquestionably natives, it has probably been imported into New South Wales, perhaps from Brazil; nor is it altogether improbable that *Hippia stolonifera* of Brotero may have been introduced into Portugal from the same quarter.

**Grindelia,**
described by Willdenow in the Transactions of the Natural History Society of Berlin for 1807, and subsequently in his *Enumeratio Plantarum Horti Berolinensis*, flowered in Kew Gardens for the first time in 1815, when I had an opportunity of examining it, and of determining its very near affinity with *Donia*, a genus proposed in the second edition of *Hortus Kewensis*, and adopted by Mr. Pursh in his *Flora of North America*: the principal distinction between these two genera consisting in a difference in the number of radii of the pappus, which in *Grindelia* is described by Willdenow as of two rays, and according to my observations has more frequently one only. But as even in *Donia* the number of rays, though indefinite, is variable, and the structure of the pappus is very nearly similar in both genera, which in all other respects agree, it may be perhaps expedient to unite them under the name of *Grindelia*, which was first in order of publication.

**Tridax**
Tridax

was first established by Linneus, in Hortus Cliffortianus, from a specimen found at Vera Cruz by Houston, and sent to Clifford by Miller. As Linneus had no specimen in his own collection, that in Clifford's Herbarium, now in the possession of Sir Joseph Banks, is the only authority for the genus; and on examining this specimen I find the pappus to be not setaceous, as Linneus has described it, but distinctly plumose. There is, therefore, no difference whatever between Tridax and Balbisia of Willdenow; and on comparing Tridax procumbens with Balbisia elongata, I cannot satisfy myself that they are even specifically distinct.

Angianthus.

Angianthus tomentosus of Wendland's Collectio Plantarum, (vol. ii. p. 32. tab. 48.) published in 1809, is evidently the same plant as my Cassinia aurea, described in the fifth volume of the second edition of Hortus Kewensis, which did not appear till 1813. Wendland neither mentions the native country of his Angianthus, nor from whence he received it. He must, no doubt, however, have obtained it from Kew Garden, where it was introduced and flowered from seeds which I collected in 1802, in the island of St. Francis, on the South coast of New Holland.

Meyera.

This genus, described by Schreber in his edition of the Genera Plantarum, is not adopted by Willdenow. Swartz, however, in his Flora Indica Occidentalis, has referred to it, and I have no doubt correctly, Eclipta sessilis of his Prodromus. On comparing this species of Meyera with a plant in Sir Joseph Banks's Herbarium, collected in Peru by Dombey, and which exactly agrees with Sobreya
Sobreya of the Flora Peruviana, it appears evident that this genus is reducible to Meyera. *Enhydra* of Loureiro’s Flora cochinchenensis, though described somewhat differently, and referred to Polygamia segregata, I have little doubt, belongs to the same genus; as does unquestionably *Hingstha* of Roxburgh’s unpublished Flora Indica, where it is also referred to Polygamia segregata. This plant, which I have examined, is scarcely distinct from a species of *Meyera* that grows in New South Wales.

*Cryphiospermum* of Mons. de Beauvois’s interesting Flore d’Oware et Benin, although reduced by him to Cichoraceae, I have but little hesitation in referring also to *Meyera*. And lastly, *Casulia radicans* of Willdenow, likewise a native of æquinoctial Africa, is perhaps not specifically different from *Cryphiospermum repens* of Mons. de Beauvois.

**Melampodium**

was established by Linneus, in the first edition of Genera Plantarum and in Hortus Cliffortianus, from a specimen found by Houston near Vera Cruz, and communicated by Miller to Clifford, in whose Herbarium, now forming part of the collection of Sir Joseph Banks, it still exists. It does not appear that this plant has been found by any other botanist than Houston; and according to the character given by Linneus of *Melampodium*, it must be considered the only species of the genus.

In the second edition of Species Plantarum he added to it, but with a doubt, *Melampodium australi*, a plant adopted from Læsling, according to whose description the pappus and surface of the seed are widely different from those of the original species. Swartz has referred to the genus a third species, *M. humile*, entirely distinct in these respects from both the former; and more recently a fourth species, *M. longifolium*, with seeds differently modified from all the others, has been annexed to it.

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But if these four plants, so extremely different from each other in pappus and form of the pericarpium, really belong to the same genus, as their habit seems strongly to indicate, there can be no reason to separate from them Aleina of Cavanilles, erroneously considered by Willdenow as a species of Wedelia; and Dysodium of Richard, published in Persoon's Synopsis, though differing from all the others in the form of its pericarpium and in that of its receptacle, must also be reduced to this genus. If, however, the part described by Linneus as pappus in Melampodium americanum be really such, and if the pericarpium itself vary so widely both in form and surface, it would be inconsistent with the principles of division generally adopted in Composite, to unite all these plants into one genus, notwithstanding their great resemblance in habit as well as in the other parts of fructification; and it would be at least in vain to look for any combining character in this part of their structure.

A careful examination of the female flowers, especially in an early stage, removes this difficulty, by proving that the supposed external coat of the ovarium, with its various inequalities of surface, some of which have been described as pappus, is in reality an involute bractea or foliolum of the involucrum, like that of Micropus, completely inclosing the ovarium, but from which in several species of the genus it is entirely, and in others in great part, distinct.

Craspedia first appears in Forster's Prodromus Florulæ Insularum Australiæm, where an essential generic character is given, but no description of the species. The genus is adopted and the character received without remark by Willdenow in his edition of Species Plantarum, and by Persoon in his Synopsis. Among George Forster's drawings of subjects of natural history made in

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Cook's second voyage, and now in the library of Sir Joseph Banks, there is a figure of this plant, from which it appears that he originally referred it to Stachelina; a proof that he had not at that time very carefully examined it. It is not improbable therefore that he afterwards proposed it as a distinct genus, belonging to Polygama segregata, from finding that this had been already done by Solander, whose name (Cartodium), however, he did not think it necessary to adopt, and with whose generic character he probably was not acquainted. In his own he very erroneously states that there is no partial involucrum, and hence perhaps M. Labillardiere entirely overlooked Craspedia when he established his Richea from a nearly related species of the same genus. That such is the case I have long since briefly noticed*, and have ascertained by a comparison of the specimen of Craspedia uniflora in George Forster's Herbarium with Richea glauca of Labillardiere, and other species of the same genus which I have observed in New Holland.

M. Labillardiere's character of Richea is essentially correct. It is well to remark, however, that his general involucrum is formed of the bracteae subtending and in equal number with the outer partial capitula; and that the general receptacle has no other paleae than the analogous bracteae of the inner capitula. It is the more necessary to take this view of the structure, as I have found in New Holland a nearly related genus (Calocephalus), which differs from Craspedia and Richea in the want of these bracteae, as well as in the partial receptacles being without paleae, and in the rays of the pappus being plumose only in the upper part. I have also another genus of this tribe (Leucophyta) from the same country, differing from Calocephalus in having a general involucrum consisting of a few short bracteae, in the squamae of its partial involucra being concave and bearded at top, and in the rays

of its pappus being plumose through their whole length, as in Craspedia, from which it is distinguished by the want of paleæ on the partial receptacles, and very remarkably in habit.

I have selected the foregoing genera as having been either published under different names, or, as it appears to me, unnecessarily subdivided. In this extensive class it would not be difficult to point out a much greater number consisting of species improperly united. One very remarkable case of this kind is the genus GALEA, to which, as I intend to enter fully into the history and affinities of its species, I shall confine myself.

This genus was established by Linneus in the sixth edition of his Genera Plantarum, where the natural character is given: but the following essential character, which is still retained, appears for the first time in the twelfth edition of Systema Naturæ, in the third section of Polygamy aequalis:

"Receptaculum paleaceum, Pappus pilosus, Calyx imbricatus."

The species originally referred to Calea, in the second edition of Species Plantarum, are C. jamaicensis, oppositifolia, and Amellus, described from specimens in Browne's Jamaica Herbarium, which he had received a few years before, and incorporated with his own.

These three plants Linneus had originally referred to Santolina*, for which it seems to me rather less difficult to account than for his afterwards uniting them together to form his genus Calea; two of them, according to his descriptions†, though in reality one only, being without pappus, and in other respects corresponding with the generic character of Santolina; and the third, which

† Loc. cit.
Browne had doubtfully referred to the same genus, though furnished with pappus, agreeing with the others in having opposite leaves.

But the difference in habit between all these plants and the original species of Santolina is so great, that it probably afterwards determined Linneus to remove them from that genus; and although he found a sufficient generic character in the pappus of Calea jamaicensis only, he united with it the two other species, for a reason perhaps similar to what I have supposed led him to separate all the three from Santolina. It is remarkable, however, that not one of these three original species of Calea corresponds with his character of the genus; and that they in reality belong to three very distinct genera, on principles which, I conceive, Linneus himself would have admitted.

The *first* species, Calea jamaicensis, is the only one that even seems to agree with the generic character, in having pappus which at first sight (to the naked eye at least) might appear simply capillary, but which on a closer examination proves to be of a very different and nearly peculiar structure. Of this species I have seen only one authentic specimen, received from Browne by Ehret, and now in Sir Joseph Banks's Herbarium. The specimen in question, though incomplete, evidently belongs to the same species with "Conyza fruticosa cisti odore, floribus pallide purpureis, summitatibus ramulorum insidentibus," of Sloane*, of which I have examined the original very perfect specimens in his Herbarium, preserved in the British Museum†; and am satisfied that its pappus is of the same structure as that of Calea cordifolia of Swartz, who has well described it, but who has at the same time given a different account of that of C. jamaicensis‡. These

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* Hist. Jam. i. p. 257. tab. 151. fig. 3.
† Herb. vol. v. fol. 14 & 15.
‡ In Flor. Ind. Occid. vol. iii. p. 1328.
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two plants are the only published species of this genus, for which the name of Calea should be retained, and which may be distinguished by the following characters:

Calea.

Calea species Linnei.


OBS. In Sir Joseph Banks's Herbarium there are two plants very nearly related to Calea, differing from it merely in having a radius of ligular female florets. If this difference be considered sufficient to constitute a genus, it may be named Cactacte. The first of these plants (C. urticifolia), with nearly ovate acute crenated leaves, found by Houston near Vera Cruz, is *Solidago urticaefolia* of Miller, by whom it appears to have been cultivated. The second, with deeply lobed or pinnatifid leaves (C. pinnatifida), was lately sent from Brazil by Mr. Sellow.

The second Linnean species, Calea oppositifolia, has very little affinity to the first. In attending merely to the technical character of Santolina, it might be referred to that genus; but it dif-

* Calyx communis Linnei. † Corolla communis Linn.
fers so widely, both in other points of structure and in habit, that there can be no question of the propriety of separating it, which may be done by the following character, and under the name of

**Isocarpha.**


**Obs.** I have so constructed the generic character of Isocarpha as to include *Spilanthus atriplicifolius* of Linneus, which, however, differs very remarkably from *Calea oppositifolia* in having alternate leaves and solitary capitula, as well as in the texture and form of its paleæ.

The pappus, consisting of three or four very minute aristæ, described by Swartz* in *Calea oppositifolia*; I have not been able to observe in any of the specimens that I have examined.

The third species, *Calea Amellus*, is probably the same plant as *Bidens scandens*, which Linneus described in Hortus Cliffortianus, but, having no specimen in his own collection, appears to have forgotten. The original specimen in Clifford's Herbarium, now in the possession of Sir Joseph Banks, evidently belongs to the same species, and perhaps to the same individual, with a specimen in Miller's collection, which Mr. Dryander compared, and considered to agree with *Calea Amellus* of the Linnean Herbarium. The true synonym, therefore, of *Calea Amellus* is "*Bidens suffruti-

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natural Family of Plants called Composite.

cosus vimineus, foliis oblongo-ovatis oppositis, floribus comosis” of Browne*; while Linneus has quoted and even derived his specific name from the same author’s “Amelius ramosus, foliis remotis terminalibus, fulcris longis divaricatis †;” which, instead of belonging to Bidens scandens, I believe, for the following reasons, to be Bidens nivea. 1st, The figure in Burmann’s Thesaurus Zeylanicus‡, quoted by Browne for his plant, though belonging to Lavenia erecta, is at the same time a good representation of Bidens nivea, and very unlike Bidens scandens. 2dly, Browne’s description in most respects very well agrees with the former species, but certainly not with Bidens scandens. And 3dly, I infer that Bidens nivea was actually in Browne’s Herbarium, from finding it in the Flora Jamaicensis published in the 5th volume of Amoenitates Academicae, and formed chiefly from that Herbarium; though a very erroneous reference for this species is there made to Browne’s first Santolina, which, from the description, cannot possibly belong to Bidens nivea, but is probably Verbesina gigantea.

M. Decandolle has lately established a new genus, Salmea, consisting of Bidens scandens, Bidens hirsuta, and a third species which I have not examined. These plants are very properly separated from Bidens by this excellent botanist, and well distinguished both from that genus and from Melananthera. It is rather remarkable, however, that he has not thought it necessary to compare Salmea with Spilanthes, from which, according to his description, it differs only in its imbricate involucrum. But as in Spilanthes the foliola of the involucrum are not exactly equal, and are disposed at least in a double series, I have in-

* Browne, Jam. 317.
† l. c.
‡ Eupatoriophalacrum scrophulariae aquaticaæ foliis oppositis, Burm. Thesaur. Zeyl. p. 95, t. 42.
introduced some additional distinctions into the following character of

**Salmea.**


**Involucrum imbricatum. Receptaculum conicum, paleis persistentibus. Flosculi tubulosi, uniformes, hermaphroditii (5-fidi). Antherae sagittatae. Achenium verticaliter compressum, bi-aristatum; aristis persistentibus (apteris v. alatis).**

**Frutices (Americæ æquinoctialis) sæpius decumbentes. Folia opposita, indivisa. Inflorescentia terminalis, subpaniculata, vel corymbosa. Corollæ albidae. Paleæ receptaculi post lapsum pericarpiorum persistentes.**

**Obs.** Of this genus I have examined specimens of three species in Sir Joseph Banks's Herbarium, differing from each other in several very remarkable characters.

1. **Salmea scandens,** (Decand. l. c.) in which the aristæ are equal and without any membranaceous border: stigmata remarkably dilated, tongue-shaped, obtuse, not hispid, obscurely papulose, and apparently without any terminal appendix: style dilated at the base into a hemispherical bulb which is truncated underneath.

2. **Salmea hirsuta,** (Decand. l. c.) whose aristæ are unequal; the inner, which is the larger, being furnished with an evident ala; the outer having a narrow margin only: stigmata sharp and spreading: style dilated into an ovate bulb which has an attenuated base.

3. **Salmea? curviflora** (nob.) differs from both the preceding in the tube of its corolla being remarkably bent outwards. In place of the inner arista there is a broad obtuse wing, of which the inner margin is straight and thickened, the outer continued down nearly to the base of the pericarpium: the outer arista is winged: and
and besides these, one or two minute processes are generally ob-
servable. Stigma revolute*.

In the 12th edition of Systema Naturæ, Linneus added to his
genus Calea a fourth species, namely Calea scoparia; for what rea-
son it would be difficult to discover, as it does not resemble, either

* In the remarkable character of its re-curved florets, as well as in some other respects,
this species of Salmea agrees with Spilanthus arbores of George Forster (in Commentat.
Gotting. ix. p. 66.), of which he originally formed his genus Laxmannia; from a very er-
roneous view of its structure, however, having described the Nectarium or glandula epigyna
as a "germen superum;" the real, though imperfect, germin with its two aristae as a
"perianthium bidentatum," and consequently referring the genus to Polygami segregata.

When he afterwards corrected these errors and reduced Laxmannia to Spilanthus, he
did not discover that he had only the imperfect hermaphrodite or male plant before him.

That Spilanthus arbores is really dioecious, I have ascertained from the examination of
numerous specimens collected by Sir Joseph Banks in the Island of St. Helena, where it
forms a small tree called by the inhabitants White-wood. It is Bidens arbolae and per-
haps also Spilanthus tetrandrus of Dr. Roxburgh's List of Plants appended to General Beaton's Tracts on St. Helena; the former being probably the female, the latter as tarved variety of the male plant.

In re-establishing Spilanthus arbores as a genus, sufficiently distinct from Bidens, Spi-
lanthus, and Salmea, it will not, I conclude, be considered expedient to recur to Forster's
name Laxmannia, which as far as relates to this plant is connected only with a series of
blunders, was abandoned by the author himself, and has since been applied to another ge-
nus already generally adopted. It may be distinguished by the following character, and
named

PETROBILUM.

Involucrum polyphyllum subduplci serie: exteriore breviore, foliolis paucioribus. Re-
ceptaculum paleaceum, planiusculum. Flosculi dioeci, tubulosi, 4-fidi: Masculi: Anthe-
ris exsertis; Stigmatibus acutis hispidulis: Feminei: Staminibus sterilibus; Stigmatibus
acutis recurvis. Achenium v. parallelo compressum v. angulatum; angulis (2-3) aristatis:
aristis persistentibus, antrorsum denticulatis.

Arbor (Insulae S. Helenæ). Folia opposita, indivisa. Panicula terminalis, brachiata. In-
volverum oblongum. Paleae receptaculi squamis involucris similales. Corollae ochroleu-
cae, tubo arcuato-recuro (ut capitulum primo intuitu radiatum videatur). Mas. Antheris
nigricans, basi emarginatis, appendice apicis brevissimo, acuto; loculis vestigii septi
longitudinalis instructis. Fem. Staminibus sterilibus distinctis, antheris sagittatis cassis.
Mr. Brown’s Observations on the

in its fructification or habit, any of the three genera of which, as has been shown, Calea was originally composed. This fourth species, which he had at first referred to Chrysocoma*, is now known to be dioecious;—Browne, by whom it was first described and figured, and one of whose specimens I have examined, Linneus, and even Swartz when he published his Observationes Botanicae, being acquainted with the male plant only; which, however, all of them considered hermaphrodite: nor is there any reason to doubt that Gärtner's genus Sergilus is also the male of this species; although he has ventured to describe the colour of the embryo, deceived, probably, by the size of the imperfect ovarium, and the colour of its inner surface.

Professor Swartz has since given a more satisfactory account of Calea scoparia, and has referred it to Baccharis†; to which genus as Richard ‡ and Jussieu § have proposed to limit it, namely to the dioecious species of America, it unquestionably belongs. This limitation of Baccharis it may, upon the whole, be expedient to adopt; by doing so, however, a name of Dioscorides is applied to a genus of plants found only in the new continent; while, notwithstanding the contrary opinion is expressed by M. de Jussieu ||, sufficient distinctions exist between those species of Baccharis from which the Linnean character was taken, and Conyza when reduced to its original species, C. squarrosa and bifrons, and a few others since added to the genus: for these differ from Inula chiefly in the extreme shortness of their ligulae.

As no satisfactory character has hitherto been given of Baccharis, that will serve to distinguish it, as now limited, from the dioecious Gnaphalia, I propose the following.

† Flor. Ind. Occident. iii. p. 1339.
|| l. c.

Bac-
Baccharis.


Willdenow, in his edition of Species Plantarum, has retained the four Linnean species of Calea, and added to them an equal number, not one of which belongs to any of the genera formed by the original species, but to four others equally distinct.

The first of these additional species, taking them in the order in which Willdenow has arranged them, is Calea aspera, which he adopted from Jacquin; by whom it is well described and figured, though erroneously referred to Calea.

* I have observed another dioecious genus with naked receptacle, capillary pappus, and a habit nearly similar to that of Baccharis, of which Baccharis nereifolia Linn. is the only published species. It may be named

Brachylena.

This, and not (as M. Richard has supposed) the nearly related species of North America, is what Linneus originally intended by his *Bidens nivea*, as appears by the specimen in his Herbarium; by his original reference to Vaillant’s “Ceratocephalus foliis cordatis s. triangularibus flore albo*,” described from a specimen in Surian’s Herbarium; and by his afterwards adding as varieties of his species the two plants from Carolina figured in Hortus Elthamensis.

*Calen aspera* is abundantly distinct from *Bidens*, and has very little affinity with any of the original species of *Calea*, and least of all with *C. jamaicensis*, from which the character was taken. Since its appearance in Willdenow’s work, however, it has been continued in this genus, in most of the recent catalogues of Gardens, as those of Desfontaines, Decandolle, and the second edition of Mr. Aiton’s Hortus Kewensis; and Lamarck in his Illustrationes Generum has copied Jacquin’s figure of it, apparently as the principal example of the genus *Calea*.

It is certainly now too late to recur to the name of *Amellus*, under which Browne, as I have already attempted to prove, first proposed this plant as a distinct genus; Linneus having soon after given that generic name to two very different plants, to one of which it is still applied; and the real plant of Browne having till now been mistaken, owing in part to his having entirely overlooked the pappus which is deciduous.

*Bidens nivea*, however, as long ago as 1784 was described by Von Rohr, and published by him in 1792 in the second volume of the Transactions of the Natural History Society of Copenhagen, as a distinct genus, under the name of *Melanthera*; and in 1803 by Richard, in Michaux’s Flora Boreali-Americana, where it is called *Melananthera*, and where the two species included by Linneus

in his *Bidens nivea* are for the first time distinguished: and lastly this genus, as named and determined in the work of Michaux, is adopted by Persoon in his Synopsis.

But as both Von Rohr and Richard have given only the natural character of the genus, and the essential character proposed by Persoon is not altogether satisfactory, I have added the following, and adopted the more generally received name of

**Melananthera.**

(Richard) in Michaux Amer. ii. p. 106. Melanthera Von Rohr in Kio-

*Involucrum* duplici serie polyphyllum, subæquale. *Receptaculum*
paleaceum, convexum, paleis foliaceis. *Flosculi* tubulosi, uni-
formes, hermaphroditæ. *Achenium* turbinatum angulatum ver-
tice depressæ. *Pappus* e setis (2—18) scabris, distinctis, deciduis.

Herbæ (Americæ æquinoctialis et temperatæ) pubescentes, scabrae.

*Folia* opposita, indivisa v. sublobata. *Capitula* terminalia, pe-
dunculis unifloris, elongatis, ternatis, geminisæ. *Involucrum* foli-
aceum. *Receptaculi* hemispherici paleæ foliolis involucris subsi-
miles. *Corollæ* albidæ. *Antheræ* nigræcantes, appendicibus apicis
albidis, basi muticæ; paulo post expansionem corollæ exsertæ, dein
(contractione filamentorum) fauce inclusæ. *Stigmata* appendicis
acuto hispidulo, post retractionem tubi antherarum exserta; de-
mum subinclusa*.

OBS. In Von Rohr's natural character of *Melanthera* the Necta-
rium, or glandular body sheathing the base of the style, is intro-
duced,

* In the extensive collection of plants made by my lamented friend Dr. Smith, on the
banks of the Congo, I have observed a Syngenesious genus, which, though belonging to
Polygania superflua and having yellow flowers, is in other respects so nearly related to
*Melananthera*, that had it been found with ripe seeds only, it would certainly have been
referred
duced, which is the earliest notice I have yet found of this organ in Composite, except in Batsch’s Analysis Florum, published in 1790, where it is both described and figured in Coreopsis tripteris. The merit, however, of establishing its nearly universal existence in the hermaphrodite florets of this extensive class belongs to M. Cassini.

Both Von Rohr and Richard in their characters of Melananthera have described the antheræ as shorter than the corolla, which is indeed the case in a particular state of the flower; immediately after its expansion, however, they project considerably, and again become inclosed in the more advanced stage. This fact has been noticed by Jacquin*, who considers the final inclosure of the antheræ to be owing to the elongation of the corolla. But the actual increase in length of the corolla is very slight, and by no means sufficient to account for the appearance; the real cause of which is a considerable, and I believe a gradual, contraction of the filaments. This economy is not unfrequent referred to it. The following characters, however, prove it to be sufficiently distinct. It may be named

**Lipotrichè.**

**Involucrum** dupliqui serie imbricatum, subæqual. **Receptaculum** convexum, paleis foliaceis, distinctis. **Capitulum** radiatum. **Ligulae** (simplici serie) feminæ. **Flosculi** hermaphroditi, stigmatibus appendice acuto hispidulo. **Achenia** subuniformia, turbinata; **Pappus** setaceo, caduco.


* Collect. ii. p. 291. 1c. Rar. iii. t. 583.
in Compositae, especially in the tribe of Heliantheæ, to which Melananthera belongs.

In M. Cassini's Memoir on the Stamina of Compositæ the retraction of antheræ is not expressly noticed. This appearance, however, can hardly have escaped so accurate an observer; and his opinion respecting its cause may perhaps be inferred from an observation he has made on the stamina of the tribe in which it is most remarkable, namely Heliantheæ; whose filaments below the joint, he says, wither very soon after fecundation*. To this withering, which he does not mention as occurring in any other tribe, the phænomenon in question may be supposed to be ascribed.

But it appears to me, that the contraction or collapse of the filaments, from their previous state of extension, is a vital action, and not the effect of withering or decay, which, however, speedily follows it. For the contraction may in great part be prevented by the separation of the floret, when the filaments are in the state of extension: and in many genera of Compositæ the antheræ are never retracted, but continue to project till they fall off with the corolla.

This contraction is also analogous to the more evident motion or irritability of the filaments long ago noticed by Borelli and Alexander Camerarius† in certain Cinarocephale; and more fully described in the same tribe by Dal Covolo‡; whose observations are confirmed and extended to other subdivisions of Compositæ by Koelreuter§. A similar contraction and

* Journal de Physique, tome lxxviii. p. 278.
‡ Discorso della Irritabilita d'alcuni Fiori. Firenze 1764.
§ Von Einigen das Geschlecht der Planzen betreffenden versuchen. 3. fortsez. p. 125.
irritability of the style has been lately described by Mr. Ker in certain species of *Arctotis*.

The second species added to the genus by Willdenow is *Calea lobata*, which Linneus, from the general appearance, I conclude, rather than from actual examination of the plant in Clifford’s Herbarium, had referred to *Conyza*; and having no specimen in his own Herbarium, the twofold error of supposing it to belong to *Polygamia superflua*, and to have a naked receptacle, remained uncorrected in all his subsequent works.

Its real structure was first pointed out by Professor Swartz, who consequently referred it to *Calea*, with the character of which it exactly agrees. This alteration is adopted in the first edition of *Hortus Kewensis*, where the generic character of *Calea* is modified, to admit those species that are without pappus; and by Gaertner, who limits the genus to *C. lobata* and *C. jamaicensis*, as the only species that correspond with the Linnean character. But as *C. jamaicensis*, the original species of *Calea*, has been shown to have a pappus of a very different kind, it becomes necessary to give a new name to *Calea lobata*; and some additions being also wanting to its generic character, I propose the following, and the name of

**Neurolema.**

*Calea Gärт.*


*Botanical Register, i. 34.*


natural Family of Plants called Composite.

liola obtusa, nervosa. Paleæ receptaculi involuco subsimiles. Corollæ flæae*.

The third species, Calea pinifolia, is adopted from Forster's Flora Insularum Australium Prodromus.

The specimen of this plant in George Forster's Herbarium (now forming part of the extensive collection of Mr. Lambert) is very imperfect; it evidently, however, belongs to the same species with a more complete specimen received, without a name, from Forster by Sir Joseph Banks, in whose Herbarium I have examined it, and ascertained that it has a naked receptacle. It therefore cannot be a species of Calea, which I have no doubt Forster considered it merely from a certain degree of resemblance to his Calea leptophylla.

From the structure of its stigmata, antheræ, and involucrum, Calea pinifolia belongs, indeed, to a very different tribe, and might even be referred to Gnaphalium as it at present stands. But this extensive and ill defined genus evidently requires reformation;

* There are two other genera in many respects agreeing with the character here given of Neurolæna, which it is necessary to point out. The first is Carpophorus of M. Cassini (in Bulletin des Sciences 1816, p. 198), sufficiently distinct in having the stigmata of Eupatorium or Liatris with the habit of the latter, from some species of which it differs only in its receptacle having paleæ.

Piptocarpha.


Obs. I have not seen perfect seeds; and as even in the unripe state they fall off along with the inner squamæ of the involucrum, and the antheræ project in a remarkable degree, it is possible the plant here described may be only the male of a dioecious species: it certainly, however, belongs to a genus not before published.
and if the necessity for its subdivision be admitted, it will also, I believe, be found most expedient to apply the name *Gnaphalium* to that section to which *G. luteo-album*, *sylvaticum*, and *uliginosum* belong, and which is characterized by its naked receptacle, its involucrum connivent at top and of equal height with the truncated capitulum, which consists of numerous filiform female florets in the circumference, with a smaller number of hermaphrodite florets in the disk, both of them ripening seeds and having a sessile capillary deciduous pappus.

To *Gnaphalium* so limited *Calea pinifolia*, a shrub with nearly acerése leaves, and in which all or most of the flosculi are hermaphrodite and the radii of the persistent pappus somewhat thickened upwards, cannot be referred.

It seems, however, to approach more nearly to *Antennaria*, a genus separated from *Gnaphalium* by Gærtner, but which, as he has proposed it, consists of three tribes of plants sufficiently dissimilar in habit and structure to justify a further subdivision; and, what is remarkable, none of them entirely agreeing with his generic character.

The first tribe consists of herbaceous plants, natives of Europe and North America, having the male and female flosculi in distinct involucra and on different individuals. To this genus the name *Antennaria* may remain, though descriptive of the pappus

*Antennaria.*


natural Family of Plants called Compositae.

pappus of the male flower only. Its species are Gnaphalium dioicum Linn., alpinum L., carpaticum Wahlenberg, plantagineum L., and G. margaritaceum L.

The second tribe, consisting of Gnaphalium Leontopodium and

Obs. Gnaphalium margaritaceum, which I have referred to this genus, was first described by Clusius; from whose account it appears to have been introduced into the English gardens from America towards the end of the sixteenth century.

It has ever since been very generally cultivated, as an ornamental plant, both in this country and on the continent of Europe; and has a place in several of the European Floras, as well as in those of North America. It is surprising, therefore, that hitherto the male plant only should have been observed, uniformly, however, considered as hermaphrodite, except by M. Cassini, who in his first memoir on Synantheræ (in Journal de Physique, tome lxxvi. p. 200) suspects it to be male, from the imperfect appearance of the ovarium.

That this species of Gnaphalium is really dioecious, I learned several years ago from the inspection of a specimen of the female plant in the Herbarium of Sir Joseph Banks, who found it on the banks of the Rymney in Glamorganshire, where the plant was first observed by Lhwyd. I have since received several specimens of both sexes from Mr. Bicheno, to whom I had mentioned this fact, and who obligingly undertook to observe the different states of the plant in the same place, where it seems to be really indigenous. I have never been able to discover any female florets in the circumference of the capitulum of the male plant; but in the centre of the female capitulum I have always found two or three imperfect male florets, whose antheræ, although cohering and of the usual form, appear to be destitute of pollen.

The separation of sexes in a still more common plant of this class, namely, Serratula tinctoria, has been equally overlooked.

All the authors who have noticed this species, which is included in almost every European Flora, as well as in more than one recent Monograph of the genus, have considered it as hermaphrodite, while it really belongs to Polygama diaca, or has its perfect sexual organs on different plants. The hermaphrodite plant, apparently perfect, but which I believe very seldom ripens seed, is well figured by Schkuhr (in Botanisches Handbuch, tab. 234); and the female, whose stigmata are remarkably developed and undulated, while the antheræ are evidently imperfect, and which generally produces ripe seeds, is represented in English Botany (tab. 38), in Flora Danica (281), and probably also in Svensk Botanik (170). For my knowledge of this fact respecting Serratula tinctoria I am indebted to the Rev. Robert Bree of Camberwell, who pointed out to me both its states, which he was then disposed to consider as distinct species.
Mr. Brown's Observations on the

*Leontopodioides*, which may be called *Leontopodium*, is in affinity intermediate between *Antennaria* and *Gnaphalium* as here limited, but has sufficient characters to distinguish it from both.

The third tribe has been found only in South Africa, and consists of shrubs with small rigid heath-like leaves, of which the margins are incurved, the upper surface tomentose, and the under convex and nearly smooth; but by a remarkable twisting they are in most of the species resupinate; a character which seems to have been overlooked in all the described species; namely, *Gnaphalium muricatum*, *mucronatum*, and *seriphioides*. In this tribe, or genus, which may be named *Metalasia*, the involucrem is generally cylindrical, and in most of the species has a short radius formed by the spreading coloured laminae of the inner scales; the floesuli are few in number, and all hermaphrodite; and the radii of the pappus, which fall off separately, are either thickened or more strongly toothed at top.

*Calea pinifolia* does not even belong to this genus, though it has a nearly similar habit; but the margins of its leaves are revolute, and their tomentum chiefly on the under surface. In these respects, as well as in the principal characters of fructification, it agrees with several shrubs, chiefly of New Holland and Van Diemen's Island; among which are *Eupatorium ferrugineum*, *Eupatorium rosmarinifolium*, and *Chrysocoma cinerea* of M. Labillardiere. Part of these have the inner squamae of the involucrum simple, as seems to be the case in *Calea pinifolia*; while in others, as the two species referred to *Eupatorium* by M. Labillardiere, they form a short radius. These I am inclined to consider merely sections of one and the same genus, which may be distinguished by the following character, and named

*Ozothamnus*. 
The fourth species added to Calea by Willdenow is Calea leptophylla of Forster, whose specimens I have examined in Mr. Lambert's Herbarium. Amongst Forster's drawings, formerly referred to, there is a coloured figure of this plant, by which it appears that he originally considered it to belong to Gnaphalium. From this genus he afterwards removed it, probably on finding it referred to Calea in the collection of Sir Joseph Banks, by whom it was discovered in New Zealand in a more perfect, at least in a more luxuriant state.

This plant, though agreeing with Calea in every part of the Linnean essential character, differs remarkably from it in other points of nearly equal importance, as well as in habit; and along with Calea aculeata of M. Labillardiere, and several other species also natives of New Holland and Van Diemen's Island, constitutes a genus very nearly related to Ozothamnus, from which it is to be distinguished chiefly by the paleæ of its receptacle.

I propose
Mr. Brown's Observations on the

I propose to name this genus in honour of M. Henri Cassini, whose well conducted investigation of Compositae has already thrown much light on the structure and economy of the more important parts of fructification of this difficult class: and especially of those organs from which the distinguishing characters of Cassinia are here derived.

I shall add the characters of the species of this genus, which, like Ozothamnus, admits of subdivision into two sections; and I have appended to it Calea spectabilis of Labillardiere, a plant corresponding with it in character, but differing very much in habit from all the other species.

Cassinia.

Caleae sp. Labillardiere.


Frutices. Folia sparsa, saepius angustata, marginibus recurvis. Inflorescentia terminalis, corymbosa rariusve paniculata. Involucra alba nunc cinerea raro aurea; squamis intimis saepius apice conniventibus, nunc patulis et radium brevem obtusum efformantibus.

† Involucrum radiatum (squamis intimis apice patulis).

1. C. leptophylla, foliis lineari-lingulatis subter ramulisque inca-nis, corymbis terminalibus, involucris turbinatis.

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† † Involucrum connivens.

A. Fruticosæ.

2. C. denticulata, foliis ovalibus oblongis acutis spinulosodenticulatis subter tomentosis, corymbis compositis, involucris hemisphaericis.


3. C. longifolia, foliis lanceolato-linearis elongatis lœvibus subter tomentosis, corymbis decompositis, involucris turbinatis.

Loc. Nat. Novæ Hollandiæ ora orientalis prope Port Jackson; in dumetis. (v. v.)


Loc. Nat. Novæ Hollandiæ ora orientalis prope Port Jackson; in sylvis et dumetis. (v. v.)

5. C. aculeata, foliis angusto-linearis margine revolutis super hispidulis subter ramulisque incanis, corymbis compositis decompositisve congestis, involucris turbinatis.


Loc. Nat. Insula Van Diemen; in dumetis et ad ripas fluv. (v. v.)

6. C. affinis, foliis angustato-linearis margine revolutis super hispidulis
hispidulis subter concoloribus, corymbis decompositis congestis, involucris turbinatis.

**Loc. Nat.** Novæ Hollandiæ ora orientalis prope Port Jackson; in dumetis. *D. G. Caley.* (v. s.)

**Obs.** C. aculeatæ nimis affinis.


**Loc. Nat.** Novæ Hollandiæ ora orientalis prope Port Jackson; in dumetis. *D. G. Caley.* (v. s.)


**Loc. Nat.** Novæ Hollandiæ ora orientalis prope Port Jackson; in montosis. *D. G. Caley.* (v. s.)


**Loc. Nat.** Novæ Hollandiæ ora orientalis prope Port Jackson; in montosis. *D. G. Caley.* (v. s.)

†† B. *Herbacea.*

10. *C. spectabilis*, panicula decomposita, foliis lanceolatis decurrentibus subter ramisque lanatis.


**Loc. Nat.** Novæ Hollandiæ ora australis; in sylvis dumetisque prope Memory Cove, Port Lincoln, &c. legi. In Insula Van Diemen a D. Labillardiere detecta. (v. v.)

Since
Since the publication of Willdenow's Species Plantarum very few alterations have been made in the genus *Calea*.

In Persoon's Synopsis two of the species are excluded; namely, *Calea scoparia*, which, following Swartz, he has referred to *Baccharis*; and *Calea aspera*, adopted from Richard as a species of *Melananthera*. The additional species in the work referred to are *C. cordifolia* of Swartz, already noticed as a genuine *Calea*; *C. aculeata* and *spectabilis* of Labillardiere, which belong to *Cassinia*; and *C. cordata*, adopted from Loureiro, of whose plant nothing is known except from the short description in *Flora Cochinchinensis*, which is only sufficient to render it probable that it neither belongs to *Calea* as I have proposed to limit it, nor to any of the genera hitherto confounded with it.

M. Poiret, in the Supplement to the Botanical Dictionary of the Encyclopédie Méthodique, has under the article *Calea* retained all the species of this genus given by Persoon; and also *Calea aspera*; which, however, he has in a subsequent article correctly referred to *Melananthera*.

Connected with the proper subject of this paper, I shall describe and add some observations on a plant lately sent from Brazil by Mr. Sellow; which, though not strictly referable to Compositæ, probably belongs to a genus at present included in this family; and conclude with a few remarks on the structure and affinities of *Brunonia*.

I have named the Brazil plant

**Acicarpha spathulata.**

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Petiolis lineares basi parum dilatata semiamplexicauli; inferiores elongati; superiores plerumque folio aliquoties breviores. Capitula solitaria, nunc oppositifolia pedunculata, nunc terminalia subsessilia, basiflora, ovata, flav. Involucrum simplici serie pentaphyllum, capitulum floridum superans, foliaceum; foliolis inæqualibus spathulatis sessilibus integerrimis ipsa basi connatis. Receptaculum subulato-conicum, paleaceum. Paleae lanceatæ mucronulatæ, inter flosculos hermaphroditos-masculos magis manifestæ, inter hermaphroditos passim abortientes. Flosculi tubulosi, uniformes, glabri. Flosculi ambitús, duplici tricipitave serie, hermaphroditus, utroque organo perfecto. Corollæ Tubus gracilis cylindraceus, cum ovario continuus, basique stylo accretus, per lentem 10-striatus. Limbus infundibuliformis, 5-fidus, æstivatione valvata; laciniiis semilanceolatis, planis, trinerviis; nervis lateralibus margine parallelo-approximatis, indivisis, apice confluenceibus, e nervis alternis tubi infra sinus furcatis ortum ducentibus. Stamina 5 epipetalata, limbi laciniiis alternantia. Filamenta inferne cum tubo arcte connata, superne libera, fauci quasi inserta, invicem cohaerentia in tubulum 5-dentatum, ipsis apicibus, subito mutatione texturae, articulatis; basi intus incrassatum arcis 5 oblongis cum filamentorum axibus alternantibus. Antheræ continuæ, lineares, dimidia inferiore arcte cohaerentes, superiore libera; biloculares, loculis longitudinaliter dehiscentibus, valvula interiore angustiore, receptaculo pollinis utriusque loculi longitudinali septicormi: basi emarginatæ, lobulis posticis acutiusculis brevibus polliniferis; apice simplices connectivo ultra loculos haud producto. Pollen subglobosum, per lentem pluries augentem obsolete angulatum. Ovaria connata, singula coronata calyce 5-fido dentibus spinescentibus cum laciniiis limbi corollæ alternantibus; monosperma, ovulo
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ovulo ovato penduló, paulo infra apicem affixo funículo crassiusculo ex ipso apice angustato cavítatis orto; chorda vasculari a puncto insertionis ad extremitatem inferiorem ejusdem lateris attingenti. *Stylus* filiformis glaber, inferne cum basi tubi corolla conatus. *Stigma* simplex obtusum hispidum.

*Flosculi superiores* numerosi hermaphroditó-masculi, paulo minorès hermaphroditis, calycis laciniis submembranaceis; ovarii (pariter connati) imperfectis, spíius absque ovulo.

*Pericarpia* (flosculorum ambitús): *Achenia* conferruminata, singula coronata calycce aucto 5-spinoso, spinis patulis conico-subulatis e substantia suberosa axi solidiori rigida.


Notwithstanding the great difference between my account of this plant and that given by M. de Jussieu of his *Acicarpha tribuloides*, I have very little doubt that they both belong to the same genus; though from the above description it is evident that *Acicarpha spathulata* is not referable to Compositae. To this plant *Calycera* of Cavanilles, in the seeds of which M. Correa has found albumen, seems to be very nearly related; and a third genus, probably referable to this group, is *Boopis*, described by M. de Jussieu in the same Memoir with *Acicarpha*. The important characters, however, of the pendulous ovulum and inverted embryo remain to be ascertained in all these; and the presence of albumen in *Acicarpha tribuloides* (in *Acicarpha lanata* of Lagasca in Pers. Syn. ii. p. 488, if it really belong to this genus), and
in both species of Boopis. Another question respecting the latter genus is, whether its capitulum be simple, as it certainly is in Acicarpha spathulata; or compound, as Jussieu's figure of Boopis anthemoides seems to indicate.

In the mean time, with the necessary knowledge of structure of Acicarpha spathulata only, I shall venture to propose this group as a distinct natural family to be placed between Compositae and Dipsaceae; though upon the whole somewhat more nearly approaching to Compositae. This family, if my conjectures respecting Calycera and Boopis should be hereafter verified, may be called CALYCEREE; Acicarpha even as a generic name being barely tenable, provided the original species agrees with that here described: for on this supposition, M. de Jussieu has mistaken the laciniae of the perianthium for paleae of the receptacle, deriving the name of the genus from their form; and has entirely overlooked the real paleae, which, though they could not have suggested this name, may however sanction its being retained, if it be not still better to change it to Acicarpa.

It will be attended with similar advantage to form a separate family of

Brunonia,
as a link of equal importance, connecting Compositae with Goodenoviae, but from both of which it is in many respects very distinct. As I have formerly described this genus, and made several observations on its principal affinities*, I shall here only state the more important relations and distinctions between it and those families to which it appears to me most nearly to approach.

Brunonia agrees with Goodenoviae in the remarkable indusium of the stigma; in the structure and connexion of the antheræ; in

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the seed being erect; and essentially in the aestivation of corolla. It differs from them in having both calyx and corolla distinct from the ovarium; in the disposition of vessels in the corolla; in the filaments being jointed at top; in the seed being without albumen; and in its remarkable inflorescence, compatible, indeed, with the nature of the irregularity in the corolla of Goodeniææ, but which can hardly coexist with that characterizing Lobeliaceæ*.

With Compositæ it agrees essentially in inflorescence; in the aestivation of corolla; in the remarkable joint or change of texture in the apex of its filaments; and in the structure of the ovarium and seed. It differs from them in having ovarium liberum or superum; in the want of a glandular disk; in the immediately hypogynous insertion of the filaments; in the indusium of the stigma; and in the vascular structure of the corolla, whose tube has five nerves only, and these continued through the axes of the laciniae, either terminating simply (as is at least frequently the case in Brunonia sericea), or (as in B. australis) dividing at top into two recurrent branches forming lateral nerves, at first sight resembling those of Compositæ, but which hardly reach to the base of the laciniae.

It is a curious circumstance that Brunonia should so completely differ from Compositæ in the disposition of vessels of the corolla, while both orders agree in the no less remarkable structure of the jointed filament; a character which had been observed in a very few Compositæ † only before the publication of M. Cassini's second Dissertation, where it is proved to be nearly universal in the order.

In the opposite parietes of the ovarium of Brunonia two nerves or vascular cords are observable, which are continued into the style, where they become approximated and parallel. This struc-

* See Flinders's Voyage to Terra Australis, ii. p. 559.
† Batsch Anal. Flor. p. 107; et Schkuhr Handb. tab. 236 et 244.
ture, so nearly resembling that of Composite, seems to strengthen the analogical argument in favour of the hypothesis advanced in the present paper—of the compound nature of the pistillum in that order, and of its type in phaenogamous plants generally;—Brunonia having an obvious and near affinity to Goodenoviae, in the greater part of whose genera the ovarium has actually two cells with one or an indefinite number of ovula in each; while in a few genera of the same order, as Dampiera, Diaspasis, and certain species of Scævola, it is equally reduced to one cell and a single ovulum.

Sir James Smith, in establishing Brunonia as a genus, is disposed to refer it to Dipsacæa. To certain species of this order it, indeed, bears a striking resemblance in habit; it also very nearly agrees with them in its remarkable inflorescence; and one great objection to its union with them may be supposed to be removed in adopting M. Decandolle's account of their ovarium.

But as Brunonia differs from the whole order in the following characters, all of which are of primary importance;—namely, in the origin and æstivation of corolla; in the insertion and whole structure of stamina; in the indusium of the stigma; in the ovulum being inserted at the base of the cavity of the ovarium; in the erect embryo and want of albumen;—I continue to think that its proper place in the natural method is between Goodenoviae and Composite.

I shall conclude this subject, by proposing a few queries respecting the indusium of Brunonia and Goodenoviae.

Is this remarkable covering of the stigma in these families merely a process of the apex of the style? or is it a part of distinct origin, though intimately cohering with the pistillum? On the latter supposition, may it not be considered as analogous to the glandular disk surrounding or crowning the ovarium in many other
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other families? And, in adopting the hypothesis I have formerly advanced* respecting the nature of this disk in certain families,—namely, that it is composed of a series of modified stamina,—has not the part in question a considerable resemblance in apparent origin and division to the stamina of the nearly-related family Stylideae?

To render this supposition somewhat less paradoxical, let the comparison be made especially between the indusium of Brunonia and the imperfect antherae in the female flowers of Forstera. Lastly, connected with this view, it becomes of importance to ascertain whether the stamina in Stylideae are opposite to the segments of calyx or of corolla. The latter disposition would be in favour of the hypothesis. This, however, is a point which will not be very easily determined, the stamina being lateral. In the mean time, the existence and division of the corona faucis in Stylidium render it not altogether improbable that they are opposite to the segments of the corolla.

Since the preceding paper was submitted to the Society, M. Cassini has published † the substance of a Memoir, which he read to the Academy of Sciences of Paris in August last, on a new family of plants named by him Boopideae, and consisting of Calycera, Boopis, and Acicarpha. I have also, through the liberality of Messrs. de Jussieu, Desfontaines, and Baron Delessert, had the opportunity of examining specimens of Acicarpha tribuloides in flower and fruit, of both species of Boopis in flower, and detached flowers and pericarpia of Calycera. In all of these I have found the ovulum pendulous; and in Acicarpha and Calycera an inverted embryo occupying the axis of a fleshy albumen.

* Linn. Soc. Transact. x. p. 159.
† Bulletin des Sciences, 1816, p. 160.
My conjectures, therefore, on their structure and relation to *Aci-
carpha spathulata* of the preceding paper, are completely verified
by this examination, as well as by the observations of M. Cassini,
who with his usual acuteness has detected the principal charac-
ters distinguishing *Boopidea* from *Composite* and *Dipsacea*,
between which he has also placed them.

As M. Cassini's Memoir, though read subsequently to mine, is
already published, the name *Calycere*, which I have proposed
for this family, is superseded by that which he has given it.

But as his account of the order is by no means complete, seve-
ral characters of considerable, though not primary, importance
being entirely omitted, I may be allowed to add to my paper
some remarks on the more essential points of resemblance and
difference between it and the two families to which it is most
nearly related.

The principal characters distinguishing *Boopidea* from the
whole of *Composite* are the pendulous ovulum and the albumen
inclosing the embryo, of which the radicle points to the apex of
the pericarpium. It appears to me necessary to state all these
characters, and nearly in the terms in which they are here given:
for, 1st, A pendulous ovulum most frequently, indeed, is not,
however, invariably connected with *radicula supera*, though that
direction of radicle might here, as well as in *Composite*, with con-
fidence have been inferred from the vascular structure of the ovu-
*Some of the indications in many cases afforded by the structure of the unimpregnated
ovulum, of the position and direction of the parts of the future embryo, have hitherto been
 overlooked: the subject, however, for its elucidation requires details incompatible with the
limits of the present communication. I have in another place (Flinders's Voyage to Terra
Australis, ii. p. 601.) thrown out a similar hint, which has probably attracted no attention,
and must reserve the explanation of both for a separate essay.*

2dly, Where the insertion of the ovulum is, as in this fa-
mily, evidently below the upper extremity, the radicle which

points
points to this extremity cannot in strict propriety be described as directed towards the umbilicus. M. Cassini has not noticed the direction of the radicle; either from supposing it constantly connected with that of the ovulum, or, which is more probable, from not having ascertained it.

These distinctive characters may be considered as fully sufficient to authorize the separation of Boopideæ from Compositæ; yet the same differences exist between certain genera referred and really belonging to Rubiaceæ and the principal part of that order.

There are, however, three other characters unnoticed by M. Cassini, which distinguish the flowers of Boopideæ from the hermaphrodite flowers of the whole of Compositæ; namely, the accretion of the base of the style with the tube of the corolla; the absence of the epigynous disk or nectarium; and the longitudinal subdivision of each cell of the anthera by a "receptaculum pollinis," as in most other families, and of which, indeed, there seems to be the rudiment in the syngenesious genus Petrobium, described in the preceding paper.

In the partial cohesion of the antheræ, in which they resemble Jasione, they certainly differ from all known Compositæ; but as in certain Compositæ the antheræ are very slightly connected or entirely distinct;—this, though a remarkable circumstance, can hardly be employed as a distinguishing character.

The principal characters in which Boopideæ differ from the greater part, though not from the whole of Compositæ, are the corolla being continuous, or not jointed, with the ovarium; the antheræ having no membranaceous appendix at top; and the undivided stigma.

Boopideæ differ from Dipsaceæ in the vascular structure and valvular aestivation of corolla; in the aestivation, insertion, and connexion...
Mr. Brown's Observations on the

nexion of antheræ; in the absence of the partial involucrum; and in having alternate leaves.

In adopting M. Decandolle's description of Dipsaceæ*, they would differ also in the important character of "ovarium inferum." This distinction, however, is neither universal, nor I believe absolute in any case.

M. Auguste Saint Hilaire in his excellent Memoir on Primulaceæ†, while he admits the correctness of M. Decandolle's account with respect to great part of Dipsaceæ, has at the same time well observed, that in several species of Scabiosa the ovarium is entirely united with the tube of the calyx. But neither of these authors has remarked the curious, and I believe peculiar, circumstance, of the base of the style cohering with the narrow apex of the tube of the calyx, even in those species of the order in which the dilated part of the tube is entirely distinct from the ovarium.

This kind of partial cohesion between pistillum and calyx is directly opposite to what usually takes place, namely, the base of the ovarium being coherent, while its upper part is distinct. It equally, however, determines the apparent origin or insertion of corolla and stamina, producing the unexpected combination of "flos superus" with "ovarium liberum."

In the vascular structure of the corolla Boopideæ may be considered as essentially agreeing with Compositæ, in many of whose genera the middle nerves of the tube and segments are equally manifest. In stating the character derived from this source in either of these orders, it is not sufficient to describe the nerves of the laciniae only as M. Mirbel has done in his character of Compositæ‡, and M. Cassini in that of Boopideæ: but it is also necce-

‡ Elemens de Physiol. Veget. et de Botan. ii. p. 885.
sary to give their disposition in the tube or undivided part of the limb; there being instances in both families where the lateral nerves of the segments do not unite at top; and, as has been formerly remarked, several examples in other families of a nearly similar disposition in the segments, accompanied by a different disposition in the tube. To the examples of this kind formerly given, *Globularia cordifolia* may be added, in the segments of whose lower lip there are three simple nerves, of which the lateral do not unite at top, and continue distinct nearly to the base of the tube, where they converge and appear to unite with the middle nerve.

In *Acicarpha* and *Boopis* the filaments appear to me jointed as in Compositae; a character I have not been able to observe in the very few flowers which I have examined of *Calycera*.

In *Acicarpha* the florets of the circumference are hermaphro-dite and apparently complete, the antherae containing pollen and the ovaria producing seed; while those of the disk are male with an incomplete pistillum. Such an arrangement has not hitherto been observed in Compositae, in which, wherever the central florets are male with an imperfect pistillum, those of the circumference are female with or without the rudiments of stamina.

The regularity in the order of expansion of flowers from the base to the top of the capitulum in *Acicarpha tribuloides* and *spathulata*, and the irregularity, approaching to the inverted order, which I have found to exist in both species of *Boopis*, seem to prove the capitulum to be simple in the former genus and compound in the latter, notwithstanding the great resemblance between their involucra. The exact nature of its composition, however, in *Boopis* can only be satisfactorily determined in recent specimens.
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This irregular expansion in *Boopis*, which renders even the generic name improper, and at present the want of satisfactory characters to distinguish it from *Calycera*, are objections to the name M. Cassini has chosen for this family; while that of *Calycereae*, which I have proposed, derived from the genus first described, and applicable to all the genera of the order, appears to me unexceptionable: especially as there seems no reason to doubt that the part which I have considered as calyx in *Boopideae* is really such; its divisions being generally in equal number, and alternating with those of the corolla. It may be observed that a like alternation of the divisions of the pappus with the segments of the corolla obtains in those genera of *Compositeae* where both parts are in equal number. But in some cases, where the division of pappus is still further reduced, the same alternation does not exist, especially in those genera having vertically compressed pericarpia and two aristae, as *Spilanthis* and *Salmea*.

The absence of "discus epigynus" in *Boopideae* is a necessary consequence of the accretion of the base of the style with the tube of the corolla. It seems to me, however, that a modification of the same organ may be traced in the five thickened areolæ observable within and near the base of the tube formed by the filaments in *Acicarpa spathulata*; and much more distinctly in the same situation in *Boopis balsamitifolia*, where they have the appearance of five adnate fleshy bodies alternating with the filaments.

This apparent decomposition of the glandular disk in *Boopideae*, compared with its state in *Compositeae*, as well as its transposition and the alternation of its parts with the stamina, seem to give some additional support to the conjecture I have formerly hazarded in the paper on *Proteaceae*, published in the Society’s Transactions (vol. x. p. 159); namely, that in several families—for the hypothesis
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hypothesis not meant to be extended to all—this part, even in its simplest state, may be considered as formed of a series of modified stamina: Or, merely to state the facts from which the conjecture originates, that there are certain families in some of whose genera this organ exists in its simplest form, that of an undivided fleshy ring; while in other genera of the same families it consists of several distinct bodies alternating with the stamina, and in some cases putting on the appearance of barren filaments.

This hypothesis is chiefly applicable to families in which the number of stamina is equal to the divisions of one floral envelope only, the nectarium being supposed to be formed of the second series: but it receives its principal support from Scitamineae*, where the glandular bodies belong actually to the same series with the perfect stamen.

I am aware at the same time of several objections to its generalization. Thus, the nectarium or glandular disk exists in families where, though the stamina are definite, they are equal in number to the divisions of calyx and corolla united; and moreover, in such families where it consists of distinct parts, these parts are placed where an addition to the number of stamina is least likely to take place, as in Crassulaceae. Here, however, as in many other cases, the divisions of the disk are opposite to the ovaria; they may therefore be supposed more intimately connected with the pistilla than with the stamina; an opinion which is I believe held, though not yet published, by the ingenious M. Decandolle with respect to Ranunculaceae. In support of this opinion it may be noticed that in Paxonia Moutan, where the disk or urceolus is in the state of the greatest development, when a multiplication of the pistilla takes place, which in the double-flowered varieties of this

* See Flinders's Voyage to Terra Australis, ii. p. 574.
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species it not unfrequently does by the addition of one or more inner series, the rudiments of an analogous disk are produced along with each of the additional series.

Yet, in opposition to this view, I have in a single instance found one of the divisions of the urceolus in *Paonia Moutan* changed into an anthera; and the divisions of the apparently analogous organ in *Aquilegia*, which in their usual state resemble barren filaments, have sometimes been observed with perfect antherae.

* Schkuhr Handbuch, tab. 146.

Read March 5, 1816.

The principal part of the following paper was read to the Society in March 1813. It was then withdrawn with a view of rendering it more perfect by additional facts, which I hoped I might be able to collect. Since that time I have not had it in my power to pay much attention to the subject. As, however, the facts formerly stated appear to me of some importance, and are as yet unpublished, I take the liberty of again submitting them to the Society, along with a few additional instances of anomalies in the structure of seeds and fruits, hardly less remarkable than those contained in the original essay.

It is, I believe, generally admitted by physiological botanists, that the seeds of plants are never produced absolutely naked:—in other words, that the integument through some point or process of which impregnation takes place, cannot properly be considered as part of the seed itself.

That such a covering, distinct from the seed, really exists, may in most, perhaps in all, cases be satisfactorily shown by a careful examination of the unimpregnated ovarium, to a part only of whose cavity the ovulum will be found to be attached.

There are, however, many cases where soon after fecundation, and more remarkably still in the ripe fruit, this integument acquires
quires so complete and intimate a cohesion with the proper coat of the seed as to be no longer either separable or distinguishable from it.

But systematic botanists have generally agreed to term a naked seed not only this kind of fruit, but every monospermous pericarpium bearing a general resemblance to a seed, and whose outer covering, though distinct from the nucleus, is only ruptured after germination commences.

For the purposes of an artificial arrangement this language may perhaps be sufficiently accurate; but in determining the affinities of plants, it is necessary to express by appropriate terms those differences which are no less important than real.

Of the fruits improperly called naked seeds, there are two principal kinds: The first, in which the pericarpium is distinct from the seed, is termed Akena by Richard in his excellent Analyse du Fruit; the second, in which the pericarpium coheres with the seed, is the Caryopsis of the same author.

An Akena (or Achenium), even in a separate state, may in general be readily determined. But it is not always equally easy to distinguish a Caryopsis from a seed. It may indeed be done in certain cases, as in Grasses, by attending to its surface, in which two distinct and distant cicatrices are observable; the one indicating the point of attachment to the parent plant, the other that by which it was fecundated. In certain other tribes, however, this criterion cannot be had recourse to, the surface of the Caryopsis exhibiting but one areola or cicatrix, which includes the closely approximated points of attachment and impregnation: in such cases, the true nature of the fruit can only be determined by its examination in an earlier stage.

But although it must be admitted that an ovulum is never produced without a covering, through some part of which it is impreg-
impregnated; it is still possible to conceive a case in which a ripe seed may be considered as truly naked while retaining its attachment to the parent plant; and this not subsequent to germination, but even preceding the formation of the embryo. For if we suppose, as the immediate effect of impregnation, a swelling of the ovulum without a corresponding enlargement of the ovarium, the consequence will obviously be a premature rupture of the ovarium, and the production of a seed provided with its proper integuments only.

I am not aware that such an economy has hitherto been described; I have observed it, however, in several plants belonging to very different families, and of essentially different structures.

The first of these is Leontice thalictroides of Linneus, Caulophyllum thalictroides of Michaux, who has founded his new genus on a difference of fruit, the nature of which he has entirely misunderstood. It is remarkable that its real structure should have escaped so accurate an observer as M. Richard, through whose hands it is generally understood Michaux's work passed previous to its publication; but the fact may at least serve to show how entirely unexpected such an economy must have been even to that excellent carpologist.

My observations were made in the summer of 1812, on a plant of Leontice thalictroides, which flowered and ripened fruit in the royal gardens at Kew. An examination of the unimpregnated ovarium proved it to be in every respect of the same structure with that of the other species of Leontice; and essentially the same with the whole order of Berberides, to which this genus belongs. A careful inspection of the fruit, in different states, proved also that the "Drupa stipitata" of Michaux is in reality a naked seed, that in a very early stage had burst its pericarpium,
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the withered remains of which were in most cases visible at the base of the ripe seed. The first error of Michaux naturally led to a series of mistakes; and the naked seed being considered by him as a drupa, the albumen, which is of a horny texture, is described as a "nux cornea crassissima," and the embryo itself as the seed.

But although this account of the fruit of Leontice thalictroides be in no respect similar to that given by Michaux, it may perhaps be considered by some as still differing sufficiently from Leontice to authorize the establishment of a distinct genus; and that, therefore, the name Caulophyllum may be retained, and its character derived from the remarkable circumstance described, namely, the early rupture of its pericarpium. I believe, however, it will be found more expedient to reduce it again to Leontice.

For, in the first place, its habit is entirely that of the original species of the genus. And secondly, though the pericarpium of Leontice Leontopetalum, which is the type of the genus, remains shut until the ripening of the seeds, and attains a size more than sufficient for the mere purpose of containing them; yet in Leontice altaica, a species in other respects more nearly approaching to L. Leontopetalum than to L. thalictroides, the pericarpium, though it enlarges considerably after impregnation, is ruptured by the seeds long before they have arrived at maturity.

The accompanying drawing, for which I am indebted to my friend Mr. Ferdinand Bauer, will materially assist in explaining the singular economy now described; and may also perhaps render more intelligible the account I proceed to give of the second instance in which I have observed an analogous structure, but to illustrate which I have at present no drawing prepared.

This
This second instance occurs in *Peliosanthes Teta* of Andrews's Repository and the Botanical Magazine:

In this monocotyledonous plant, which in 1812 nearly ripened seed in Mr. Lambert's collection at Boyton, the ovarium coheres with the tube of the perianthium or corolla, and has originally three cells, each containing two ovula. Soon after impregnation has taken place, from one to three of these ovula rapidly increase in size, by their pressure prevent the development of the others, and rupture the ovarium, which remains, but little enlarged at the base of the fruit, consisting of from one to three naked berry-like seeds.

In the Botanical Magazine Mr. Ker, in describing a second species of *Peliosanthes*\(^*\), takes the opportunity of altering in some respects the character of the genus he had previously given, and of adding a description of its supposed pericarpium, from an inspection, as it seems, of the unripe fruit of *Peliosanthes Teta*. It is evident, however, that he is not aware of its real structure; and consequently does not succeed in reconciling its appearance with the unquestionable fact of its having "germen inferum."

There are some cases in which this early opening of the ovarium, instead of being, as in the preceding instances, an irregular bursting, apparently caused by the pressure of the enlarged ovula, is a regular dehiscence in the direction of the suture. Of this *Sterculia platanifolia* and *S. colorata* are remarkable examples; their folliculi after opening, which takes place long before the maturity of the seeds, acquiring the form and texture of leaves, to whose thickened margins the ovula continue firmly attached until they ripen. Another example of this early and regular dehiscence occurs in an undescribed genus of the same family, which differs from *Sterculia platanifolia* in its pericarpium having a terminal wing and a single seed.

\(^*\) Botan. Magaz. 1532.
In the specimens of a plant lately sent from Brazil by Mr. Sel- low, I observe a similar economy. In this case the ovarium, which is originally unilocular with five parietal placentæ, soon after fecundation opens regularly into five equal foliaceous valves, to the inner surface of each of which an indefinite number of ovula are attached.

The genus Reseda, whose capsule opens at top at a very early period, may be considered as affording another instance, though much less remarkable, of the same anomaly. And it is possible this may be the real structure in certain cases of which a very different view has been taken.

In the instances of naked seeds now given, the bursting of the pericarpium precedes the distinct formation of the embryo, while the proper coats of the seed remain entire till after its separation from the parent plant, and germination has commenced.

It may not be uninteresting to contrast this economy with that of the Mangroves and other plants of tropical countries, which grow on the shores, and within the influence of the tide. In many of these the embryo, long before the seed loses its original attachment, acquires a very considerable size; and the first effect of this unusual development is the rupture, in most cases succeeded by the complete absorption or disappearance, of the proper integument of the seed. In some instances the development proceeds still further, and the pericarpium itself is perforated by the embryo, which, while preserving its connexion with the parent plant, often attains the length of from eighteen inches to two feet. This happens in Rhizophora and Bruguiera, or the Mangroves properly so called. In some of the spurious Mangroves, as Avicennia and Aegiceras, a lesser degree of development takes place, and in general their pericarpia remain entire till they have dropped from the tree. In both cases the final cause of the economy is suffi- ciently
ciently evident; a greater than ordinary evolution of the embryo being necessary to ensure its vegetation in the unfavourable circumstances in which it is unavoidably placed.

But an analogous structure exists in other plants, where the final cause is less apparent, as in certain species of Eugenia, in which the integument of the seed is completely absorbed before its separation from the parent plant, and while the pericarpium remains entire.

An economy no less remarkable than that of the Mangroves, but of a nature diametrically opposite, takes place in the bulb-like seeds of certain liliaceous plants, especially of Pancratium, Crinum and Amaryllis; in some of whose species the seed separates from the plant, and even from the pericarpium, before the embryo becomes visible. This observation respecting some of these seeds was, I believe, first made by Mr. Salisbury; and in such as I have myself examined, I have found the fact connected with one no less interesting, namely, an unusual vascularity in the fleshy substance.

I have in another place*, in speaking of this substance, which constitutes the mass of the seed, and in a central cavity of which the future embryo is formed, stated it to be destitute of vessels, and entirely composed of cellular texture. But on a more careful inspection, of those seeds at least in which the separation precedes the visible formation of the embryo, I now find very distinct spiral vessels:—these enter at the umbilicus, ramify in a regular manner in the substance of the fleshy mass, and appear to have a certain relation to the central cavity where the embryo is afterwards formed, and which, filled with a glairy fluid, is distinctly visible before the separation of the seed. It is a curious consequence of this tardy evolution of the embryo, which in some cases does not

become visible unless the seed be placed in a situation favourable to germination, that very different directions may be given to its radicular extremity, according to circumstances which we have it in our power to regulate.

There is a fourth kind of anomaly in the structure of certain seeds, which, as I have formerly described it*, I shall here notice in few words. It is that which takes place in certain Aroideae, especially in some species of Calladium. In these, the nucleus of the seed is not properly a monocotyledonous embryo, but has an appearance and economy more nearly resembling those of the tuber of a root; for, instead of being distinguishable into a cotyledon, a plumula and radicula, and of germinating in a determinate manner and from a single point, it is composed of a mass whose internal structure is uniform, and on the surface of which frequently more than one germinating point is observable.

None of these anomalies appear to me materially to lessen the importance of the characters derived from the seeds of plants; but they evidently render a minute attention to every circumstance absolutely necessary in all attempts either to deduce affinities or establish genera from this source; and they especially demonstrate the necessity of carefully ascertaining the state of the unimpregnated ovarium; for, while its structure remains unknown, that of the ripe fruit can never be thoroughly understood.

EXPLANATION OF PLATE VII.

A.—A branch of the panicle of *Leontice thalictroides* Linn. (*Caulophyllum thalictroides* Michaux), of the natural size.

B.—The same magnified, to show at 1, the early rupture of the ovarium, the ovula as yet but little enlarged and only in part protruded: at 2, the same parts in a more advanced state; one seed being nearly ripe, supported by its elongated and thickened umbilical cord; a second ovulum considerably increased in size, but abortive; and the remains of the ruptured ovarium somewhat enlarged.

C and D.—Two longitudinal sections of the nearly ripe seed; exhibiting the vascular cord continued from the axis of the funiculus umbilicalis to the apex of the seed; the remarkable process of the inner integument at the umbilicus (of which another view is given separately at E); and the unripe embryo nearly in contact with this process, and as yet undivided.
XIII. Remarks on two Genera of Plants to be referred to the Family of the Rosaceæ, in a Letter from Mr. A. P. De Candolle, Professor of Natural History in the Academy of Geneva, Corresp. R. Acad. Sc. Paris, &c. to Sir James Edward Smith, President of the Linnean Society.

Read April 2, 1816.

Monsieur,

Si les descriptions des espèces nouvelles sont les acquisitions les plus évidentes de la botanique, les rectifications des descriptions anciennes ne laissent pas d'avoir aussi quelqu'intérêt : elles en acquièrent surtout lorsqu'elles sont relatives à des plantes que leur beauté a rendues populaires, et lorsqu'elles ont pour résultats de faire classer avec quelque précision des objets connus auparavant ; ce sont ces motifs qui m'engagent à vous faire part de quelques observations sur le Corchorus japonicus de Thunberg, et le Tigarea bidentata de Pursh ; je vous en dois l'hommage à d'autant plus juste titre que vous avez déjà étudié le même sujet, et que c'est à la complaisance avec laquelle vous avez bien voulu me permettre d'étudier l'herbier de Linné, que je dois d'avoir pu éclaircir une partie importante des difficultés qui m'arrêtoient.

Occupé depuis plusieurs années de quelques recherches sur les fleurs doubles, j'avais analysé avec soin le Corchorus japonicus de nos jardins, et je m'étais assuré, 1. que dans cette plante les pétales naturels et les pétales accessoires qui représentent les étamines sont
sont insérés non sur le réceptacle comme dans les vrais *Corchorus*, mais sur le calice même; 2. que l'ovaire n'y est pas unique comme dans les *Corchorus*, mais composé de 5 à 6 ovaires distincts; 3. que le mode de végétation et d'inflorescence de ce prétendu *Corchorus* diffère beaucoup des autres espèces de ce genre: j'avais conclu de ces observations que le joli sous-arbrisseau cultivé dans nos jardins sous le nom de *Corchorus japonicus* n'appartient ni au genre ni à la famille où il a été placé, mais qu'il fait partie de la famille des *Rosacées*.

Depuis lors j'ai eu, graces à vous, Monsieur, l'occasion de voir ce prétendu *Corchorus* à fleurs simples, et je me suis assuré que les soupçons déduits de l'analyse des fleurs doubles étoient fondés, et que cette opinion, quoique en apparence nouvelle aujourd'hui, se trouve déjà consignée dans plusieurs livres.

Vous avez déjà fait connoître par une note de l'excellente monographie des *Rubus* que vous avez insérée dans la *Cyclopædia* du Dr. Rees, que le *Rubus japonicus* de Linné n'est autre chose que notre *Corchorus*; Linné dit que les fleurs en sont blanches, et cette circonstance a sans doute éloigné les botanistes de toute recherche à cet égard; mais l'échantillon de l'herbier de Linné que vous avez bien voulu me permettre d'étudier, montre des pétales pales et décolorés il est vrai, mais qui ont pu être jaunes; il est probable que Linné, entrainé par le sentiment et le tact exquis qu'il avait sur les rapports naturels, a cru qu'une plante si voisine des *Rubus* et des *Spiraea* devoit avoir la fleur blanche; cet échantillon avec celui de Thunberg ne m'a laissé comme à vous aucun doute sur l'identité des deux plantes, et sur la sagacité avec laquelle Linné l'avait rapportée à sa famille; en voyant même les rapports de foliation des *Rubus corchorifolius*, *elongatus*, *pyrifolius*, *acuminatus*, &c. avec celle de notre plante, on conçoit facilement comment sur un échantillon sec elle a pu être rapportée à ce genre.
Le savant et respectable Président de la Société Royale, qui, comme on sçait, a fait une attention particulière à la botanique du Japon, m'a fait remarquer lorsque j'ai eu l'honneur de lui parler de cet objet, que les Japonois paroissent avoir senti le rapport de leur plante avec les Rosacées, car ils donnent au Pyrus japonica le nom de Buke, et au prétendu Corchorus celui de Jamma Buki. Kämpfer dit même en décrivant cette plante, "flores simplici luteo Ranunculi, Rosae caninae facie ac magnitudine;" depuis l'époque de Thunberg les premiers doutes sur la légitimité de sa classification se trouvent consignés dans le Botanist's Repository; la figure représente très bien la position perigyne des étamines et le nombre des ovaires; on lit de plus dans la description; all the flowers that we have seen are from 5- to 8-gynous; which with the singular form of the capsule makes us consider it as a very doubtful species of Corchorus.

S'il est facile d'affirmer que le Corchorus de Thunberg n'est point de ce genre, et qu'il appartient, comme Linné l'a pensé, à la famille des Rosacées, il l'est un peu moins de décider sa place dans cette famille; il ne peut être un Rubus, parceque ses fruits ne paroissent nullement destinés à devenir charnus, et que d'ailleurs son port et la couleur même de sa fleur s'y opposent trop fortement; il paroît avoir plus de rapports avec les Spirées; mais il s'en éloigne encore par l'unité des graines de chaqu'ovaire et par cette même couleur de la fleur; je crois donc que cette plante doit former un genre nouveau; j'aurois voulu pouvoir faire hommage de cette espèce élégante, et qui devient tous les jours plus populaire au botaniste qui m'a donné l'occasion de m'assurer de ses caractères, et qui a tant contribué à populariser la botanique en Angleterre: mais votre nom étant déjà consacré dans la science des fleurs, j'ai donné à ce nouveau genre le nom de Kerria, d'après celui de William Kerr, jardinié, qui d'après le témoignage de M. Robert

Il est un autre végétal rapporté par le seul botaniste qui l’a décrit à une famille très différente de celle-ci, et qu’on doit selon moi non seulement rapporter à la famille des Rosacées, mais placer très près du Kerria; je veux parler du Tigarea tridentata de Pursh; dès l’inspection de la figure et de la description, j’avais pensé que cette plante n’était point un Tigarea*, n’appartenait point aux Dilleniaceées dont le Tigarea fait partie, et devoir être reporté dans les Rosacées auprès des Spiræa. M. Lambert, qui a bien voulu me permettre d’étudier les richesses de sa belle collection, m’a donné l’occasion de changer ce soupçon en certitude; je puis donc d’après l’examen de l’échantillon même de Pursh affirmer que sa plante est un genre de Rosacée, que je désignerai sous le nom de Purshia, en l’honneur du botaniste qui l’a le premier fait connaître, aussi bien qu’un grand nombre de plantes de l’Amérique septentrionale.

Le Kerria et le Purshia ont entre’eux des rapports très intimes; l’un et l’autre sont des sous-arbrisseaux de pays tempérés et analogues†; munis de bourgeons écailleux, et dépourvus d’épines et d’aiguillons; leurs feuilles sont simples, alternes, dentées, rapprochées sur de petits rameaux latéraux; leurs fleurs naissent le plus souvent solitaires, et pedonculées au sommet de ces petits rameaux; elles sont composées de 5 pétales jaunes arrondis, attachés au calice, et d’un grand nombre d’étamines perigynes; leurs ovaires

* Le Tigarea d’Aublet est lui-même un genre qui a été supprimé et réuni au Tetracera par Willdenow.

† Les botanistes savent qu’il existe un grand nombre de genres, et même de ceux qui sont composés d’un petit nombre d’espèces, qui ont une partie de leurs espèces dans l’Amérique septentrionale, et l’autre dans l’Asie orientale: tels sont les genres Magnolia, Illicium, Cimicifuga, Panax, Platanus, Thuja, &c. &c.
ne renferment qu'une seule graine, et leur fruit n'est pas charnu : ces deux genres se placent donc assez-bien entre la tribu des Spireées et celle des Dryadées.

Malgré l'intimité que ces deux genres présentent dans l'ensemble de leurs caractères, et la possibilité qu'on soit un jour forcé de les réunir, j'ai cru qu'il étoit plus convenable de les considérer comme distincts ; leurs différences, quoique légères, me paraissent suffisantes pour autoriser cette séparation : 1. Le Kerria a toujours de 5 à 8 ovaires au moins ; le Purshia n'en a qu'un d'après Pursh. M. Robert Brown y a vu 2 ovaires dans une fleur qu'il a analysée ; je n'en ai vu qu'un dans celle que j'ai observée ; ainsi le nombre, quoiqu'un peu vague, est fort inférieur à celui du Kerria. 2. La graine du Kerria est attachée latéralement vers le milieu de l'ovaire ; celle du Purshia est attachée à sa base. 3. Les styles du Kerria à fleur simple sont longs, filiformes, bien distincts des ovaires, tandis que celui du Purshia est court, et semble n'être qu'une simple sommité d'ovaire retrecie et atténuee ; oserai-je même ajouter que les ovaires sont glabres, peut-être indehiscens dans le Kerria, velus et susceptibles d'une légère dehiscence dans le Purshia; que le Kerria a des stipules axillaires très distinctes, tandis que celles du Purshia manquent; ou que du moins, si elles existent, elles y sont très petites et à peine perceptibles?

D'après ces considérations, je crois pouvoir établir les caractères de ces deux genres, comme suit :

**Kerria.**


**Car.** Calyx 5-fidus, lobis ovatis, 3 obtusis, 2 apice calloso-submucronatis, aestivatione imbricatis : Petala 5 orbiculata calyci inserta, ejusdem lobis alterna : Stamina circiter 20 filiformia calyci inserta : antherae ovatae : Ovaria 5-8 libera glabra globosa, ovulo
to be referred to the Family of the Rosaceae.

ovulo unico lateraliter adhaerente foeta: styli totidem filiformes. Capsulae (ex Thunb.) globosae.

**VeG.** Suffrutex inermis ramosus cortice laevi virescente, ramulis lateralibus brevibus è gemma squammosa ortis, floribus in ramulis sæpius solitariis pedunculatis; folia ovato-lanceolata acuminata penninervia grossè dentata, dentibus serratis serraturis acutis subaristatis, Spiræae opulifoliiæ nervatione et vernatione similia: stipulæ 2 lineari-subulate rigidiusculæ: flores lutei facillimè pleni, staminibus in petala oblonga obtusa basi angustata substipitata mutatis, ovariiis elongatis effatis sed sæpius persistentibus nec omnino evanidis.

*Kerria Japonica.*


Hab. in Japonia circa Nagasaki et alibi. *Thunb. 7 (v. v. c. fl. pleno. v. s. c. fl. simpl. in herb. Smith.)*

**Purshia.**

*Tigareæ Sp. Pursh.*


*VeG. Frutex ramosissimus inermis, cortice cinereo, ramulis lateralibus brevibus è gemma squammosa ortis: folia in ramulis conferta basi cuneata apice grossè bidentata supra villosa subtus cano-tomentosa: stipulæ nullæ aut minimæ: flores pænè lutei.*

*purshia*
Hab. in pascuis secus flumen Columbia in America boreali.
*Lewis.* v. s. s. in h. Lamb.)

Je désire, Monsieur, que ces observations puissent vous offrir quelqu’intérêt, et en publiant cette note prise en grande partie dans votre Herbier et dans ceux des autres botanistes de l’Angleterre, je m’estime heureux d’avoir une occasion de les remercier publiquement, ainsi que vous, de l’accueil obligeant par lequel ils ont bien voulu faciliter mes recherches.

J’ai l’honneur d’être, Monsieur, avec la considération la plus distinguée, votre très humble et devoué serviteur,

A. P. de Candolle.
XIV. *A Synopsis of the British Species of Rosa.* By Joseph Woods, Esq. F.L.S.

*Read April 16 and June 4, 1816.*

The beauty of the Rose is so trite a theme, that it would be almost impossible to praise it in any other terms than have already been used for the same subject:—but beautiful as it is, the genus has long been involved in confusion and obscurity. Born with the same senses, the same tastes as other men, the botanist will feel its beauties even more strongly than they do, in proportion as those tastes and senses have been more exercised towards similar objects. But the difficulties attending the investigation of these plants are at least equal to the charms of their appearance and fragrance: even their commonness has perhaps contributed to our ignorance of them. Educated with Roses always before our eyes, it is long ere we learn to consider them as objects of science; and the excitement of novelty is lost while we are yet incapable of accurate examination. For my own part, if I had not been stimulated by the strikingly different appearance of the genus in the hedges of Westmoreland from that which it assumes in the southern counties, I should probably never have exposed my insufficiency in this attempt to discriminate the species: but the almost uniformly villous leaves and the colour of the flowers, generally either a white (sometimes almost pure, sometimes with a spot or two of full red), or else a much deeper red than in any of the Roses in the neighbourhood of London, attracted my attention,
tion, and urged my endeavours to find fixed and distinct characters, to distinguish plants marked by such differences in the general appearance. Though I feel that I have little reason to congratulate myself on the success of these attempts, and have indeed been successively obliged to relinquish many of the characters on which that general difference of appearance depends, yet I venture to offer their imperfect results to the notice of the Linnaean Society. In an obscure or intricate subject, the faithful record of observations is always valuable.

With views no more exalted, it may be considered as inconsistent to attempt a Synopsis of the British Roses; but in fact I did not perceive any other mode in which the remarks I had collected could be so well arranged; and the attempt once made, I exerted myself to give some consistency and value to the essay, by putting in systematic order the materials within my reach. That it is still imperfect I am aware; but I flatter myself it will not be found useless by the future investigator of this most interesting genus.

It appears to me that the principle to be attended to in the subdivision of genera, is to keep together those species which are most nearly allied in nature. In the formation of the genera themselves, it may be necessary to attend exclusively to the organs of fructification, as the most important parts of the plant; but in their sections we must find a character in any part which will keep similar plants together. With all this latitude of choice, the accomplishment of the object will be found often of very difficult attainment; and after all our labours, the best arrangement which can be made may still present some important aberrations.

On examining by this general rule the usual division of the genus *Rosa* into those "fructibus ovatis" and "fructibus subglobo-
sis,“ the following observations will sufficiently show that it is extremely defective. The existence of prickles, or rather of setæ, on the fruit or on the peduncle, will not serve for this purpose much better, though these characters have hitherto been much insisted on;—the setæ on the peduncle are, I believe, more constant than those on the fruit, but they are by no means implicitly to be depended on.

I have no intention, as I have no means, to enter in this essay on any examination of foreign Roses; but in endeavouring to form an arrangement of the British plants, it became necessary to pay some attention to the general appearances, and to the more striking characters of the foreign species. If the whole genus were spread out before a botanist, he would separate them, according to the habit or general appearance of the plants, into several leading divisions; but in proceeding to distinguish each of these families in description, he will feel the want of some precise language to discriminate certain peculiarities not yet sufficiently attended to. Indeed, in analysing the differences among any tribe of plants more minutely than has been done before, we shall probably find it necessary either to adopt new terms, or to use with more precision some to which a more lax or more general interpretation has been affixed. This privilege I have ventured to assume in a few instances, where it seemed to me indispensable; and particularly with respect to the arms (arma of Linneus) of the Roses, which have hitherto been called by the general term aculei, except in a few instances, where weak pedicellated glands have supplied their place; and this latter appearance has been designated by the word hispid. Something of the necessity of more accurate distinctions seems to have been felt by Sir J. E. Smith in his account of the genus Rosa in Rees’s Cyclopædia, by
his having used the words aculeatus, setosus, and hispidus, as applied to the fruit and peduncle; but he extends the difference no further, and has given no explanation of the particular meaning he attaches to these terms.

Roses are furnished with aculei, setae, glands, hairs, chaff, and pubescence. Aculei or prickles are sometimes hooked, and generally more or less curved; but in some species they are quite straight. They have an expanded oblong base, and occur on the stems, petioles and nerves of the leaves, and perhaps in one or two instances on the fruit and fruit-stalk; at least one variety of *R. spinosissima* is either furnished with aculei, or with setae so strong that they are very liable to be mistaken for aculei.

Aculei are either straight, as in *R. spinosissima*; straightish, with a very slight curve downwards, as in *R. villosa*; falcate, or bent as a scythe, as in the large prickles of *R. gracilis*, and in some varieties of *R. tomentosa*; and hooked or uncinate, like a claw or sickle, as in *R. canina*. Those of *R. arvensis* and of some neighbouring species are frequently a sort of obtuse elliptical cone, with a straight or curved mucro. This peculiarity of form is not found in *R. systyla*, and is nowhere sufficiently constant to enter into the character of any species. In the descriptions of the species, the form of the aculei must be taken from those which grow on the strong parts of the plant, and from those which are largest and with the most extended base.

Setae are always straight, and tipped with a gland; this gland sometimes falls off, but vestiges of it can generally be perceived. Setae are always smaller than aculei occupying the same situation; that is, the setae of the stem are smaller than the aculei of the stem; the setae of the petioles are smaller than the aculei of the petioles; but the setae of the stem are often larger than the aculei
aculei of the petioles. Setæ are found on the same parts as the aculei, and are besides frequent on the peduncle and fruit, and sometimes on the leaflets of the calyx: they differ, in being longer or shorter in proportion to the size of the gland by which they are terminated.

The glands of Roses are almost always on little footstalks, which however being weak, and seldom of length greater than the diameter of the gland, may in general be distinctly separated from the setæ above mentioned.

Glands rarely occur on the stems; but they are found on the stipulæ, which are frequently fringed with them; on the petioles and nerves; in some Roses on the under, and in some also on the upper side of the leaf, and sometimes on the edges, tipping the serratures, or giving the appearance of secondary ones; on the fruitstalk, receptacle, and calyx. The latter part is not unfrequently furnished with setæ at the base, which, gradually diminishing in length and strength, pass insensibly into glands towards the termination of the phyllus. To these glands the odour of the leaves of Roses seems to be invariably owing. They are generally most abundant on the early and imperfectly-formed leaflets, and sometimes fall off or dry up towards autumn.

Some Roses are furnished with only one sort of these arms, others have two, others again all three. In some, one sort is confined to one or two parts of the plant, as the setæ of R. villosa; in others it occurs generally, as the setæ of R. rubella. Some species, as Rosa Eglanteria, proceed by almost insensible gradations in one part or other of the plant from hooked to straight prickles, to setæ, and to glands; others again, though furnished with all these, display them perfectly distinct. In some the aculei, though always distinct from setæ, vary very much in size and character;
in others, though somewhat different on different parts of the plant, yet on any given part they are nearly similar. Some further observations on this head will be found in the description of the surculi.

Some Roses in the place of setæ exhibit white hairs, weak, but not very fine: in *R. Borreri* the peduncle has sometimes weak setæ, sometimes these white hairs, and sometimes, though more rarely, a fine pubescence; hairs also occur on the upper side of the axillæ of the foliace, and occasionally also along the channel on the upper side of the petiole in most Roses; and sometimes the petioles and the nerves on the underside of the leaf are covered rather with hairs than with down; but from this point the hairiness passes insensibly into pubescence, with which it is even interchangeable. On the upper side of the leaf likewise a few straggling along the nerves may occasionally be observed in all the smooth-leaved Roses; the seeds also and the styles are generally hairy or villous. The weak white hairs occur in every part of the plant on which glands or setæ are found, being a production apparently of a similar nature.

Chaff may be observed occupying the place of hairs at the axillæ of the folioles of *R. spinosissima* and some others of that tribe. I have not observed it elsewhere.

Pubescence is found on the stems, receptacles, calyces, stipulae, and folioles. The presence or absence of hirsuties, whether of coarse or fine hairs, on the petiole and on the veins beneath the leaf, appears to me of considerable importance, and it is observable that these always accompany each other. Individual leaves may doubtless be found in which the petiole is downy and the nerve naked, or perhaps sometimes just the reverse; but a more extended examination will assuredly demonstrate their connexion. To the pubescence of the inferior and superior paginae of the leaf attention.
attention must be paid, although the former perhaps always in some degree accompanies the hirsuties of the footstalk. On the stem, peduncle and fruit, pubescence is too rarely exhibited in British Roses for me to form any estimate of its value. On the other hand, *R. arvensis* is the only British Rose of which the styles are smooth, and the seeds in all of them are villous. The white hairs which occupy the place of glands are always more or less interchangeable with them; the hairs on the axillae of the leaflets, and those which are occasionally to be met with along the upper surface of the midrib, are I believe common to all Roses, and can therefore be of no use in distinguishing the species. The chaffiness is only met with in one tribe, where it is somewhat uncertain, and which is besides characterized by much more important distinctions.

The appropriate name for the hip of a Rose during the inflorescence has been long a subject of contention among botanists; a circumstance which may be considered as a proof of the insufficiency of the Linnean terminology in this respect. Linnaeus himself called it the *germen*. Sir J. E. Smith, aware of the impropriety of this term, drew all his specific characters of this part from the fruit, not adverting to its appearance in an earlier stage: in the detailed description he still preserves the word *germen*. Willdenow continues the use of this word, although he censures Linnaeus for adopting it. Jussieu and Gaertner call it simply *calyx*, describing the genus as having *calyx urceolaris*. The French botanists call it the *tube of the calyx*: but, according to general apprehension, the *calyx* would consist merely of those five leaves which form the outer envelope of the flower; and even after a strict attention to botanical terms, a student would be apt to conclude the fleshy body separated by its substance, and apparently by
by its functions, from the five small leaves, to be a *germen*, till the circumstance which alone distinguishes it—the small orifice through which the styles pass—is pointed out to him. Under these circumstances I have ventured to call the part in question a *receptacle*, understanding by this term the thickened substance occurring between the summit of the peduncle and the leaves of the calyx in the natural order of *Rosaceae*, supporting not only the latter, but also the stamina and petals, and confining it to the period of inflorescence:—the outer covering of the flower I have therefore exclusively called *calyx*, and its divisions *lacinia* instead of *lacinia*.

The only objection to this arrangement arises from that part of a strawberry and of one or two other genera, which has usually been called *receptacle*. Considering this term as only applied to the edible part of the strawberry, Gärtner says that the Rose has no receptacle: the difference, however, seems to me only this, that the inner series of vessels in the receptacle is dilated into a spongy body; in *Fragaria* soft and juicy; in *Comarum* harsh and dry; while in *Rosa* and *Potentilla* no such expansion takes place. If this be a correct view of the subject, the fruit of the strawberry ought not to be considered as the true receptacle, but as a spongy body attached to the receptacle and immediately supporting the seeds.

In calling the calyx simple, sub-simple, or compound, I have perhaps taken a less excusable liberty with the common language of botany;—by *simple*, I mean to express that the *lacinia* are undivided or without any offsets. These offsets of a *lacinia* when they occur have the appearance of a proliferous growth, which renders the term *offset* particularly applicable; and the term would perhaps be better than that of *pinnae*, which I have adopted, if
Mr. Woods on the British Species of Rosa.

if it were as usual. In a regularly-formed calyx they are always very narrow at the point of junction, and go off at a considerable angle; and when they take their commencement from a wide base, or lie nearly parallel to the line of the leaf, when the flower is open, the calyx must be rejected as a monster. On this subject some further observations will be found in the course of this introduction. This character (of a simple calyx), like all others in the genus, must be determined with caution; as even in some of those Roses whose calyx is generally simple, a small offset may sometimes be observed, even putting monstrosities out of the question. Another circumstance to be attended to is, that the proper offset or pinna always occurs before the contraction of the calyx leaf at the point of the flower; after that contraction many Roses have a strong tendency to produce more or less of a leaf.

The five leaves of the calyx of a Rose, united before the expansion of the flowers, present five lines of junction, each of which in the compound calyx is furnished with a row of offsets; two of the leaves having pinnae on each side, one on one side only, and the remaining two are uniformly entire.

"Quinque sumus fratres, sub eodem tempore nati,
Bini barbati, bini sine crine creati,
Quintus habet barbam sed tantum dimidiatam."

This arrangement I express by the term compound: in the sub-simple calyx every flower offers one or more of these offsets, but the whole provision is never found in any one.

In all Roses these calyx leaves are liable to become monstrous two ways: sometimes one or two, or sometimes even the whole number will grow out into leaves (folia), and sometimes the offsets are entirely wanting even in species where they usually are the
the most numerous. In the first case the divisions mostly take place after the contraction of the leaflet, which in the bud marks the termination of the petals; or if it occur in the lower and broader part, it carries the appearance of a division not of an offset, being wide at the base and contracted upwards; whereas the legitimate offset is uniformly contracted at the base and expanded upwards, except in the few instances where it is capillary. In the second case the receptacle is generally small, and the leaves are expanded towards the apex. In both the receptacle is but little contracted at the summit, and assumes somewhat of a turbinated form; but the best security for the student will be to examine many examples, and to judge by comparison of their proper form.

Another word, which perhaps may require some explanation,—rather, however, from a peculiarity in the mode of growth in this genus than from any singularity in the use of the term,—is SUCCULUS. In many roses, perhaps in some degree in all, two appearances may be observed; and, if I may be allowed the expression, every species under different circumstances has two distinct habits. A seedling Rose of the family of *R. canina*, for instance, where this property is very remarkable, usually comes up a small and feeble plant; it soon puts forth branches, weak like the parent from which they sprung. The aculei are few, small, weak, and but slightly hooked; the flowers pale and solitary; or, if in a favourable soil, two or even three flowers may be seen together; and the plant for several years probably will not exceed the height of four or five feet. If in this state it be cut down, a strong shoot proceeds from the root or from the base of the stem, which in one year will rise eight or ten feet in height, armed with abundance of strong hooked prickles, whose base is nearly equal to their length;
length; and bearing in the following summer bunches of six or eight flowers; or in *Rosa surculosa*, which affords an excellent example of these modes of growth, perhaps even of twenty-four flowers. In *R. arvensis*, and still more in some foreign species of that tribe, these shoots frequently bear cymes in the same year in which they are produced; consisting in *R. arvensis* of fifteen or sixteen flowers; in *R. indica* of twenty or thirty; in *R. moschata*, as I am informed by my friend Mr. Borrer, who has taken the trouble to count them, sometimes as many as two hundred and sixty-five. As branches are yearly produced from these surculi, their strength diminishes, and the original character of the plant returns till new root-shoots make their appearance. These are produced when the plant is partially destroyed; nor do I know that they ever occur except in consequence of some injury to the original growth. They do not indeed always vary to the extent I have described; but they constantly differ in this manner from the other parts of the plant, though not in equal degree.

In the Latin descriptions no ambiguity can possibly occur from the use of the term "foliolum," as applied to the parts of the calyx and those of the leaf. In the English observations I have endeavoured to avoid confusion, by calling the first *leaflet* and the latter *leaflet*, a distinction I did not adopt till I felt the want of it. The shape of the leaflet is taken principally from the terminal one, which I consider as the most perfect; all those of the earlier leaves are uncertain in their shape, always rounder than the others, sometimes retuse: these are to be rejected, and the shape of the leaflet deduced from those expanded later in the season.

The stipulæ of all British Roses are linear-decurrent on the petiole of the leaf, and generally edged with glands; in some species.
species these continue unchanged, or nearly so, in those leaves which accompany the inflorescence, and no stipulæ are found unaccompanied by leaves; in others the leaflets gradually diminish in number, till at last they are entirely deficient, and the two stipulæ unite and form a bractea; in others, again, before this process is complete, the stipulæ increase very remarkably in breadth, and the first bractea formed is perhaps subrotund, though arising from an alteration of strictly linear stipulæ; but in the cymes of flowers the bracteæ are repeated, growing gradually smaller and somewhat narrower; still, however, retaining traces of their original increase in width. The description of the bracteæ is therefore taken from the usual form of the first, which are found entirely devoid of leaflets; and the circumstance affords a very good distinction between two tribes of Roses, the family of R. cinnamomea possessing them in a remarkable degree, which I therefore describe as bracteatae; and those of the family of R. spinosissima preserving the stipulæ nearly unaltered, which I have therefore called ebracteatae.

This appropriation of terms is not the only liberty for which I have to apologize in this essay. I must acknowledge that I have described plants as species, of which I can hardly say that I really believe them to be distinct; but when this is the case, it is because I did not know with what species to join them. In enumerating them as species, I hope likewise to provoke the attention necessary to rectify the error; while, if placed as varieties, they would have less chance of being attended to. Another circumstance in which I have deviated from the usual practice of British botanists, though in this I am supported by the authority of Willdenow, is, that I have given names to many of the most remarkable varieties; and this practice has been adopted
adopted on the same principle of exciting the attention of other observers.

The drawing out into a table the specific characters of a genus possesses a double advantage; it brings them to a test, by which the writer will inevitably discover if unfortunately some of his specific characters should be drawn up without including any peculiarities to separate it from others, a fault of which even good botanical works afford too many examples; and it is of great assistance to the future investigator, as it leads him step by step to the species which is the object of his examination. But in order to accomplish this end, it is necessary that the characters which are most important and most permanent should occupy the first places: it is desirable that the arrangement of the table should of itself divide the genus into its most natural families. To combine these advantages is no easy task. To discover characters which shall be permanent, always capable of clear description and determination, and which at the same time shall uniformly bring together the most similar plants, and separate those comparatively dissimilar, is perhaps beyond the power of the human mind. Mr. Brown's arrangement of Proteaceae, in the tenth volume of the Society's Transactions, is an excellent specimen of what may be done in this way. Lamarck and De Candolle in their analysis of the genus Rosa in the Flore Française, have proceeded on a similar notion, though they have adopted a much inferior form, and seem to have had no higher ambition than to assist in some degree the investigation of the species. Even in this they have effected very little; because in taking first the colour of the flower, then the shape of the fruit, and then the prickliness of the peduncle, they have adopted for their leading divisions characters which are very variable. The yellow-
yellow-flowered Roses are perhaps constant in their colour; but this is by no means the case with the other species. The globular fruit in some divisions of the genus appears to be important; in others it is extremely uncertain. If the bristly fruitstalks are ever of any value, it can only be when they are used very cautiously to separate one or two allied species in particular subdivisions.

The characters which appear to me most constant in this genus are the presence or absence of setae on the stems; the prickles straight or hooked, equal or unequal; the tendency towards the formation of the upper stipules without leaves, or at least with leaves of fewer folioles, and expanding into bracteae. Next to these are the simple or compound form of the leaflets of the calyx, and the simple or compound serratures of the leaves. In the latter subdivisions I have made use of the shape and flatness or hollowness of the leaflets; and sometimes, though unwillingly, I have been obliged to depend on the pubescence, not finding any other describable character to discriminate plants whose difference of habit seemed to announce the necessity of separation.

This arrangement is not without its disadvantages, principally on account of the deciduous nature of the setae in two, or perhaps in three, families of the genus. Of these, however, *R. cinnamomea* is the only British plant; and a moderate attention to the description will easily teach the difference between this plant and *Rosa villosa*, the only species with which a specimen devoid of setae is in danger of being confounded.

ROSA.
Mr. Woods on the British Species of Rosa.

ROSA.

Character Genericus.


Observation.

I have already explained the reasons which have determined me to consider the young fruit of the Rose as a receptacle. In the abortive attempts to produce flowers, which so frequently occur in Rosa sulphurea, this part is flat as in Potentilla. In R. turbinata and a Rose called R. caroliniana in the gardens about London, it is cup-shaped; and sometimes even in our single English Roses a tendency to this form may be observed, but never without being accompanied by other circumstances of monstrosity.

In addition to the above characters, it may be observed, that all British Roses have weak stems furnished with prickles; pinnate leaves with serrated leaflets; and linear stipulae generally furnished with glands on the edges, decurrent on the petiole of the leaf.
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**SYNOPSIS SPECIERUM.**

**A. Setigerae (aculeis sæpius rectis)**
1. bracteata, setis deciduis cinnamomea.
2. subbracteatae, setis persistentibus
   a. serraturis simplicibus
      a. fructu suburceolato, aculeis paucis subaequalibus rubella.
      b. fructu globoso, aculeis confertis valde inaequalibus spinosissima.
   b. serraturis serrulatis
      a. foliis supra glabris involuta.
      b. foliis utrinque hirsutis
         * lacinii calycinis integris Doniana.
         † aculeis rectis gracilis.
         ‡ aculeis falcatis Sabini.

**B. Setis nullis, aculeis rectiusculis**
1. calycibus simplicibus villosa.
2. calycibus subsimplicibus
   a. bracteis ellipticis scabriuscula.
   b. bracteis lanceolatis heterophylla.
3. calycibus compositis
   a. serraturis serrulatis
      a. petalis margine crenatis pulchella.
      b. petalis margine integris tomentosa.
   b. serraturis simplicibus nuda.

**C. Setis nullis, aculeis uncinatis**
1. stylis distinctis
   a. serraturis serratis
      a. foliolis hirsutis
         * pagina tota inferiore glandulosa Eglanteria.
         † aculeis confertis, surculorum inaequalibus micrantha.
         ‡ aculeis sparsis, surculorum subaequalibus
tussilago.
   b. serraturis serrulatis
      * pagina tota inferior glabra
         † bracteis fructum superantibus bractescens.
         ‡ bracteis fructu brevioribus dumetorum.
   b. foliolis glabris
      * pagina superiore glabra
         † aculeis subaequalibus collina.
         ‡ aculeis inaequalibus hibernica.
   b. serraturis simplicibus
      a. foliolis subtilis venulis hirsutis
         * pagina superiore hirsuta
            † bracteis fructum superantibus bractescens.
            ‡ bracteis fructu brevioribus dumetorum.
      b. foliolis utrinque glabris
         * aculeis petiolorum falcatis canina.
         † aculeis petiolorum uncinatis surculosa.

2. stylis unitis
   a. surculis suberectis; aculeis confertis systyla.
   b. surculis decumbentibus; aculeis sparsi arvensis.

1. ROSA
Mr. Woods on the British Species of Rosa.

I. Rosa Cinnamomea.

R. bracteata, receptaculis globosis, calycibus simplicibus, caulibus setigeris, foliolis lanceolato-oblongis simpliciter serratis.


R. cinnamomea of Roth’s Fl. Germ. i. p. 217, and ii. 554, appears to be R. lutea bicolor. The above description was taken from a garden specimen (with single flowers), for which I am indebted to my friend Mr. Borrer. On comparison we found it to agree exactly with the figure and description of English Botany. Willdenow quotes R. fluvialis Fl. Dan. t. 868, as a variety of this plant; but this appears to me very doubtful. R. colliniola Ehr., R. majalis Hermann., and R. facundissima of some German writers, are usually, and I believe rightly, considered as synonyms of this species; but I have not had sufficient opportunity of investigation to decide upon the subject: and Roth describes R. facundissima with hooked prickles; which certainly causes considerable doubt. Perhaps, too, we must place here R. fraxinifolia of Gmelin, Fl. Bad. Alsat. ii. 413.

The long leaflets with simple serratures would alone be sufficient
Mr. Woods on the British Species of Rosa.

ufficient to distinguish this from every other British Rose; indeed it belongs to a family of which we have no other example in these islands, distinguished principally by setose stems, straight prickles, globose germens, entire calyx leaflets, lanceolate or oblong leaflets, and large distinct bracteae. The setae and even the aculei are very apt to be deficient on the upper part of the plant; and in this intricate genus it is necessary to examine the whole plant, and even many individuals of the species wherever it is possible. In all parts of the plant the setae are apt to fall off entirely; but the little papillae, to which they were originally attached, are in general observable. This family includes R. Banksiae and R. blanda, and perhaps we may unite with it R. parviflora, R. nitida, R. lucida, R. gemella, R. Lyonii, R. setigera, R. caroliniana, and R. caucasia, of the catalogue in Rees's Cyclopædia, to which I refer, as the work of a botanist of the highest authority, and as the most complete list of the genus hitherto published. I must, however, take this opportunity to declare that my knowledge of the foreign Roses is exceedingly slight and confined; and that in this attempt to mark the subdivisions of the genus, I have drawn my notions of the plants almost entirely from the characters given in the above-mentioned work. The object of these enumerations is to make my ideas intelligible respecting the natural affinities of the several species. In all this tribe the setæ are deciduous, and the aculei few and nearly equal, never passing by almost insensible gradations into setae, as they do in Rosa spinosissima, R. involuta, &c. 

This plant having hitherto been observed only in one place in these islands, I have no British varieties to enumerate. In countries where it is plentiful it varies very much in appearance, if we may judge from the different names it has received, and the discordant opinions as to what ought to be included in it as varieties.
Mr. Woods on the British Species of *Rosa*.

2. *Rosa rubella.*

*R. ebracteata,* caulibus setigeris, receptaculis suburceolaribus, serraturis foliolorum simplicibus, aculeis perpaucis gracilimis subaequalibus.


Mr. Winch finds this species on the sands of the sea-shore in Northumberland, mixed with *R. spinosissima:* it is also said to have been brought from Scotland. The ripe fruit I have never seen.

The resemblance of *R. rubella* to *R. spinosissima* may perhaps have occasioned it to have been so long overlooked; though the stems and branches covered with setæ, intermixed with a very few slender aculei, sufficiently distinguish it. The simple serratures of the leaflets will not suffer it to be confounded with *R. involuta* or *R. Doniana.*

The specimen of *R. pimpinellifolia* in the Linnaean Herbarium considerably resembles this species; but it is not sufficiently perfect to enable me to pronounce with confidence: I have therefore preserved the name given to it in English Botany. Perhaps some other authors may also have intended this plant by *R. pimpinellifolia;* but I have not been able to unravel their synonyms from those of *R. spinosissima.*

*Vol. xii.* 2 A *Rosa*
Rosa rubella is an interesting species, as it is so exactly between the families of R. alpina and R. spinosissima, that it might almost indifferently be referred to one or the other. The aculei are few and frequently wanting, as in the former tribe; the setae, though not uniformly deciduous, are yet very apt to fall off; and the fruit, though not properly urceolate, is distinguished from that of R. spinosissima and its affinities by a very evident neck. Of the family of R. alpina we have no British Rose; it includes besides that species R. pendulina, R. lagenaria, and R. pyrenaica.

Mr. E. Forster has a plant raised from seeds which were sent from Ireland for R. hibernica, and which, if not a distinct species, must be referred to R. rubella. The receptacle during the inflorescence is very long, and the leaves of the calyx are furnished with small offsets. The prickles are extremely slender, and more curved than is usual in the tribe, and the leaflets are narrower than their general form in this and the following species. There is a specimen closely resembling it in the Banksian Herbarium, where it is referred to R. pimpinellifolia, and marked Hort. Pitcairn. 1781.

3. Rosa spinosissima.

R. ebracteata, caulibus setigeris, receptaculis globosis, serraturis foliorum simplicibus, aculeis confertis valde inaequalibus.


R. pumila spinosissima, foliis pimpinellae glabris flore albo. Roi Synop. 455.

Frutex erectus, in apricis bipedalis, quandoque in umbrosis multo elatior. Rami breves, interne fuscì, aculeis reclinatis vel horizontaliter patentibus, rectissulis, confertis, valde inaequalibus, tandem in setas immutatis, muniti. Petioli nunc glabri, sepius glandulosi, interdum aculeis rectis instructi, acerosi, rarius pilosi. Stipulae lineares, glanduloso-serrate, glabrae, equeales. Folium 7-11, foliolum impar, et paria duo superiora reliquis majora, inflorescentiam versus subpauciora, simpliciter serrata, hic illie serratura
Mr. Woods on the British Species of Rosa.

ratura minore, plerumque glabra, interdum pilis raris ad nervum instructa, saturate
crividia, nitoris expertia, subtus pallidiora. Pedunculi solitarii, superne incrassati,
glabri. Receptaculum globosum, glabrum. Calycis foliola triangulari-lanceolata,
acuminata, simplicia, petalis breviora. Flores planiusculi, petala alba, basi lute-
centia, rarius pallide rubescencia, vel venis rubescensibus, vel alba gemmâ rubellî.
Styli inclusi; stigmatibus planiusculis. Fructus glaber, globosus vel depressus, ni-
tidus, atro-purpureus, demum niger, interdum etiam maturus, sanguineus.

In borders of fields and bushy places in a gravelly or sandy soil;
frequently abundant on sand-hills by the sea-shore.

In old specimens growing in barren and exposed situations, the
branches are occasionally destitute of prickles. The flowers are
sometimes red, and sometimes with veins of that colour. I have
a specimen of the latter variety, gathered near Cartmell in Lancas-
shire, with elliptical acute foliolo. In the R. ciphiana of Sibbald
they are variegated with red and white.

"The ripe fruit is in some countries preserved, and brought to
table in that state. In its natural state it is every where eaten by
children. It has a grateful sub-acid taste. The juice of it di-
luted with water, dyes silk and muslin of a peach-colour; and
with the addition of alum, of a deep violet: but it has very little
effect on woollen or linen." With. ii. 465.

β. Fruit-stalk rough, with pedunculated glands. The flowers are
sometimes very large.

R. pimpinellifolia a. Lam. et Dec. Fl. Fr. iv. 438. Sussex,
Mr. Borrer.

γ. aculeatissima. Fruit very large; peduncles and fruit sometimes
smooth, sometimes armed with aculei rather than setae: both appearances may be seen on the same plant: the fruit
is generally attenuated at the base. Sussex, Mr. Borrer.


δ. pusilla. Peduncle very short; fruit large, depressed, almost
buried among the leaves. Ireland, Mr. Sabine.

2 A 2

û. Pe-
Peduncle setose; fruit somewhat ampulliform, dark. Found by Mr. Robertson near Newcastle. I have never seen any specimen; it may perhaps be a dark-fruited variety of R. rubella.

R. spinosissima may be easily distinguished from R. involuta by its simple serratures. The only other British plant with which it could be confounded is R. rubella; but in R. spinosissima the aculei are numerous, strong, and expanded at the base, and gradually diminish into setae, those of an intermediate size being as numerous as those which are larger or smaller. In R. rubella the prickles are few, very slender, little expanded at the base, and nearly of a size; while the setae are much more numerous and crowded than in R. spinosissima: the setae of the peduncle also in R. rubella are long and slender; whereas the peduncle of R. spinosissima is either naked as in α, or with the glands on short peduncles as in β, or with arms, which are rather aculei than setae, as in γ. But perhaps the existence of such variations in this species ought to induce us to place but little dependence on this character. Both the colour and shape of the fruit of R. spinosissima vary considerably; but it is probably never either so red or so long as in R. rubella.

R. myriacantha, Lam. et Dec. Fl. Fr. iv. 459, & vi. 533, appears to be allied to R. spinosissima; but the footstalk and the under surface of the leaves are covered with glands. Lamarck and Decandolle also mention that there is a difference in the serratures of the leaves and in the leaves of the calyx, but they do not point out in what it consists. Desvaux, Journal de Botan. ii. 118, says the serratures of R. myriacantha are compound; but in a specimen of this species from Decandolle, in the Herbarium of Mr. D. Turner, they are simple.

I am by no means confident that the figure in the Fl. Danica, t. 398, is intended for this plant: it differs in the aculei, which are
are represented as all equal; and being variously bent, look
rather like hairs than prickles: their length, however, gives them
a different appearance from those of *R. rubella*, and I have never
observed smooth fruitstalks on that species. In all the Roses of
the *Flora Danica* there is an unnatural curvature and laxity of
habit, which was probably introduced by the artist from the notion that it would render them more beautiful as drawings.

No small degree of confusion has arisen between the names of
*R. spinosissima* and *R. pimpinellifolia*, originating apparently with
Linnaeus himself. In the *Flora Lapponica* he says of *R. sylvestris
pomifera minor*, which has usually been considered the same as
*R. spinosissima*, "In desertis passim prope tuguria vel fluviorum
ripas obvia fuit, licet nullibi copiose." In the *Flora Suecica* he
describes a species under that name, with a reference to the *Sp.
Plant.*, but not to the *Flora Lapp.*, and says of it, "Habitat ad
agrorum margines, eorumque acervos passim." Again, in the
*Fruticetum Suecicum* (A mem. Acad. v. 220,) he writes, "Per totam
Sueciam crescit, praecipue in acervos lapidum et ad agrorum mar-
gines, adeoque in sabuletis et montibus." In the second edition
of the *Sp. Plant.* i. 703, *R. pimpinellifolia* is first introduced, "ger-
minibus globosis, caule aculeis sparsis;" and it is added, "Habitat
forte in Europa:" but no synonyms are given. In the same edi-
tion *R. spinosissima* is described "germinibus ovatis glabris, pe-
dunculis caule petiolisque aculeatissimis;" and in the *Syst. Veg.
edit. 13*, the character "germinibus globosis" is equally given to
both.

Sir J. E. Smith considers the specimen of *R. pimpinellifolia* in
the Linnaean Herbarium as undoubtedly *R. spinosissima*; and very
naturally concludes, that when Linnaeus added *R. pimpinellifolia*,
he did not recollect the plant to which he had previously given
another name. Dr. Wahlenberg, *Fl. Lapp.*, quotes *R. spinosissima*
of *Fl. Suec.* of Linnaeus, but with a mark of doubt, as a synonym
of
of his *R. majalis*, of which he declares, "Rami ramulique in maturō frutice sēpius toti inermes, rarius aculeis stipularibus paucis rectis gracilibus armāti." The principal, or rather, I believe, the only ground on which this reference is supported is, that the place of growth of *R. majalis* agrees with that pointed out by Linnaeus for *R. spinosissima*, and that no other Rose grows in similar situations.

Dr. Afzelius, in his *Tentamen primum de Rosis Suecanis*, p. 3, remarks, “that Linnaeus himself was at last inclined to unite *R. spinosissima* with *R. pimpinellifolia*; but that in earlier times he certainly was of a different opinion: because *R. pimpinellifolia* is not a native of Sweden, much less is it a plant growing ‘ad agrorum margines eorumque accervos passim;’ nor has it soft fruit. Therefore,” continues he, “we cannot doubt that Linnaeus at first intended some other species, which he afterwards seems to have forgotten; at first substituting in its place a Rose ‘germinibus ovatis,’ and afterwards confusing both with *R. pimpinellifolia*.” A little further on, Dr. Afzelius adds, that from an examination of the places pointed out by Linnaeus, it appears clearly that the species of *Rosa* called by him *spinosisima*, is one of the many varieties of *R. cinnamomea*. “Itaque,” he proceeds, “haec erit *R. spinosissima*, Linn. prima et vera, quae circa Upsaliam et alibi crescit locis indicatis, est frutex parvus surculis caulibusque junioribus spinosisimis, et fructus maturos habet rotundos molles, dulces, rubidos.” This account, if I understand it right, agrees with that of Dr. Wahlenberg: but if this is the case, some difficulty is introduced by the expression "caulibus junioribus spinosisimis;" as the young stems of *R. cinnamomea* are sometimes densely covered with setae, and in the usual language of botany, as applied to Roses, might be called rough; but it seems a considerable license to call them thorny. Another unfortunate circumstance with respect to this passage is, that we do not know
know what Rosa Dr. Afzelius means to indicate by the name of R. pimpinellifolia; and still less is it possible to conjecture what is the Rosa "germinibus ovatis," which was according to him first confounded by Linnaeus with R. spinosissima, and afterwards with that species blended into R. pimpinellifolia: but I have only been able to procure the first, second, third, fifth, sixth, seventh, eighth, ninth, and tenth of his Tentamina; in the last of which he resumes the consideration of this species, as described in the works of the Swedish botanists previous to Linnaeus, and no further. Perhaps, if I had been able to consult the eleventh Tentamen, I might have found all difficulties resolved. Be that as it may, the R. spinosissima of the Linnaean Herbarium is certainly the English plant, and no variety of R. cinnamomea. I can have therefore no doubt in retaining the name, which would be very reluctantly transferred to a plant almost without prickles or thorns.

Willdenow describes R. pimpinellifolia as distinct from R. spinosissima; as also does Gmelin, Fl. Bad. Als. ii. 415: but I cannot understand from either of them in what the difference consists, except in the "aculei sparsi," which is the essential character given by Linnaeus, in opposition to the "aculei confertii" of R. spinosissima, and is retained by both these authors. Dr. Roth, Fl. Germ. i. 217, and ii. 556, seems to acknowledge his inability to ascertain the difference.

4. Rosa involuta.

R. ebracteata, caulibus setigeris, receptaculis globosis, foliolis duplicato-serratis supra glabris, aculeis confertissimis.

Scotland, principally on the western coast. Glen Lyon, Rev. J. Stuart, D.D. Isle of Arran, Mr. G. Don.

This Rose is easily distinguished from \textit{R. rubella} and \textit{R. spinosissima}, by the double serratures of the leaflets. From \textit{R. Doniana} it is known with more difficulty; for though I have uniformly found the upper surface of the leaf without hairs in this species, with the exception already noticed in the description, and as uniformly pubescent in the other, yet I feel that it would be unwise to place an entire dependence on this character. Still, however, the expanded flower and comparatively scattered prickles of \textit{R. Doniana} seem to denote an essential difference between the two plants. The root-shoots of \textit{R. Doniana} are indeed very full of aculei, though less so than those of \textit{R. involuta}; and it must carefully be observed as a general rule in the comparison of these and of all other species of \textit{Rosa}, that we must draw the parallel between similar parts:—for instance, in the present case we must compare the strong surculi or root-shoots of \textit{R. involuta} with the surculi of \textit{R. Doniana}, and the branches of the one with the branches of the other; and not conclude that there is no difference if the surculi of \textit{R. Doniana} are as thorny as the weaker branches of \textit{R. involuta}; for in almost all Roses these strong shoots are decidedly more prickly than the rest of the plant.

If the distinctive character between this family of Roses and that of \textit{R. cinnamomea} be drawn from the bracteae, as I conceive must necessarily be the case, the young botanist may possibly be led by
by it to seek this species of Rose among the last-mentioned family; the permanence of the setæ, and their insensible gradation into aculei, which never occurs among that tribe, will serve to correct the error.

5. **Rosa Doniana**.

*R. ebracteata, caulibus setigeris, calycibus simplicibus, foliolis duplicato-serratis utrinque hirsutis, aculeis strictis inæqualibus sparsis.*


Gathered by Mr. G. Don of Forfar, on the mountains of Clova, and by Mr. Borrer by the water of Leith near Collington, also near Albourn and Henfield in Sussex.

I am very happy in the name of this species to have an opportunity of commemorating Mr. G. Don of Forfar, whose ability as an indefatigable investigator of our indigenous botany is well known, unfortunately now exerted no more. Mr. Don first gathered this plant, and distinguished it from *R. involuta*: and it merits observation, that though he relied entirely on the habit of the plant, all his specimens agree precisely with the artificial character I have adopted. Besides the particular differences pointed out under *R. involuta*, Mr. Don observed that the present
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species runs less at the roots than the other. This I have not had an opportunity of examining; but the roots of the Sussex plant appear to extend themselves considerably. The mode of growth is certainly much looser and more diffuse.

From *R. gracilis* this species is distinguished by its much smaller size, both in the whole plant and in each part; by its peduncles, almost invariably solitary, and by the total want of the large curved aculei so characteristic of that plant—From *R. Sabini* by the leaflets of the calyx, which in that species are uniformly divided. No other British Rose can be confounded with it.

6. **Rosa gracilis**.

*R. ebracteata*, caulibus setigeris, calycibus simplicibus, foliolis duplicato-serratis, utrinque hirsutis, aculeis majoribus falcatis.

*R. villosa*. *Engl. Bot.* ix. t. 583. (excl. Syn. et Fig. fructus)

The specimen figured in English Botany was sent by Mr. Robson, probably from the vicinity of Darlington; and I have received it from the same place under the name of *R. villosa*. In 1808 I observed
observed one or two plants of this species at Pooley-Bridge in Cumberland; and again in 1814. At the latter time I likewise gathered specimens from a plant in the neighbourhood of Keswick: but as I have neither seen nor heard of it elsewhere, I conclude it to be a rare plant.

I can hardly have any doubt as to the correctness of the synonym I have quoted. In the Rose figured in *Engl. Bot.* the prickles on the stem, by their number, scattered disposition, and slenderness, appear to indicate what I have called setæ, or at least the small aculei approaching to setæ. This point established, it must belong to the setigerous tribe; and we have only to determine between *R. Doniana*, *R. gracilis*, and *R. Sabini*. Unfortunately the large falcate prickles, the strongest character of *R. gracilis*, are wanting; but this is a circumstance which I conceive may occasionally occur in a single specimen; while on the other hand the size and habit of the plant, the binate peduncles, and the form of the calyx-leaves, induce me to refer it to this species rather than to either of the others, and the place of its growth strengthens this supposition. I am much more confident that the plant of *Engl. Bot.* is not the *R. villosa* of Linnaeus, or that of Hudson, or even of the *Flora Britannica*. The description “aculei caulini rariusculi” pointedly disagrees with the figure; and all authors unite in attributing to *R. villosa* “aculei sparsi;” and in this genus Linnaeus, from whom the term is borrowed, opposes “sparsi” to “conferti,” and uses it to express the comparatively small number of aculei. The term would therefore be quite inapplicable to this plant and to the figure in *Engl. Bot.*, supposing, as would necessarily be the case, the setæ (never before distinguished from the aculei) to be included under the same term. The figure of the fruit, in which the calyx is remarkably compound, appears to have been drawn from a different plant,
probably owing to none having been sent by Mr. Robson with his specimen.

Besides the marks enumerated under *R. Doniana* by which these species may be distinguished, the peculiar length, slenderness, and apparent weakness of the second peduncle of *R. gracilis* may be mentioned. From *R. Sabini* it may be known by the simple leaves of the calyx.

7. **Rosa Sabini**.

*R. ebracteata*, caulibus setigeris, receptaculis globosis, calycibus compositis, foliolis duplicato-serratis.


Mr. Sabine received this Rose from Mr. Vere's garden, where it was introduced by Mr. Jackson from Scotland. Mr. Borrer found it in the neighbourhood of Dunkeld; and I have noticed it near Hawes-Water in Cumberland.

The setæ will always readily determine the family to which this Rose belongs, if examined on the living plant or in good specimens; but I know no way by which to determine with any certainty specimens of Roses exhibiting only the flowering shoot and two or three leaves. From all other British setigerous Roses *R. Sabini* is distinguished by the divided leaflets of the calyx: the segments
segments may I believe always be observed if examined with attention; but they are sometimes so strictly capillary as hardly to be distinguished from very large and long setæ.

This Rose does not seem to have been before noticed; I have therefore given to it the name of a gentleman who has long cultivated and investigated the characters, principally of the foreign Roses, with the greatest care. The result of his labours will not I hope be long withheld from the public. It is by his assistance that I am enabled to distinguish this species from all others.

This species and the five preceding form the English portion of the family of *R. spinosissima*. *R. rubella*, *R. spinosissima*, *R. involuta*, *R. Doniana*, *R. gracilis*, and *R. Sabini*, all agree in having persistent setæ on the stems and branches, the stipulæ not increasing in breadth towards the inflorescence, or only in a slight degree, the flowers few together, and the fruit nearly round. I have already mentioned how slight my knowledge is of the exotic species; and perhaps in this subdivision I have fewer materials of comparison than in any other; but considering that the more completely I exhibit my ideas on the subject of the arrangement of the genus, the better chance I have of making my principles understood, I venture to mention *R. kamschatica* as the only foreign addition to the tribe at present known.

8. **Rosa villosa**.

*R. receptaculis subglobosis, calycibus simplicibus, aculeis rec- tiusculis subæqualibus, foliolis rhombeo-ellipticis, bracteis ellipticis.*

*R. pomifera*. *C. Gmelin Fl. Bad. Alsat.* ii. 410?
*R. glandulosa*. *Lam. et Dec. Fl. Fr.* vi. 539?
*R. helvetica*. *Römer’s Arch. b.* i. st. 2. p. 6?

Frutex
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"Gathered by the late Mr. G. Jackson in Scotland, and by the Rev. Hugh Davies in Wales; also between Edinburgh and Ravelston-Wood. It appears to be not very uncommon in England and Wales." Engl. Bot.

The specimen in the Linnaean Herbarium marked Rosa villosa is undoubtedly this species, though the aculei are shorter, stronger, and more curved than I have generally observed them. It is probable that the plant of our gardens which is generally known by that name, and R. tomentosa, were included by Linnaeus under the same species; but as the existing specimen agrees with the description, as far as that defines any one Rose, I have preferred assigning the name of R. villosa to this species, instead of retaining that of R. mollis, given in English Botany. We may be certain that Linnaeus intended the present plant—that he would have included the others is matter of supposition; and when it is found necessary to subdivide an original species, the Herbarium is the best authority to determine which plant shall retain the name at first intended to include the whole. In this case a further argument arises from the uncertainty of the plant intended under this name by other authors, and our inability to distinguish most of them from the numerous varieties of R. tomentosa.
On examination of the original specimens of *R. mollis* in the Herbarium of Sir J. E. Smith, it appears to me that, of the places of growth mentioned in *Engl. Bot.* Mr. Jackson's only can be safely quoted for this species, and that the others belong to *R. tomentosa*, to which I must also attribute the "*Rosa sylvestris, folio molliter hirsuto, fructu rotundo glabro, calyce et pediculo hispidis*" of Dillenius in *Raii Syn.* 478. The Rev. Hugh Davies observes, that in the plants he finds, the fruit varies from perfect smoothness to every degree of roughness; but as *R. villosa* and *R. tomentosa* have been hitherto described "*fructu hispido,*" and both species are liable to vary in that respect, I do not perceive that this observation can at all tend to determine the synonym. It is far more likely to be a smooth-fruited variety of *R. tomentosa* (which certainly occurs in Middlesex and Surrey), than the present species, which we have no reason to suppose was ever found in those counties.

I have drawn up the description of this plant from a specimen gathered in Mr. Vere's garden at Kensington, in September 1814, and from another gathered in Mr. Sabine's garden at North Mims in June 1815. These two plants proceeded originally I understand from the same root.

I have already observed, that in most of our Roses the earlier leaves of each sort are obtuse: this species seems to have a greater quantity of these leaves than most others.

A plant agreeing closely with these specimens is sold by Lee and by Loddiges under the name of *R. villosa*, except that the aculei are stronger and slightly curved, approaching therefore more closely to the plant of the Linnæan Herbarium: but though the general character of the aculei is of the greatest consequence, I do not find these minute differences much to be depended upon.

Though
Though very downy, the leaves of this Rose are generally green above; but I have specimens which are considerably gray. Mr. Sabine has a plant from Mr. G. Don, which differs from this only in a harsher pubescence.

\( \beta. \) caerulea. Fruit and peduncle nearly smooth; flowers blush-red. The glaucous waxiness of the young shoots is very conspicuous and very beautiful in this variety: the leaves are more glandular, the bracteae are in general smaller, and the habit is more slender than in \( \alpha \). The plant from whence I have taken this account was sent from Scotland, by Mr. G. Jackson, to Mr. Vere's garden, and from thence received by Mr. Sabine; but I have specimens nearly similar collected by Mr. Robertson near Newcastle, and by Mr. D. Turner at Killin; and I have met with it myself in Friar's Wood, near Ingleton.

\( \eta. \) concavifolia. Leaflets remarkably concave, or conduplicate and hoary. Bracteae lanceolato-ovate; receptacle globose. Scotland, Mr. Borrer.

\( \delta. \) suberecta. Fruit globose, that and the petiole furnished with strong setæ; flowers deep red. Stems stiff and upright; leaflets 7, sometimes 9, elliptic, concave; stem, petioles, stipulae, young prickles, and midrib, of a vinous red. The general appearance of this variety is such as to make me wish to consider it as a distinct species; but I have not been able to fix on any good character. In smell, in the abundance of glands underneath the leaves, and even in habit, it approaches somewhat to \( R. \) Eglanteria; it is not however entirely free from the turpentine flavour which accompanies
all this family; and the straight prickles render it impossible to mistake it for that species. If distinct, its place would be before *R. villosa*, as nearer to the family of *R. spinosissima*. The stipulæ are almost membranous, which would form an excellent character if it should be found constant. I have only seen it in one place, on a rocky limestone bank at Ingleton in Yorkshire; and at that time I was so puzzled by the multifarious appearance of the specimens I had collected, and which I had not had opportunity to arrange, that I did not pay it the attention it merited, and only preserved a single specimen.

It is with considerable doubt that I have quoted *R. pomifera*, *Fl. Bad. Alsat.*, as a synonym of this species. The author says, that sometimes two of the calyx-leaflets are divided, which might have induced me to refer it to *R. scabriuscula*; especially as the name seems to indicate a large-fruited Rose; and the fruit of *R. scabriuscula* is occasionally very large; but in other respects it does not agree with that plant.

I hesitate still more whether *R. glandulosa*, Lam. et Dec. *Fl. Fr. vi.* 539, ought to be considered as a smooth variety of this plant: it certainly approaches very near to it, except in the pubescence.

*Rosa helvetica*, Römer's *Archiv. für die Botanik*, is perhaps a dwarf variety of this species. Here again the description "*foliolis glabris inodoris*" renders it very doubtful.


*R. receptaculis ellipticis, calycibus subsimplicibus, bracteis ellipticis, aculeis rectiusculis subæqualibus, foliolis anguste ellipticis duplicato-serratis.*

Pr. p. 5.


If I were not fortified by the authority of Sir J. E. Smith and of Mr. Borrer, I should hardly venture to describe as a distinct species a plant so nearly approaching to some varieties of *R. tomentosa.* The calyx-leafs, indeed, though always in some degree pinnate, are never, as far as I have observed, completely furnished with offsets on each division as they are in that plant. In this respect it varies exceedingly, approaching however nearer to the compound calyx of *R. tomentosa* than to the simple one of *R. villosa.* On this character, such as it is, the specific distinction must principally rest; for the shape of the receptacle and leaflets, though sufficiently distinct in some specimens, still varies so much in this tribe of Roses that I dare not place much reliance on it. Still less can I depend on the greenness and harshness of the pubescence, the characters by which this Rose is more
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more particularly pointed out in Engl. Bot.; as the specimens which I have received from Mr. Winch, the original discoverer, are hoary with a velvety down, and exceedingly soft on both sides—perhaps even more so than is usual in any other species; and those which I have gathered myself agree with them in this as in every other particular. Mr. Winch also in his Botanist's Guide describes the leaflets as densely covered with down. I have reason to believe that the plants gathered by Sir J. E. Smith near St. Edmund's Bury, which in Engl. Bot. are attributed to this species, rather belong to R. tomentosa of this essay. The extreme variableness of this latter species (the Rose I have had the most opportunities of examining under different circumstances) induces me however to attach very little importance to this peculiarity in the pubescence.

10. Rosa heterophylla.

R. receptaculis subglobosis, calycibus subcompositis, aculeis rectiusculis subæqualibus, bracteis lancolatis.


Found by Mr. W. Borrer at Collington near Edinburgh, and elsewhere in that neighbourhood; also at Finlarig.

2 c 2 I do
I do not find any description to which this Rose can be referred. It seems to be called *R. villosa* by the Scotch botanists; but that name being appropriated to another species, I have given to the present plant the name of *R. heterophylla*, expressive of a character which it usually presents, and which gives to it a certain peculiarity of habit when compared with any other British species.

The Roses most nearly allied to this are *R. villosa*, *R. scabriuscula*, and *R. tomentosa*. From the first and last of these a proper attention to the leaflets of the calyx will distinguish it; and from *R. scabriuscula*, as well as from the two others, the remarkable shape frequently occurring in the leaflet, and the narrow bracteae.

11. **Rosa pulchella.**

*R. receptaculis obovatis, calycibus compositis, aculeis rectiusculis subæqualibus, petalis margine crenatis.*


On limestone banks at Ingleton in Yorkshire.

Like the foregoing, this Rose seems to have been unnoticed by preceding authors. It is easily discriminated by its crenate petals from all other British Roses: but this character it may be difficult to determine in the Herbarium, as the petals of Roses are apt to fall off, and when preserved generally shrivel very much in drying. The shape of the receptacle and the shortness of
of the calyx-leaf its appear also to be characters worthy of attention; but I have seen too little of it to be able to point out the variations to which it is most subject. The size and habit of the plant, the shape of the receptacle and that of the leaflets, will distinguish this from the common Apple Rose of the gardens; a species with which it would be ridiculous to compare it, were it not for the singular circumstance of the crenate petals—a character which, as far as my knowledge extends, is not to be met with in any other species of this genus.

12. Rosa tomentosa.

R. calycibus compositis, aculeis rectiusculis subaequalibus, petalis integerrimis, bracteis ellipticis, foliolis duplicato-serratis.


Rosa sylvestris pomifera major nostras. Rauii Synop. 455.


Common
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Common in hedges and bushy places throughout Great Britain.

I rely upon the shape of the leaflet and the entire margin of the petals, to distinguish this Rose from the *R. villosa* of the gardens, whose petals are crenate, a character pointed out to me by Mr. W. J. Hooker; and somewhat also on the smaller and less globular fruit; on the bractee, and on the shape of the leaflets, to separate it from *R. heterophylla*: on the entire margin of the petals, to mark it from *R. pulchella*; and on the very pinnate leaflets of the calyx, to divide it from *R. villosa* and *R. scabriuscula*. The plant thus discriminated includes so many varieties, or perhaps species, that it is certainly the most intricate of the genus. It undoubtedly embraces the *R. villosa* of Hudson, and the *Rosa sylvestris pomifera major nostras* of Ray, which has usually been quoted as a synonym of *R. villosa*. I should also feel confident that it included the *Rosa villosa* of the *Flora Britannica*, if the learned author had not assured me that that description was drawn up from the plant commonly known under the name of *R. villosa* in our gardens:—that, however, we have no reason to suppose a native of this country, though perhaps in the present state of our knowledge we should find it difficult to trace it to any other.

The characters proposed by British botanists to distinguish *R. villosa* from *R. tomentosa*, viz. the small ovate fruit and hooked prickles, do not by any means regularly go together. The size and shape of the receptacle and fruit vary much, as may be sufficiently seen in the ensuing catalogue of varieties; and even under that appearance from which I have drawn my description, indeed on the same bush, they may be observed large or small, more or less elliptic, more or less covered with setæ, or quite naked. The average shape in $a$ is however wider than in some
some of the varieties; and perhaps \( \varsigma \) and \( \xi \), in which they are remarkably elongated, might be taken for the *Rosa tomentosa* of the *Fl. Br.*; and the figure in *English Botany* is not very different from those varieties. Ray, however, says nothing of the curved aculei of his *R. sylvestris fructu majore hispido*, the synonym quoted by Sir J. E. Smith; while, on the contrary, he describes the fruit of *R. sylvestris pomifera major* "fructus pyri parvi forma et magnitudine"—a description which appears exaggerated if applied to *R. tomentosa* \( \eta \) of this essay, but which agrees with that variety better than with any other; but perhaps still better with an appearance sometimes met with in *R. scabriuscula*. Ray adds "spinulis obsiti;" a description which altogether does not agree with any fruit I have seen; but which we may easily perceive cannot indicate the same thing as the "germen globosum" of Linnaeus; especially if we consider that in this family the fruit is uniformly rounder than the immature receptacle. Hudson has merely joined the synonym of Ray to his *R. villosa* \( \beta \), without adding any remark of his own to either variety. Lightfoot, *Fl. Scot.* i. 261, has added, that the fruit is black when ripe; a circumstance which renders his species very doubtful.

In such a labyrinth what is the course to be pursued? I have already mentioned in the account of *R. villosa*, that in the appropriation of that name I have followed the Linnaean Herbarium. *R. tomentosa* is therefore left for this; and as the name cannot reasonably be objected to in a genus where it is so difficult to find names at all characteristic, and as some of the varieties are already well known under this name, I cannot hesitate to preserve it. The synonyms above quoted do not appear to me at all doubtful as to the species; but I have not attempted the difficult, or rather impracticable, task of determining the correspondence
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dence between my varieties and the varieties or species of preceding authors.

I have made several attempts to form such an arrangement of the varieties of this Rose as might keep together those plants whose natural character would point out the probability of their constituting distinct species, and separate those whose habit seemed to announce important differences. This attempt has failed; but I believe in the following list the order adopted is not far from a natural series. If the botanist who knows the species be able to assign to the specimens he collects their place among these varieties, my object will be attained.

I have here been obliged to use the word *hirsutus* rather than *setosus* to the arms of the peduncle and receptacle, in order to include the variety $\alpha$, which has a downy peduncle without either glands or setae, while yet it is characterized by a receptacle smoother than the peduncle.

$\beta$. differs from $\alpha$ only in having the upper pagina of the leaf entirely smooth. Ambleside, Westmoreland.

$\gamma$. Leaves smooth on both sides. By the road on the north side of Loch Tay, Mr. W. Borrer.

$\delta$. has a rounder leaflet than $\alpha$, with scattered hairs on the upper surface, and scattered hairs and glands on the under; the nerves on the underside of the leaf are thickly clothed with hairs somewhat spreading; petals white. The earliest flowers in this variety frequently have the leaflets of the calyx entirely simple, nearly linear, and expanded at the end: the latter peculiarity, where it exists in a remarkable degree, though pointed out in English Botany as a character of the *R. mollis* of that work, appears to me a sure indication of an unnatural or imperfect state of inflorescence. Dunkeld, Mr. W. Borrer.

$\varepsilon$. Fruit
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§. Fruit subglobose; receptacle frequently elliptical; peduncles sometimes extending beyond the bractæ, from one to eight or nine in a cyme; petals blush-coloured, white at the base; prickles falcate; leaflets very soft, without glands, except on the nerves and serratures. Near Newcastle, Mr. Robertson. Tunbridge Wells, Penshurst, Stoke Newington, and Ulverstone.

ζ. *hybrida.* The leaves of this plant are green, not white with down, hairy underneath, and rough with glands; receptacle as setose as the peduncle; aculei falcate. Pointed out to me by Mr. Sabine under the name of *R. hybrida.* I have observed a similar Rose near Keswick, and also in the neighbourhood of Godstone in Surrey. Mr. Borrer has specimens much resembling it from Scotland, in which the receptacle is globose.

η. Receptacle large, olive-coloured, attenuated at the base, less setose than the peduncles; peduncles one to four, furnished with weak setæ; leaflets rough, with glands on the underside, except those on the young shoots which are very soft and downy; the aculei vary very much, some even on the strong stems being quite straight, while in general, even on the young branches, they are considerably curved; whereas in this genus the root-shoots have usually the prickles stronger and more curved than the branches. This variety of *R. tomentosa* bears a considerable degree of resemblance to two other very distinct species, *R. micrantha* and *R. Borreri,* and at the same time in general appearance is not very different from the variety ; I have only seen three plants; two between Down and Holwood in Kent in July 1815, both of which at first sight I took for *R. micrantha,* until the thorns, which are never
uncinate as in that plant, and the downiness of the young leaves undeceived me; and one near Potter's Bar in Hertfordshire, in the autumn of 1814, which I supposed at that time to be *R. Borreri*. The latter had eight ripe fruit, having probably had at least twelve flowers in a cyme; on the others I could not find more than four.

3. Receptacle elliptical, as setose as the flowerstalk; peduncles often longer than the bracteae; leaves densely villous, glandular underneath. Sent by Mr. G. Don to Mr. Sabine under the name of *R. mollis*.

1. *sylvestris*. Receptacle a long ellipsis, as setose as the peduncle; peduncle shorter than the bracteae; aculei falcate; leaflets narrower than in α, slightly pubescent above, hairy and rough with glands on the under side; surculi dark purple. Received by Mr. Sabine from Mr. Donn of Cambridge.

2. *canescens*. Receptacle broadly elliptical, nearly smooth; aculei slender, but slightly curved; leaflets elliptic, oblong, concave, very soft, white, with down on both sides, glandular beneath. The calyx-leaflets of this variety are very much divided, and have a strong tendency to grow out into leaves; in some of the early flowers they are, however, nearly simple, with only a few laciniæ, broad at the base, lying in a direction parallel to that of the leaflets. Stock Gill and Kentmer, Westmoreland, and Pooley-Bridge, Cumberland.

7. Receptacle broadly elliptical, somewhat attenuated at the base, less setose than the peduncle; aculei falcate; has much the habit of the following variety. Gathered by Mr. Borrer in Scotland in 1810.

12. Peduncles as long or longer than the bracteae; receptacle as setose as the peduncle, and generally somewhat attenuated at
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at the base; offsets of the calyx-leaflets remarkably short and broad; petals white with red blotches; leaves somewhat concave. Highlands, Mr. W. Borrer.

\( \alpha \). Receptacle elliptical, attenuated at each end; peduncle longer than the bractæ; aculei falcate; leaflets narrower than in \( \alpha \), with a few hairs above, hairy and glandular beneath like the variety \( \eta \). This seems to have some affinity with \( R. micrantha \), but in a different way. The principal peculiarities are in the long peduncles, in the aculei, which, though never uncinate as in \( R. micrantha \), are yet more constantly curved than in most of the preceding varieties of \( R. tomentosa \), and in the narrow leaflets. It sometimes approaches in scent to \( R. Eglanteria \); and the first time I gathered it in this state I did not doubt that I had found the American sweet-briar, \( R. suaveolens \) of Rees’s Cyclopædia. The upper surface of the leaves is sometimes almost smooth, at others quite soft and downy; both sides are occasionally densely pubescent. Near Henfield in Sussex, Mr. W. Borrer. Kent, Surrey, and Middlesex.

\( \zeta \). differs from \( \alpha \) only in the want of glands on the under surface of the leaves, excepting occasionally on the nerve. Like that variety it is sometimes almost smooth, sometimes densely pubescent. Near Durham, Mr. Robertson. Lancashire, Westmorland, and Middlesex.

\( \omega \). incana. Receptacle elliptical, smooth; calyx-leaflets downy, without glands; peduncle with only a few hairs; aculei falcate; young shoots purple-gray; leaflets narrower than in \( \alpha \), with a hoary pubescence, without glands; but the colour is less striking than that of the variety \( \omega \). Stipulæ also downy and without glands. Sent from Scotland by Mr. G. Don to Mr.
Mr. Sabine, in whose garden is the only plant I have ever seen.

Perhaps of these varieties \( \zeta \) may be a distinct species; \( \Omega \) and \( \iota \) may possibly form another; \( \eta \) a fourth; and \( \upsilon \) and \( \xi \) a fifth; and \( \sigma \) a sixth: this would seem a very great multiplication of species, and it would be extremely difficult to find for them any specific characters. Another obstacle to considering these as six species, arises from the great number of other varieties, which after repeated examinations I found myself unable to class with any one of them, and of which the distinctions are nevertheless exceedingly trifling. I have therefore above detailed the account of these, in hopes of exciting the attention of some botanist whose talents and opportunities will enable him to do more justice to the tribe.

To some one or other of these varieties we must probably attribute the *Rosa mollissima*, Gm. *Fl. Bad. Als.*; but in a genus so intricate, and with descriptions so defective as have hitherto been given of the Roses, I find the difficulty exceedingly great of assigning the synonyms of preceding authors to the proper species, and utterly impossible to trace them to their corresponding varieties.

The description of *R. montana*, Lam. *et Dec. Fl. Fr. vi. 532*, would induce me to join it to this species; but Willdenow, *Sp. Pl. ii. 1076*, refers the original plant of Villars, which is quoted also by Lamarck and Decandolle, to a Rose with hooked prickles ("aculeis uncinatis"), and which would agree tolerably well with *R. Borreri*. Among these inconsistencies I pretend not to decide what Villars intended, or what plant was meant by the French and German authors.

*R. fætida*, Lam. *et Dec. Fl. Fr. vi. 534*, may perhaps be *R. tomentosa \( \beta \)*; but the authors compare it at once with *R. collina* and their
their own *R. tomentosa*, two very different plants. “Aiguillons un peu courbés” is a character hardly inconsistent with any variety of this plant; though in some they are frequently to be met with quite straight. The fruit is said to give a fetid smell when rubbed; a quality I have never had the opportunity of observing.

To the same variety, or to γ, we may perhaps refer *Rosa andegavensis* of the same work, vi. 539. It agrees very well with the usual appearances of this species, except in the pubescence.


*R. receptaculis globosis, calycibus compositis, aculeis rectiusculis, foliis simpliciter serratis.*


Near Ambleside in Westmoreland.

No Rose hitherto published can be quoted as a synonym of this species; or at least its most remarkable peculiarity, the union of straight aculei unmixed with setæ, with smooth leaves furnished only with simple serratures, has never been noticed. Perhaps, however, I shall hardly be considered justifiable in admitting it in the enumeration of species, since I have only one specimen, which was gathered without particular notice among others from the hedges on the side of the road between Ambleside and Clappersgate. Had I known with what species to join it,
it, it would not have obtained a place by itself: its nearest affinity is probably *R. tomentosa*, from which however the peculiarities above remarked separate it widely. The petiole and the midrib of the leaflets are usually of a reddish or purplish hue; and in these circumstances, and perhaps also in habit, it is somewhat allied to the *R. rubrifolia* of Villars. That Rose, however, claims a nearer affinity with *R. casia*; but I should suppose, from the descriptions I have met with, that the aculei are straighter and the serratures more simple than in that species.

This Rose concludes the account of the British Roses of this family, consisting of six species; viz. *R. villosa*, *R. heterophylla*, *R. scabriuscula*, *R. pulchella*, *R. tomentosa*, and *R. nuda*: it is characterized by the want of setae on the stems; the stipulae changing more or less into bracteae; and by aculei nearly straight, or at least not uncinate.

14. **Rosa Eglanteria.**

*R. fructibus obovatis, aculeis inaequalibus majoribus uncinatis, foliolis hirsutis subtus glandulosis duplicato-serratis.*


*R. suavifolia. Fl. Dan. t. 870?*

*R. sylvestris odorata. Raui Synops. 454.*

*Frutex 4—7-pedalis. Rami suberecti, virides, juniores fuscescentes, aculeati; aculei valde inaequalis, majoris uncinati, minores rectiores, minimi rectissimi, sed nunquam ut credo in setas immutati; aculei majoris interdum binato-stipulatæ, ceteri semper sine ordine sparsi. Petiolis tomentosi, glandulosi, aculeis falcatis instructi: deficient setæ. Stipulae lineares, glandulis tenerrime serratæ, vel potius ciliatae, et floribus*
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In bushy places on a dry soil in Kent, Sussex, and Surrey. Sometimes very abundant on the chalky banks in those counties.

β. is a variety in which the larger aculei are falcate, not uncinate; and which seems to want the character arising from the increased magnitude of the setæ at the base of the germin. This may possibly be a distinct species.

The only Rose of our country which can be confounded with this is *R. micrantha*; and occasionally, when the latter grows in exposed situations, or when *R. Eglanteria* is found (which is rarely the case) in moist hedges, the eye will not immediately distinguish them. In general, however, *R. Eglanteria* is a stiff, compact, upright bush; *R. micrantha*, a loose straggling briar. In all cases the central flower of the cyme, the one which is first expanded, is followed by an obovate or pyriform fruit in the former species; while in the latter the fruit is at most only elliptical, and almost always terminating in something of a neck,—a distinction first pointed out in *Engl. Bot.*, and well marked in the figures of the two plants. Another equally constant character is derived from the aculei, which in *R. micrantha* are in general merely binato-stipulary, with a few others scattered without order on the branches—all nearly of a size, and never intermixed with a multitude of smaller
smaller ones. In *R. Eglanteria* the aculei of the shoots, and frequently those of the branches, are mixed with scattered prickles of all sizes; though in small specimens this character may sometimes be wanting. In both species a few setæ may occasionally be noticed on the stem immediately below the inflorescence; but these seem to be merely accidental.

Mr. Borrer found a Rose in Normandy nearly allied to this, and most resembling the variety β; and Mr. Hooker brought specimens of the same from the South of France; but it has not been described by the French botanists, or at least I cannot appropriate to it any of their descriptions.

This Rose has been very unfortunate in its name; it is called eglantina, eglentina, and eglentina, by Bauhin and the early botanists. Linnaeus in his first edition of the *Species Plantarum* called it *R. Eglanteria*; but in the second he transferred that name to the single yellow Rose, still however quoting the same synonyms, all of which clearly belong to this plant. And this species is not given, nor does the name of *R. rubiginosa* occur, until the publication of the *Mantissa Plantarum altera*: indeed it seems as if Linnaeus at one time confounded the two species, misled merely by the circumstance of the glandular and fragrant leaf, which is almost the only character not common to the whole genus, in which these two Roses agree. Notwithstanding *R. rubiginosa* has been adopted by most of the modern botanists, I have ventured to restore the name originally given by Linnaeus, in which I am supported by the authority of Hudson and of Poiret, *Encycl. Nat*. The yellow Rose, which is not a British plant, has latterly been more properly named *R. lutea*, from the hue, which is very rare in flowers of this genus.
15. *Rosa micrantha*.

*R. fruticibus ampullaco-ellipticis, aculeis aduncis subæqualibus, foliolis hirsutis subtus glandulosae duplicato-serratis.*


*Fructus parvus coccineus, interdum ellipticus, sed sæpius plus minusve urceolatus.*

Hedges and bushy places in the southern and midland counties.

This species was first established by Sir J. E. Smith in *English Botany.* Its closest affinity is certainly to *R. Eglanteria*; and I have already pointed out under that Rose the characters by which these species are best discriminated. I may add, that the present plant uniformly wants the strong setæ at the base of the fruit, which I have constantly found in *R. Eglanteria,* except in the rare variety β, which in most other respects assumes an appearance directly opposite to *R. micrantha.* The habit of this species is indeed so loose and straggling, that an inattentive observer might pass it over as a variety of *R. canina.* The fruit is always small, and never has the pear-shaped form of the primordial fruit of *R. Eglanteria*; the flowers are also generally smaller, but this is an uncertain mark. The scent varies exceedingly, being sometimes very weak, at other times not to be distinguished from that of *R. Eglanteria,* and once or twice I have observed the turpentine flavour which is generally to be perceived in...
in the family of *R. tomentosa*. *R. micrantha* has also considerable affinity with *R. Borreri*: it may however be distinguished from that species by the much stronger and more numerous setæ of the peduncle generally extending on the fruit, by the narrower pinnæ of the calyx, and by the glands covering the whole under surface of the leaf; the general colour of the plant is also a paler and yellower green.

*R. sempervirens*, Roth Fl. Germ. i. 218. ii. 556; *R. umbellata*, Lam. et Dec. Fl. Fr. vi. 532, seems to be allied to this plant, but can hardly be identified either with this or with *R. Eglanteria*. It might be expected that the Rose mentioned in the account of *R. Eglanteria* as having been gathered by Mr. Borrer and Mr. Hooker in different parts of France, would be found among the descriptions of the French botanists; but I cannot refer it with confidence either to *R. sepium* or *R. umbellata*. If distinct, we may consider this subdivision of the large family of *R. canina*, distinguished by compound serratures and glands under the whole surface of the leaf, as composed of four species; *R. Eglanteria*, *R. micrantha*, *R. umbellata*, and one yet unnamed. I dare not at present admit *R. sepium* among the number.


*R. receptaculis ellipticis, pinnis calycinis confertis, aculeis uncinnatis subæqualibus, foliolis hirsutis eglandulosis duplicato-serratis.*


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Hedges and thickets, not uncommon.

β. Leaves hoary, with pubescence on both sides. Near Edinburgh, Mr. Borrer.

The leaves of this species are generally of a very dark colour, and always remarkably flat; the young leaves are tender at the edge, and frequently tinged with purple. This character it has in common with R. dumetorum and R. surculosa; but both these plants have simple serratures; and these marks, as well as the peculiar breadth of the terminal leaflet, may assist the investigator, in addition to the specific character and to the particularities already pointed out under R. micrantha, in distinguishing it from that species: from which, notwithstanding its affinity, it also strikingly differs in general habit. The irregularity of the serratures in R. collina may sometimes create a difficulty between this and that species. The calyx-leaflets, the dark-green flat leaflets, and the broad terminal one, may help to decide in doubtful cases; yet some specimens I have been obliged to join to R. Borreri merely on account of the double serratures of the leaflets: and in the autumn of 1814 I observed a plant near Southgate, which, with all the other characters of R. Borreri, had nevertheless simple serratures: in 1815 the same plant had compound serratures. I have examined perhaps a hundred plants of this species, and my friends Mr. W. Borrer and Mr. E. Forster probably
probably as many more, without meeting with any other instance of such an anomaly; nor has a similar one been observed in any other species.

The artificial character which separates this from *R. caesia* seems to be slight; yet it is I believe constant; and as there is no approximation in habit, there will be no difficulty in distinguishing the plants. No synonym of any foreign author can be referred with certainty to this species.

17. *Rosa caesia*.

*R. receptaculis ellipticis, pinnis calycinis raris, aculeis uncinate subaequalibus; foliolis hirsutis eglandulosis duplicatosserratis.*


At Taynuilt in Mid Lorn, Argyleshire; and in Strath Tay, between Dunkeld and Aberfeldie, Mr. Borrer. Side of Loch Tay, Mr. G. Anderson.

I have endeavoured in the description of *R. Borreri* to show the differences between that species and the present. *R. collina* is still nearer in character; and I fear that in the present state of our knowledge I can only point out the few and small pinnae of the
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the calyx-leaflets as a decided mark of separation; for the double serratures of the leaflets are sometimes rather ambiguous, and always less strongly marked than those of R. Borreri; and the simple serratures of R. collina, though I believe never strictly compound, are yet frequently so irregular and unequal as to produce something of the same appearance. From R. hibernica R. cæsia is artificially distinguished by the total want of the smaller scattered aculei. I have never seen this plant in a living state; but Mr. Borrer assures me that the dense mode of growth, glaucous shoots, and hoary blueish gray foliage, contribute to give it an appearance very different from that of any other Rose.

Rosa rubrifolia of Villars, Dauph. iii. 549, seems intermediate between this species and R. nuda. Baron Fr. X. Wulfen, in Römer's Archiv. für die Botanik, mentions a Rosa glaucescens which in some respects resembles this; while in others it seems to unite better with R. collina.

The Rose with leaflets pubescent on the underside, mentioned by Afzelius in his Tent. de Ros. Suec. as confounded in Sweden with R. canina, is supposed by Sir J. E. Smith in Engl. Bot. to belong to this plant; it seems to me to be decidedly my R. collina β.

18. Rosa sarmentacea.

R. stylis distinctis, receptaculis ovatis, aculeis uncinatis, foliolis duplicato-serratis glaberrimis.

R. canina. Roth Fl. Germ. i. 218; ii. 560.

Frutex 8—10-pedalis. Rami diffusi, olivacei, aculeati; aculei adunci, nunc rari, sparsi, nunc solitarii vel binato-stipulares. Petiolî absque pubescentia, hic illic glandulosi, aculeisque falcatis basi expansis muniti. Stipulae spatulate, glabrae, serratae, serraturis interdum glanduliferis; eae floribus propiores etiam solitariis multo latiores, tandem foliis deficientibus in bracteas ovatas acuminatas immutatae; ad florum ex summis bracteæ illæ numerosiores, sed basi angustiores. Foliola 5 vel 7, elliptica, par superior et foliolum impar ceteris majora, subacuminata, glabra, supra cerea, subtus interdum nervo-aculeata.
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aculeata, serraturis inæqualibus, plerumque divaricatis, irregulariter serrulatis. Pè-
dunculi 1—8, glabri, bracteis breviores. Receptaculum auguste ellipticum, fuscum, glabrum. Calycis foliola glabra, triangulari-elliptica, acuminata, pinnis lanceolato-li-

Common in hedges and bushy places.

β. nitens. The leaves, instead of the gray waxy appearance they generally have, are of a shining green: this variety has frequently a few setæ on the fruitstalk. Mr. Borrer finds this character also in α. I have observed one specimen further remarkable by its straggling habit and small leaflets, with long ragged-looking serratures; perhaps it ought rather to be considered as belonging to the variety γ. In hedges.

γ. A dwarf variety of very lax and feeble growth, which is occasionally met with in waste ground and on waysides: the leaflets are rarely more than five, elliptico-lanceolate, or even sometimes lanceolate; the serratures are narrower and longer. It is remarkable that in this variety, while the leaflets are always narrower than in α, the leaflets are generally wider.

δ. is a very large plant, which has the fruit and even the immature receptacle nearly globose; the calyx-leaflets are also frequently glandular. At Settle and other places in the mountainous district of the North of England.

ε. A variety with very small flowers, and a habit not unlike that of R. casia. At Settle.

ζ. A large but slender plant, with flowers always solitary. Receptacle broadly-elliptical. Road-side near Furness Abbey.

I am disposed to refer to this species R. micrantha, Lam. et Dec. Fl. Fr. vi. 537. The name I have adopted is derived from the
the manuscript observations of Professor Swartz, communicated by him to Mr. Robertson of Newcastle.

The setae which are occasionally met with on the peduncle of this tribe of Roses have a very different appearance from those of the straight-thorned Roses and of *R. Eglanteria* and *R. micrantha*; they are extremely feeble, hardly even stiff enough to support the gland by which they are terminated, and frequently passing into mere hairs without any gland: indeed in the former tribe the setae seem to indicate an attempt to produce aculei; and it is sometimes difficult to say whether the latter name would not be more appropriate: in this they have the appearance of an endeavour to form hairs; and as they gradually diminish in strength and in the size of the terminating gland, till at last it entirely disappears, it is not always easy to decide to which sort of arms they belong. Thus, extraordinary as it may seem, we have in this genus hairs and prickles passing into one another by steps almost insensible.

The plant most nearly allied to this is undoubtedly *R. canina*, from which it is to be distinguished by its double serratures: by the smooth leaflets without either hairs or glands on the under surface, it may be easily known from *R. micrantha*; and the want of hairs will readily distinguish it from *R. Borreri* and *R. caesia*; but as I am always unwilling to rest upon this character alone, when the difference of habit is supported by any other, I will observe that the shape of the leaflet, and its being always more or less carinate in this species, will be a decided mark of separation from the former of these plants; and the same character, though the difference is less distinctly marked, and the pinnae of the calyx leaflets, will make it known from the latter.
19. **Rosa bractescens.**

*R. receptaculis globosis, aculeis uncinatis, foliolis simpliciter serratis subitus tomentosis, bracteis fructus superantibus.


Hedges about Ulverston, Lancashire.

β. *Stipulae* nearly smooth; calyx-leaf is glandular. At Ambleside in Westmoreland.

I am not aware that this Rose, though presenting a very striking character, has been noticed by any preceding botanist; from that character the present name is adopted; but my choice was confined by the use of names previously introduced from characters somewhat similar. *R. bracteata* is the well-known name of a very different species; and Thuilliers has given the name of *stipularis*, which would have been the most appropriate, to a Rose with which I am unacquainted, but which cannot be confounded with the present.

From *R. dumetorum*, independently of certain marks which will be pointed out in the description of that species, *R. bractescens* may be known by the rounder receptacle, the mass of woolly styles, and the immense bractæ. This latter is an important character by which it may be distinguished from the other Roses with hooked prickles and simple serratures; from most of which it also
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also differs in having the leaves pubescent on both surfaces: to this may be added, that the aculei are more slender and less curved than is usual in this tribe, though quite enough so to show that they belong to it; and they are also more numerous, and the petioles are very rarely unarmed. The entire pinnae of the calyx seem to be constant in this Rose, a circumstance seldom to be met with in those which resemble it most nearly. Its closest affinity is certainly with R. collina; but a careful attention to the above marks will be sufficient to distinguish it.

20. Rosa dumetorum.

R. stylis distinctis, receptaculis ellipticis bracteas superantibus, aculeis uncinatis, foliolis simpliciter serratis utrinque hirsutis.

R. dumetorum. Thuilliers Fl. des Env. de Paris, 250.

R. canina §. Desvaux J. de Bot. ii. 115.


Hedges in the southern counties occasionally; seldom in any abundance.
This is generally a weak straggling Rose, which, in the instances which have fallen under my notice, does not flower very freely. Mr. Borrer, however,—to whose accurate observations this essay is in many instances deeply indebted,—finds a plant in the neighbourhood of Henfield in Sussex, which, agreeing in other respects with this, is yet neither of feeble growth nor unwilling to flower. Even under this appearance the aculei are usually smaller and weaker than in the neighbouring species.

\(\beta\). has a stronger growth and larger aculei than are usual in \(\alpha\); the pinnae of the calyx are also narrower, the flowers in a cyme, much more numerous; and both in appearance and character it approaches very near to \(R.\ surculosa\).

\(\gamma\). has a leaflet of a very dark shining green, much longer than usual in \(R.\ dumetorum\). I have seen very little of it, and have therefore for the present joined it to this plant on account of the small bracteae, small aculei, weak growth, and the pubescence of the leaves, which are decidedly hairy on the veins and on the surface beneath, and exhibit some scattered hairs on the upper surface: but it must be confessed, that in the shape of the leaflet and the general appearance of the plant it has little affinity with this species.

If we except the doubtful variety \(\gamma\), the flat leaves of this Rose (a considerable portion of which in every plant is either subrotund and acuminate, or at least very much rounded at the base) will distinguish it, without reference to the pubescence, from \(R.\ sarmen-\) 

tacea, \(R.\ collina\), and \(R.\ canina\). This form and expansion of the leaf it has in common with \(R.\ Borreri\) and \(R.\ surculosa\); but the first has its leaves doubly serrated, in the latter they are always entirely smooth on both sides. I have already recorded an observation which throws some doubt on the former character;
and the latter is in so many instances in other families known to be variable, that I am unwilling to depend upon it entirely in this. Yet the three Roses are different in habit, and I have not been able to fix on any more permanent distinction.


R. stylis distinctis, aculeis uncinatis subaequalibus, foliis simpliciter serratis subtus tantum hirsutis.


β. pallescens.


Hedges in the southern counties occasionally.


Stems stronger but more diffuse, brown; aculei strong, brownish, and much more hooked than in *R. collina* β; leaflets of a bright shining green on the upper surface, generally somewhat carinate, while in β they are rather slightly concave; tips of the serratures fusco-cartilagineous. Flower-stalks one to nine. Receptacle broader than that of β.

2 F 2

Flowers
Flowers sometimes white, sometimes of a full blush-colour. Fruit often subglobose. Hedges throughout England very common.

δ. A compact bush three or four feet high, thick with leaves, the leaflets small, very acute, silky underneath. Near Dovedale, Derbyshire.

There is no species of Rosa in which my endeavours have been more unsuccessful than in this. I am neither satisfied in what I have joined together, nor in the marks by which I have attempted to discriminate it from other species. The variety α is adopted merely from Jacquin; and, as far as is at present known, is not a British plant. I have therefore drawn up my description from the variety β: an examination of the specimens of R. collina possessed by Sir J. E. Smith, and of those in the Herbarium of Sir Joseph Banks, and a comparison of these with the figure in the Flora Austriaca, enable me to state that this variety differs only from α in the want of hairs or glands on the peduncle. In this state it approaches very nearly to R. bractescens, being scarcely distinguishable, except by the somewhat smaller bracteae and the entire nakedness of the upper surface of the leaf; and as that species has frequently a glandular, or rather a weakly setose peduncle, exactly like that of Jacquin's figure, I have doubted whether I ought not rather to have attributed the name and synonym to that plant. Jacquin, however, could hardly have passed unnoticed the remarkably enlarged bractescent stipule accompanying the inflorescence of R. bractescens; he describes the prickles as "validi," although in the figure they are represented as much weaker than is the case with most Roses of this subdivision of the genus, and the foliolae as "atro-virentia," whereas they are figured pale and glaucous; both figure and description attribute a dark cartilagineous summit to the serratures. These circumstances
cumstances induce me to believe that Jacquin would have included in his species most, if not all, of those different appearances which I have united into mine. The glandular footstalk varies in *R. bractescens*, *R. canina*, and other neighbouring species; which will justify us in rejecting it from the essential character in this instance, though a most diligent search has not succeeded in bringing to light a single instance of glands or setæ on the peduncle of any variety a native of this country:—once, indeed, on one plant I found a few hairs on that of the variety γ.

This last-mentioned variety is certainly a very different plant in appearance from either α or β, and may perhaps be a distinct species; but I have found myself unable to find any character by which it might be separated; and it besides varies greatly in itself both in habit and in character. The leaflets are sometimes almost as broad, but I believe never as flat, as those of *R. Borreri* and *R. dumetorum*; and the calyx-segments sometimes approach in shape and number to those of these plants; the serratures too, though never double, become sometimes exceedingly unequal. At other times the long leaflets and equal serratures might lead one, without the inflorescence, to refer it to *R. systyla*. To this variety I should refer the Rose which is mentioned by Afzelius as a hairy variety of *R. canina*, and quoted by Sir J. E. Smith under *R. caesia*: some further observations on Afzelius’s varieties of *R. canina* will be found in the account of that species. The glandular fringe of the serratures sometimes passes into hairs.

Of the variety δ I have only seen one plant, and that before its flowers were open: it was a compact bush, between three and four feet high, abounding in flower-buds; and the numerous small and very acute leaflets gave it a peculiar appearance.

In Römer’s *Archiv. fur die Botanik, Band i. p. 6. Aus. A. ab Haller, R. collina* is described as having the upper surface of
the leaves shining, with a silky pubescence. The author refers to Jacquin; but he must I think totally have mistaken the plant.

*Rosa arvensis*, Roth *Fl. Germ.* i. 217, & ii. 554; *R. corymbifera*, Gmel. *Fl. Bad. Als.* ii. 424, resembles in some respects the variety γ; but the leaves are said by the latter writer to be hairy on both sides. It is not explained whether the serratures of the leaves are double or single; Roth describes his plant as a robust shrub ten feet high, with leaves attenuated at both ends; a character which rather belongs to this than to any other of the pubescent-leaved Roses of the *canina* tribe.

Perhaps to this species we must refer *R. leucantha*, Lam. *et Dec.* *Fl. Fr.* vi. 535, which has white flowers, and occasionally a few hairs on the upper surface of the leaves. *R. fastigiata* (of the same work and page) may likewise be a sub-variety of *R. collina* γ, with flowers more numerous than common; the shape of the leaves will not permit me to join this latter to *R. surculosa*, with which otherwise the flowers "disposés en corymbe assez large" might indicate an affinity. All Roses with hooked thorns of nearly equal size, having the leaflets smooth above, and the petiole and midrib on the under surface hairy; the styles distinct and included, or nearly included, in the *germen*,—must be considered as belonging to this species. I must leave it to future investigators to decide on the one hand, whether these characters are sufficient to distinguish it as a species from *R. canina*; and on the other, whether with so much difference of habit it ought not itself to be further divided.

**22. Rosa hibernica.**

*R. receptaculis globosis, aculeis uncinatis inæqualibus, foliolis simpliciter serratis.*

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In Ireland, Mr. Templeton. Engl. Bot.

I have never seen this plant in a wild state. The curvature of the aculei is generally less than in other Roses of this tribe,—a character in which it agrees with R. bractescens; but the simple serratures will readily distinguish them both from all the varieties of R. tomentosa; and the aculei rest on a longer base than is found on that plant. From R. bractescens and R. collina this species may be known by its dwarf rigid habit; but the most important character is derived from the mixture of small straight prickles on the branches. It is true that R. hibernica has this character in common with R. Eglanteria; but the entire want of glands, the simple serratures, and the shape of the fruit, render it impossible that any mistake should arise between them.

23. Rosa canina.

R. stylis distinctis, aculeis cauliniis uncinatis petiolinis falcatis, foliolis carinatis simpliciter serratis glabris.


Rosa sylvestris inodora seu canina. Raïi Syn. 454.

Frutex laxus, 6—8-pedalis. Rami diffusi, olivacei, aculeati; aculei uncinati, subbinato-stipulares. Petioli pubescentes; aculeis falcatis, atque hic illic glandulis sparsi mutili.
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Common in hedges and bushy places.

Under this name our early botanists seem to have included (besides the present species) *R. sarmentacea*, *R. Borreri*, *R. dumetorum*, *R. collina*, *R. surculosa*, and *R. systyla* of this essay. After all these reductions it must still be considered as a very variable Rose. I will attempt to enumerate the principal differences of appearance to which it is subject.

ß. *cerea*. The young leaves are covered with a waxy substance, and till rubbed are of a glaucous green entirely without gloss. Root-shoots are more freely produced in this variety than in α, and I have sometimes met with as many as eight flowers in a cyme. The plant is eight or ten, and sometimes even fifteen, feet high; the leaflets are broader, and the little point at the end is always a little twisted; a character which may be observed in a slight degree in α, but is more conspicuous here. This is a very beautiful Rose, and more common than the preceding variety, from which I have drawn my description, because *R. canina* has been almost always described with shining leaves.

These two varieties form the chief subdivisions of the species, and are marked by a difference of habit as well as colour;
lour; and it is remarkable that *R. collina* and *R. sarmentacea* are not unfrequently to be observed of a habit somewhat intermediate between these varieties; so that if at first sight the young botanist should doubt whether he has the waxy or shining-leaved variety of *R. canina*, it is highly probable that a closer investigation will prove it to be one or the other of those species.

*γ. glandulifera.* Peduncle, receptacle, and calyx furnished with glands, or rather with weak setæ, which are most abundant on the latter.—Near Potter’s Bar, Hertfordshire; at Pound’s-Bridge, near Penshurst in Kent; near Ambleside in Westmoreland. Mr. Borrer gathered a Rose nearly resembling these specimens, and which must be referred to this variety, but with the calyx-leaflets narrower and less divided, at the Pass of Lanrick.

*δ. Branches, stipulæ, and petioles of a vinous red.* Not rare in hedges and bushy places, generally in a barren soil.

*ε. Receptacle subglobose; leaflets ovate, or lanceolato-ovate, acute, with very little appearance of the small twisted acumen.* This Rose certainly does not accord well with the other varieties of *R. canina*: the shape of the leaflets, and their very irregular glandular serratures, united with the general habit, would almost justify an observer in attributing it to *R. collina*; and with this notion the subglobose fruit is not inconsistent; but the petiole veins and inferior surface of the leaflets are entirely without hairs. In some respects it resembles *R. surculosa*; but the leaflets are not flat, and the aculei of the petioles are rarely more than falcate. Near Tunbridge-Wells.
§. simpliciuscula. Calyx-leafits nearly simple. A slight difference in the general habit induced me to gather this plant when I observed it near Betchworth in Surrey; but I did not then notice the character by which I now distinguish it.

Among the British Roses with uncinate prickles and leaves entirely without pubescence, *R. canina* may be distinguished from *R. sarmentacea* by the simple serratures; from *R. surculosa* by its carinate leaves, and by the weak and slightly-hooked prickles of the petioles; from *R. arvensis* by its distinct and woolly styles. *R. sempervirens* is in habit and even in family quite a distinct plant; yet it is difficult to express any decided marks of difference, except in the styles, which, though sometimes slightly porrect in *R. canina*, are never lengthened out as in that species.

Afzelius, *De Rosis Suecanis Tent.* vili. 46, describes seven varieties of *Rosa canina*, which he considers only a portion of the number of species into which this plant must be divided. The first seems clearly to be the *R. collina* γ of this essay. The second also I should probably have enumerated among the varieties of that species, but it is remarkable for a large globular hip as large as a plum—a very uncertain mark of comparison. The third plant is *R. canina* β; the fourth, *R. canina* γ; the fifth, *R. canina* α; the sixth appears to belong to my *R. surculosa*. *R. rubifolia* of Villars is quoted under the seventh of this list of Roses; but Dr. Afzelius does not seem to be of opinion that the Swedish Rose is of the same species as that of Dauphiné; the former is perhaps rather the *R. canina* δ of this essay. Besides these, he mentions many other Roses of this tribe as existing in his collection, which not having seen alive he does not venture to describe. The various appearances of this Rose are therefore probably as numerous in Sweden as in this country.

Desvaux,
Mr. Woods on the British Species of Rosa.

Desvaux, *Journal de Botanique*, ii. 114, has no less than twenty-one varieties which he attributes to this species; but in respect to some of them he is certainly mistaken: his β is the α of this essay, and γ is the β; while his α seems to be intermediate, or rather to apply equally to either when the first appearance of the young leaves is passed off; δ seems to be my *R. collina* γ, and ε *R. collina* α; γ perhaps is to be referred to *R. canina* ε; η must be placed with my *R. canina* γ; and the author has borrowed from Lejeune, and, as he says himself, without understanding it: i, x, λ, I suppose all to belong to *R. canina* γ of this paper; μ is *R. tomentosa*, adopted from the botanists of this country. The description of the aculei might indeed mislead Desvaux; but he must be totally ignorant of our plant, as in the essential character of the species he describes the serratures simple: ν, ξ, are to be attributed to *R. dumetorum*; ο probably to *R. collina*; and here also I should put π, ε, σ, τ: ν is *R. canina* β; φ may be *R. canina* γ: but all these references must be considerably uncertain, as the descriptions are very short; and it is not at all improbable that one or two of them ought to be quoted as *R. surculosa*. I have detailed them chiefly to show the extreme uncertainty which exists as to this species. Of the twenty-one varieties, there are at the most only ten which appear to me to belong to *R. canina*, and some even of these are very doubtful.

A conserve is made from the hips of this Rose, and probably of all those which have been hitherto confounded with it, which, as Sir J. E. Smith justly observes, would be brought to table as a sweetmeat if it were not in such frequent use as a vehicle for medicines. It is sometimes met with on the tables of the Continent. The Tartars, according to Pallas in the *Flora Rossica*, drink instead of tea a decoction of the shoots and especially of the roots of this plant: this beverage has been adopted by some of the Russians, particularly in Siberia, who highly praise the agreeable and exhilarating...
larating effects of it. The Russians of the Volga prepare a spirit from the flowers; they likewise preserve them with sugar and honey. The leaves dried and infused in boiling water have been recommended as a substitute for tea.


R. stylis distinctis, aculeis caulinis petiolinisque uncinatis, foliolis planis simpliciter serratis glabras.


About Albourne, Henfield, West Grinstead, and elsewhere in Sussex. Mr. Borrer. Road-side between Hayes and Bromley in Kent.

β. Surculi not so strong, redder; bush more compact; disk of the receptacle flat. Near Stoke Newington. Only one bush of this Rose has ever been observed; but the habit of the plant is very remarkable, and I had noticed it several years before I began to pay any particular attention to this genus.

The only British species which can be mistaken for *R. surculosa* are
are *R. canina*, *R. systyla*, and *R. arvensis*; and from each of these it may perhaps be difficult to give a description which shall accurately distinguish it, while in habit it is considerably different from either. From the first it may however, I think, always be known by the porrect styles, the entire pinnae of the calyx-leaflets, the peduncle almost always furnished with hairs or setae, the shape and flatness of the leaflets, and the strong and hooked aculei of the footstalk. These marks seem indeed amply sufficient, but I am afraid they are all more or less uncertain. I have never seen the glands of the peduncle extending themselves on the receptacle or calyx; in *R. canina*, when glands are found on the peduncle, they are also generally to be observed on the fruit, and still more on the calyx; but this character likewise sometimes fails. A better distinction in the living plant is found in the enormous surculi covered with beautiful blue wax, and bearing great cymes of flowers. In the most favourable circumstances it is only by accident that *R. canina* has more than four flowers. In this plant if any surculi are produced, and it is rarely without them, the observer will not often be disappointed in searching for eight or ten, and he will sometimes find double that number; but even this mark is not very decidedly exhibited in the variety β, which seems however to unite better with this species than with any other. From *R. arvensis* it may be known by the styles, which are here hairy and but just protruded, not smooth and collected into a long cylinder, as in that plant. It is also a much more upright plant, the surculi being rather erect than decumbent. From *R. systyla* also a due attention to the styles will distinguish it; and the shape and flatness of the leaf give a decidedly different appearance to the present plant.
25. **Rosa systyla.**

**R. stylis unitis, receptaculis oblongis, aculeis uncinatis subæqualibus surculorum confertis, foliolis simpliciter serratis.**

**R. systyla.** *Bastard Flore d'Anjou,* as quoted by *Desvaux,* *Journ. de Bot.* ii. 113.


At New-Timber, Henfield, and many other places in Sussex abundantly. Mr. Borrer. At Walthamstow and Quendon in Essex, and at Clapton in Middlesex. Mr. E. Forster. At Donnington-Castle in Berkshire. Mr. Bicheno. Near Penshurst in Kent, and near Hornsey in Middlesex.

β. Leaves entirely smooth on both sides.

I cannot hesitate in referring to one species the synonyms above quoted. *R. brevistyla* and *R. leucochroa* are said to differ in having a shorter column of styles than *R. stylosa*; but this circumstance I have
I have observed to vary considerably. *R. debracteata*, Lam. et Dec. *Fl. Fr.* vi. 537, ought also probably to be referred to this species: it has the styles connected, and differs from *R. arvensis* in its greater size and upright stem. The "flore d'Anjou" of Bastard I have not been able to meet with, I therefore trust to Desvaux: but the character of the plant is so distinct, as applied to a Rose having nearly the habit of *R. canina*, that there can be no doubt of the accuracy of the reference. Desvaux has thought proper to alter the name; but I have preferred retaining that originally proposed by Bastard, not only as being prior to the other, but also very decidedly better. The name in English *Botany* was given with the idea that this species coincided with the *R. collina* of Jacquin; from which, however, it may readily be distinguished by its elegant habit, cup-shaped flowers of a much more glowing hue, long fruit and peduncle, narrow bracteae, and above all by its connected styles, which separate it from all Roses of the *canina* family. The difference in the size and strength of the aculei of the branches compared with those of the surculi may sometimes also be a useful character. The habit of *R. systyla* will to the practised eye keep it abundantly separate from *R. arvensis*. In artificial character they are more nearly allied; but in *R. systyla* the surculi, though weak and gracefully bending, rise upwards, unlike the long, rambling, decumbent shoots of *R. arvensis*: they are also thickly covered with large prickles; whereas those of the latter Rose have the aculei neither very large nor very numerous, but rather the contrary.

In some states this is a Rose of no very conspicuous appearance; but when it produces its root-shoots long and gently curved downwards by the weight of the numerous clustered flowers, it is hardly possible to conceive any thing more beautiful.
Mr. Woods on the British Species of Rosa.


R. stylis unitis, aculeis uncinatis surculorum sparsis, foliolis ellipticis inaequaliter serratis.


R. canina β. Fl. Germ. i. 218. & ii. 360.


R. sylvestris minor flore albo. Raffi Syn. 455.


Hedges and bushy places in the southern and midland counties; rare in the mountainous districts.

β. Fruit glandular as well as the peduncle. At Shermanbury in Sussex. Mr. Borrer. By the high rocks at Tunbridge-Wells.

Mr. Borrer has communicated to me specimens remarkably long in the leaves and fruit. This approaches in some degree to
the \textit{R. prostrata}, Lam. et Dec. \textit{Fl. Fr.} vi. 536, which seems to be a variety of this species with shining persistent leaves; but the latter circumstance has not occurred to me in any English specimen.

This Rose has hitherto been separated from its nearest affinities on account of the shape of the fruit: but this has been done erroneously; for though the full-grown fruit is sometimes nearly globular, the receptacle, while the plant is in flower, is decidedly ovate, except occasionally in starved specimens: it is generally longer in the cymes of flowers than when solitary, differing in this respect from \textit{R. canina} and its allies, which have usually among the cymes rounder receptacles than those of the solitary flowers.

The midrib of the leaflet is sometimes furnished with hairs: this peculiarity will occasionally occur on some branches and not on others of the same plant.

The habit of this Rose is a low bush with long trailing shoots frequently covered with a profusion of flowers opening quite flat. The buds are faintly tinged with red, but the expanded petals are I believe always white. Mr. Sabine has what he considers as a double variety of \textit{R. arvensis}, which retains the blush colour in the flowers, and is extremely beautiful. In this the serratures of the leaves are furnished with glands which have the appearance of double serratures, as in \textit{R. provincialis}, \textit{R. gallica}, \textit{R. damascena}, and \textit{R. alba}.

In the long shoots of this plant the aculei frequently appear to consist of a short mucro on an expanded base. As the ramifications are repeated, it often happens that the expanded base diminishes in proportionate size, and the mucro becomes a hooked prickle more round and slender than in the family of \textit{R. canina}; the smallest prickles are even sometimes quite straight.
Mr. Woods on the British Species of Rosa.

The distinct, smooth, lengthened column of styles is alone sufficient to distinguish it from every British Rose except *R. systyla*, from which it may be known by its decumbent shoots and expanded flowers; the leaflets also are flatter, the serratures wider apart, and the whole plant of a grayer colour. When once known, their general appearance is so different that it is impossible to confound them. Among the exotics, *R. sempervirens* comes near to it in habit, while in essential character it is easily separated by its shining leaves and villous styles. *R. sempervirens* of Roth, *Fl. Germ.* i. 218. ii. 556; *R. umbellata* of Gmelin, *Fl. Bad. Als.* ii. 425; *Lam. et Dec. Fl. Fr.* vi. 532, appears to me a very different species: it is not an evergreen; the fruit is globose or nearly so, and the leaves are doubly serrated and glandular beneath. Gmelin *l.c.* remarks that it is allied to *R. Eglanteria*. It is perhaps as near to *R. Borreri* as to any British Rose; but it is scarcely possible to conceive how this could have been mistaken for t. 246 of the *Hortus Elthamensis*, the only plate referred to by Linnaeus, and clearly pointing out his plant.

*R. semperflorens* is another plant of this family, and, unless the distinct styles of these Roses should make it necessary to separate them, *R. indica*. It will also contain *R. moschata*, *R. multiflora*, and *R. sinica*. Some Roses from China, of which specimens exist in the Banksian Herbarium, will probably form another family allied to this.

The hip of this species has a finer flavour than that of any other British Rose; that of *R. systyla* does not much differ in this respect.

Read January 21, 1817.

Notwithstanding the assiduous labours of so many acute and learned men in the field of Botany for three centuries past, much still remains to be done in the mere determination of species. All our care and watchfulness are still requisite, to keep the science clear of confusion, even in the history and discrimination of European plants. No accurate and scientific student will find any want of employment, or of well-deserved credit, in the exclusive cultivation of this field. The more familiar the plants, the less carefully have they, often, been studied, and the more numerous their synonyms, the greater is the chance of accumulated and intricate mistakes. Those who are competent to devote themselves to this branch of scientific inquiry, will wisely avoid all loss of time about matters of opinion, concerning which, men more learned and experienced than themselves have differed, but which are in general sufficiently settled for all practical uses, though they might be debated upon for ever, without any incontrovertible conclusion. Such are many of the genera in dispute between Linnaeus and other authors; in alluding to which, I by no means wish to deter young botanists from the study of genera, one of the most instructive that they can pursue. But to learn and to teach are very different things. I cannot too often protest against those more tempting roads to immortality, gratuitous changes.
changes of names, and speculations in classification. The former can only be permitted, if at all, to the most eminent leaders and reformers of botanical science, who may be capable of acquiring supreme authority in the latter.

The writer of this paper has never thought himself more directly pursuing the best objects of that Society, now so eminent, and so extensively useful, to whose service he has so long been devoted, than when employed in those practical investigations and criticisms, by which its “Transactions” are particularly distinguished. These subjects are so far from being exhausted, that scarcely any considerable genus of plants could be taken at random out of the Linnaean herbarium, without affording matter for an ample dissertation.

The genus *Tofieldia* is known to have been involved in much confusion, as to its name and character; but no one seems aware of the still greater confusion, and intricate misapprehensions, which concern its species. I shall attempt to unravel both these subjects.

The late Mr. Dryander has well pointed out, in the second edition of Mr. Aiton’s *Hort. Kew. v. ii*. 324, that our present *Tofieldia* was the real and original *Anthericum* of Linnaeus, in his *Genera Plantarum*, ed. i. 106. Accordingly it there stands in the *Hexandria Trigynia*. But in the second edition of the same work, published five years afterwards, the author combines, or rather confounds, with this genus his own *Bulbine*, *Gen. Pl. ed.* i. 95, as Tournefort had done before him. In the first edition of the *Species Plantarum* therefore *Anthericum* is a most heterogeneous assemblage; and so it continued in all the subsequent publications of the great Swedish botanist. Some things have been done in England still further to embroil, and some to reform it. The *Hortus Kewensis*, and Mr. Brown’s *Prodromus*, stand eminently
nently conspicuous among the works which have conduced to the latter object. Their authors have, in this instance, wisely exercised that discretionary paramount authority, which belongs only to the leaders in Botany, of overruling a prior claim of nomenclature. Instead of setting up the original *Anthericum*, they have retained that name for the numerous species to which it is popularly applied, and which make the bulk of the genus as Linnaeus and his followers have subsequently understood it. Hence a very troublesome degree of perplexity is avoided; especially as these writers must otherwise either have invented a new name, or have restored *Bulbine*, already differently applied by Gaertner. They certainly knew better than to take up with Tournefort's *Phalangium*, which is appropriated to a genus of insects.

The author of the *Flora Britannica* indeed, aware of the above-mentioned confusion and pretensions respecting *Anthericum*, had exercised the same discretionary power, following Mr. Hudson in his name of *Tofieldia*. Under this is commemorated Mr. Tofield, a country gentleman in the neighbourhood of Doncaster, who there discovered the *Vicia bithynica*, a plant which had escaped the notice of Ray and the botanists of his time, though since observed in other parts of England. The herbarium of Mr. Tofield came, in 1793, after his decease, into the possession of Dr. Younge of Sheffield, F.L.S.

Jussieu, led by Gerard, has transferred Moering's name of *Narthecium* to our *Tofieldia*; from an idea, as it appears, that the real *Narthecium* of that author belonged to this genus, though nothing can be more distinct. We believe it to be no less distinct from *Anthericum*, though retained in that genus, after Willdenow, in the *Hortus Kewensis*. The able M. Decandolle, not wishing perhaps to clash with Jussieu, has called this last plant
plant Abama; but the prior right of Narthecium, published in 1742, is irrefragable.

The genus whose illustration is the object of the present disquisition, may therefore be considered as now established beyond the reach of controversy, under the following name and characters.

**Tofieldia.**


**Char. Nat.**

Cal. Perianthium inferum, remotiusculum, monophyllum, membranaceum, tridius, parvum, persistens.

Cor. Petala sex, oblonga, concava, æqualia, patentia, persistens, calyce multoties longiora.

Stam. Filamenta sex, petalis opposita, subulata, simplicia, glabra, longitudine corollæ. Antheræ incumbentes, cordato-subrotundæ.


Peric. Capsule tres, basi connexæ, gibbosæ, carinatae, membranaceæ, uniloculares, bivalves, intus præcipuè dehiscentes.

Sem. Numerosa, elliptico-oblonga, angulata, valvularum margini internæ utrinque inserta.
of the Genus Tofieldia.

Narthecium, which agrees most in habit with the genus before us, is distinguished from it by the want of a calyx; as well as by having a simple germen and single style; hairy filaments; and a membranous tunic, tapering at each end, to the seeds. Anthericum, including the Phalangium of Tournefort and Jussieu, differs from Tofieldia in having no calyx; a simple germen and style; and angular seeds. Helonias, to which Willdenow refers our T. palustris, confounding under that solitary species nearly the whole genus, has a simple germen and capsule, though three styles; very few seeds in each cell; and wants the calyx.

The species of Tofieldia have hitherto been even less understood than its generic characters, as the following exposition will show.

1. T. palustris, capitulo ovato, caule glabro filiformi aphyllo, petalis obovatis obtusis, germinibus subrotundis.


Narthecium pusillum. Michaux Boreali-Amer. v. i. 209.


Native of the black boggy margins of pools and trickling rills, on the mountains of Lapland, Scotland, Durham, and North America, particularly lake Mistassins, flowering from June to August.

This is a perennial herbaceous plant, of humble stature, entirely smooth in every part. The root is horizontal and somewhat tuberous, or woody, but slender, with very long, tough, white, zig-zag
zag fibres. **Leaves** composing numerous radical tufts, dark green, equitant, sword-shaped, ribbed, two inches long. **Stem** erect, from four to six inches high, solitary, simple, round, quite smooth, naked; triangular at the base, where it often bears one small leaf, not rising above the others. **Flowers** pale green, very small, in a little oblong, obtuse, generally very dense head, from a quarter to half an inch in length. The partial flower-stalks are entirely wanting, the calyx being crowded close to the main stalk, with hardly any perceptible bractea. The base of the flower within the calyx is however elongated, assuming, as the fruit advances, the appearance of a thick stalk, swelling upwards, half a line in length. **Calyx** very deeply divided into three acute segments, small, membranous, and whitish. **Petals** hardly a line long, obovate, generally quite obtuse, concave, greenish-white, longer than the stamens. **Germens** combined into a nearly globular form, with three furrows. **Styles** extremely short, spreading, with abrupt, slightly capitate, stigmas. **Capsules** converging, roundish-obovate, each about the size of mustard-seed, obtuse, with a minute spreading point crowned by the **style**.

Such is the original Lapland plant of Linnaeus, exactly agreeing with specimens from Scotland and the county of Durham, as represented in *Engl. Bot.*, and answering precisely to the *T. pusilla*, adopted by Pursh from Michaux. With this has all along been confounded a Swiss species, which we are next to describe, and which is the only plant known to botanists of the South of Europe as the Linnaean *Anthericum calyculatum*. Dillenius caused this confusion, as appears by the *Flora Lapponica*; where Linnaeus, who strongly suspected these two plants to be different, but never, to the day of his death, saw more than one of them, was induced by his learned correspondent to consider them as varieties of each other.

2. T. al-
2. *T. alpina*, racemo cylindraceo, bracteis pedunculo subæqualibus, caule glabro diphyllo, petalis obovatis, germinibus oblongis.


*Anthericum n.* 1205. *Hall. Hist.* v. ii. 98; excluding the synonyms of Mæring and Gorter.


*Pseudo-asph. quibusdam*. *Bauh. Hist.* v. ii. 634; the description, not the figure, which represents a *Pancratium*.

*Asphodelus Lancastriæ verus*. *Ger. Em.* 96.

Very common in moist grassy pastures on the alps of Europe, throughout Austria, Switzerland, the south of France, and north of Italy, flowering in August. Scheuchzer says it grows on the shady dry ridges of hills, and he therefore wonders at Tournefort’s epithet of *palustris*. I have gathered this plant in the boggy margins of alpine rivulets, on the plain of mount Cenis. Seguier, Villars, and Allioni speak of it as an inhabitant of rich, moist, or spongy soils, among grass. Notwithstanding what is said in Gerarde’s Herbal, there is no authority for its ever having been found in Britain.
This species is, in every part, twice the size of the foregoing, of which it has, till now, been considered as a variety, whose greater luxuriance, or more dilated habit, was attributed to its situation in a more favourable climate. Into this error I have been led in the *Flora Britannica*, where therefore a number of erroneous synonyms are accumulated; but the description belongs precisely to the *T. palustris*, except perhaps what regards the *bracteas* and *fruit*. So much are we frequently disposed to see with the eyes of others, that it was not before I had compared the figure in *English Botany* with that of Redouté, both cited together in *Hort. Kew.*, that I was obliged to correct my opinion. After making all imaginable allowance for possible inaccuracy in the two artists, however excellent; and for the one plate being taken from a wild specimen, the other from a most luxuriant garden plant; nothing seemed to justify a conclusion of their belonging to one species. A more close examination of the plants themselves immediately removed all uncertainty. Besides the difference of size, as above mentioned, the *root* of what I have now named *T. alpina* is much thicker in proportion, and more woody. The *stem* bears two distant *leaves*, of which the uppermost especially is much smaller than the radical ones, and if situated more than half way up the stem, it diminishes in proportion. But the most satisfactory differences exist in the *flowers*. The *inflorescence* is a *cluster* (*racemus*), from one to two inches long, frequently interrupted or scattered. The *partial stalks*, though short and thick, are always distinctly present, having a concave permanent solitary *bractea*, about their own length, at the base; and as the *fruit* advances they become more evident, a line or more in length, and curved upward. The *calyx* is close to the rest of the flower, cup-shaped, unequally and rather slightly three-
of the Genus Toßeldia.

three-cleft. Petals rather more yellowish, scarcely so long as the stamens. They are represented too narrow and acute in M. Redouté's figure. Capsules combined almost all the way up, making together a roundish-elliptical three-lobed figure, larger than a coriander seed, of a light brown, transversely corrugated, their points widely spreading, crowned with the short thick styles, and capitate stigmas. The seeds are extremely numerous. The wooden cut of the old authors above cited, is quite as expressive as the copper-plate of Seguier, commended by Villars, and copied by Lamarck.

3. T. stenopetala, racemo cylindraceo, bracteis calycem superantibus, caule glabro diphylo, petalis lanceolatis acutis.

Gathered by Kalm in North America, but in what part we are unable to determine. Three of his specimens are preserved in the Linnaean herbarium.

This, which Linnaeus did not distinguish from his Anthericum calyculatum, is most akin to our Toßeldia alpina, with which it accords in size and habit, as well as in bearing two, sometimes three, alternate distant leaves on the stem. The inflorescence is a dense obtuse cluster, one inch and a half long, interrupted in the lower part. The bracteas however afford a clear specific difference, being lanceolate, and extending not only to the summit of the short and thick partial flower-stalks, but often reaching much beyond the calyx, which latter is very broad and shallow, unequally three-cleft, sometimes with a few supernumerary teeth or notches. The petals are very different in shape from both the preceding species, being lanceolate and acute. Their colour seems a greenish white. Anthers pointed. Germens ovato-lanceolate. Styles twice as long as the last.

Tab. VIII. Fig. 1 represents a dried specimen of T. stenopetala, of the natural size, with the separate parts of fructification magnified.


A. n. 39. Gmelin Sibir. v. i. 73. t. 18. f. 2; the synonyms altogether erroneous.

Native of mountainous woods, near the river Lena, in Siberia, flowering about the end of July. Specimens in flower and fruit, sent by Gmelin, are preserved in the Linnæan herbarium; and we find with astonishment that when the first edition of the Species Plantarum was written, they were confounded with the genuine Lapland Anthericum calyculatum, even by Linnæus himself.

The present most distinct species is as different from T. palustris as two plants of one natural genus can well be. It is more akin to our second and third species, with which it accords in general aspect, but the roots are of a more creeping nature, and the stem is taller, a foot or more in height, quite leafless, except at the very base, cylindrical throughout, glaucous in the upper part. Leaves narrow, near three inches long, with a small oblique point; their edges rough toward the extremity. Cluster erect, many-flowered, from two to four inches in length, rather lax, but scarcely interrupted. Partial flower-stalks nearly horizontal, slender, angular when dry, quite smooth, about one eighth of an inch long, and as the fruit advances becoming still longer. Bracteas solitary at the base of each stalk, and about a quarter as long, ovate, keeled, a little recurved. Flowers white, drooping, about twice the size of Convallaria bifolia. Calyx dilated, with three shallow,
of the Genus Tofieldia. 245

shallow, obtuse segments. Petals obovate, obtuse, slightly pointed, concave, the length of the flower-stalks, and keeping pace with them in their subsequent elongation, when the petals become very narrow at the base. Stamens shorter than the corolla; the anthers, according to Gmelin, yellow. Germens and styles much like T. stenopetala. Capsules quite pendulous, shorter than the permanent corolla, obovate, very thin and brittle, combined nearly all the way up, but easily separated, each crowned with a straight spreading style, and capitate stigma. Seeds very numerous, small, slender, prismatic.

Gmelin mentions, on the authority of Steller, a variety with leaves upon the stem, which we should suspect to be a different species; but without seeing specimens, we can determine nothing respecting this point.

5. T. pubens, racemo cylindraceo interrupto, pedunculis fasciculatis scabris longitudine corollæ.

Narthecium pubens. Michaux Boreali-Amer. v. i. 209.
Melanthium racemosum. Walt. Carol. 126.


Having no specimen of this, I postpone its description, till I can examine the Banksian herbarium. It makes the last of five species, which have been confounded together under the Linnaean Anthericum calyculatum.

6. T. glu-


Native of North America, from Quebec to lake Mistassins, according to Michaux. Our specimen was gathered by Mr. Menzies, on the west coast of North America, and is the same with what Mr. Pursh saw in the Banksian herbarium. We have no reason to suspect the plant of Michaux to be different. He says it has "the habit of the Linnean *Anthericum ossifragum*," and that "the spike consists of a few alternate *fasciculi*; the capsule is ovate, twice as long as the calyx." By *calyx*, he means *corolla*, and by *spica, racemus*, as is evident from the rest of his account. Mr. Pursh therefore is inaccurate in copying his phraseology, which contradicts his own generic character of *Tofieldia*.

Mr. Menzies's specimen has a thick tuberous horizontal *root*, with long simple brown fibres, being undoubtedly perennial, like the rest of the genus. *Stem* erect, a foot high, angular, at least when dry, roughish all over with short glandular hairs; more densely hairy for the space of two inches from the top, where it bears a small leafy *bractea*, possibly not constant. *Leaves* rather few, all radical, except one or two on the very lowest part of the stem, which do not rise above the others; they are all erect, four or five inches long, narrow, ribbed, bright green, smooth, except a slight roughness towards the point. *Cluster* scarcely an inch in length, ovate, obtuse, of twelve or fourteen flowers, on hairy *stalks*, sometimes in pairs, hardly a quarter of an inch long, erect or slightly spreading, having at the base one or two membranous acute *bracteas*, one-third their own length. *Calyx* not deeply lobed. *Petals* yellowish, obovate, about as long as the flower-stalks.
of the Genus Tofieldia.


Having seen nothing of the capsule, we cannot compare it with Michaux’s description.

This is unquestionably very different from the *Narthecium glutinosum*, described by Mr. Gawler in *Curt. Mag.* t. 1505, the latter being a real *Narthecium*, called by Pursh *N. americanum*; see his *Flora*, p. 227.

**Tab. VIII.** Fig. 2 is taken from Mr. Menzies’s specimen of *T. glutinosa*. A, *Calyx* magnified, with its *flower-stalk* and *bracteas*. B, *Petal*. C, *Stamen*. D, *Germens* and *styles*.

Norwich, Jan. 20, 1817.

J. E. Smith.

*Read February 4 and 18, 1817.*

The male and female *Paeonies* of Theophrastus, Pliny and Dioscorides are ascertained to be the plants that were known by those names after the revival of letters. Clusius, of the sixteenth century, seems to have been the first who made any addition to these. That truly original writer describes the plants he saw during his travels with a clearness which, considering the infant state of science at the time, deserves more praise than seems to have been bestowed on him. A number of botanical authors towards the close of the sixteenth and throughout the seventeenth century, chiefly copying him and each other, increased the catalogue; but their descriptions are in general so ill defined, and so replete with inaccuracies, that much information cannot be obtained from them. John Bauhin and our countryman Morison are the principal writers, after Clusius, who can be depended upon, till the days of Linné; and his opinions upon *Paeonies* were singular and erroneous.

In the *Hortus Cliffortianus*, his earliest publication, in 1737, he discloses doubts on the subject by observing underneath *P. officinalis*—"*Qui considerat notas essentiales structuramque plantae, non potest non palpitate vastum istum apud authores numerum, non nisi meris varietatibus constare.*" He afterwards makes up his mind; and in the first edition of *Species Plantarum* reduces all the *Paeonies*
nies into one species, with this sweeping remark, "Limites inter species non reperi, hinc conjunxi." Retzius, his pupil, the first who questioned the correctness of this opinion, makes the following just observation thirty years afterwards: "Genus Peonia nimis contraxit illus. a Linné, character specierum utique difficilis non tamen impossibilis. Si Peonia anomala pro distincta haberi debet specie, non video cur ni etiam reliqua, nec mihi persuadere potui omnes ab una productasuisse. Si vero quis aliter sentiat, per me licebit; tunc vero bine tantum statui debent Peonia species, Officinalis nempe et Tenuifolia. Memoratas species sepius e seminibus educavi semper sibi similis." The truth of this is confirmed by all our experience; for the seedling plants preserve uniformly, as far as we have observed, the habits and characters of their parents. But there is great difficulty in discovering sufficient marks of distinction between them; which, however, we ought not to presume in any case to be insurmountable, though we may have failed in overcoming it in some instances.

Linne admits the newly-discovered P. tenuifolia into his second edition of the Species Plantarum, and P. anomala is described as a new species in his Mantissa; but he persists in considering the old male Peony only as a variety of the female, though they are distinguished by characters fully as opposite as those by which the two former species are distinguished from either; nor does he ever acknowledge any of those with pubescent leaves to be distinct species, although several of those found in the old authors are unquestionably genuine. But even the error of this great man has on the present occasion proved beneficial to science, by repressing that prevailing propensity among botanists to increase too much the number of species: for no writer has since presumed to take up any of those rejected by him, without mature consideration and well-grounded proof.

Retzius, Pallas, and Murray are the principal botanists who
have described Paeonies with precision after Linné, and their descriptions are excellent as far as they go; but the accession of new species lately discovered, and as yet but imperfectly described, together with the necessity of a thorough revision of those that were formerly known, rendered some attempt like the present requisite. If it shall be found to possess any merit, it is not to me, but to my much esteemed friend Joseph Sabine, Esq. F.R.S., &c. that it is to be ascribed: that gentleman for several years has collected with indefatigable pains all the Paeonies he could discover both from public and private gardens. Having at length assembled upwards of seventy plants under different names in his garden at North Mimms, he began, by comparing them together, to produce order out of confusion. It was at his particular invitation that I first attempted to describe them; and it has been by the assistance of his information that I have been enabled to proceed in the undertaking. I have, therefore, to avoid the necessity for reiterated acknowledgements, taken the liberty of employing the plural number, as including him, in the composition of the following account.

I do not enter into any examination of the general character, further than to repeat what has been hinted by others; that the genus properly belongs to Polyantrria Trigynia, not only because the species more generally exhibit three pistilla than any other number, but also because this is its most natural position: it should stand, in my opinion, between Aconitum and Homalium in the factitious arrangement. The germina tomentosa, will now be expunged from the natural character, there being two species with smooth germens.

The descriptions are made out from an actual examination of each living plant; and it affords no small satisfaction to say, that very few if any of the plants taken notice of up to the present time remain unaccounted for: a few, indeed, which appear to be questionable,
questionable, are noticed as such in their proper places. I have rejected many synonyms of the old authors, from motives of caution: but I am inclined to believe that every species enumerated by them refers to some one or other of the plants here recorded.

It was deemed necessary to be more particular in describing the varieties than is customary in a scientific paper; not only because some of these may hereafter turn out to be distinct species, but also with a view to render the tract useful to cultivators as well as to botanists; and by referring each plant at present known to the old authors, in all cases in which they can be followed, to guard in future, as much as possible, against the confusion which their inaccuracies have produced.

I have rejected the *folium ternatum* in the specific characters, as being common to the whole: and for the same reason I have avoided in the descriptions the repetitions of such terms as *caulis uniflorus*, *caulis angulatus*, *petioli supra canaliculati*. The number of stamina is also omitted, as being very indefinite.

There are two parts, however, in the organization of the Pæonies, which appear to me to deserve more attention than has been paid to them; but they attracted my notice when it was too late for me to avail myself of them: viz. the shape and number of the stipulae attached to the caudex, and the form and structure of the perigynous substance which belongs to all the species. These may perhaps hereafter form important objects for specific distinction.

All the species hitherto known are confined to the northern hemisphere, and no one has yet been found in any part of America. They belong to cold climates. Some species indeed are indigenous in the south of Europe; but they grow upon elevated situations. They are, as far as has yet been tried, sufficiently hardy to stand our winter unprotected.
Mr. Anderson's Monograph of the Genus Paeonia.

**Paeonia Synopsis Specierum.**

1. *Moutan.*

P. caule fruticoso, foliolis distinctis summo apice trifidis, germinibus tomentosis urceolo membranaceo inclusis.


Radix ramosa. *Caulis 4-pedalis, lignosus (medulla crassa), ramosus, cortice rugosisusculo, fusco. Ramuli annotini simplices, alterni, pedunculis unifloris deciduis terminati, basi stipulis numerosis cucullatis vaguantibus utque. Petiolii longissimi, glabri, atropurpurei, axillis nigrificantibus, Folia biternata, foliola plana, ovata, basi obtusa, interdum obliqua,

A minute account of this species is given in the Mémoires des Chinois by the Missionaries, Paris 1778: from whom we learn that it is the pride and glory of the Chinese, who have cultivated it by their own accounts for upwards of 1400 years; and its varieties, from two to three hundred in number, are cherished with no less consideration than the Dutch florists do their tulips; and that it is a theme for their poets and painters, and prized even by their emperors, not only on account of the beauty but of the sweet perfume of its flowers. The colour of these is represented to consist of different shades of purple, crimson, violet, rose, yellow, white, black! and blue. Their tradition of its first origin is of its being discovered by a traveller on the mountains of Ho-nan: no notice is taken of its being now found there, or any where else in a state of nature; and Loureiro and Thunberg only describe it as being every where cultivated in the gardens of Japan and Cochinchina.

The Chinese take credit for rendering it a shrub by means of their superior art in gardening, for which they plume themselves greatly. It is possible that they might mistake P. albiflora, which is found in China, for the original state of this plant. At this we need not wonder, when two European botanists mistook it for P. officinalis. We cannot for a moment doubt of the shrubby stem being natural, although it bears a strict analogy to the subterraneous
terraneous caudex of the herbaceous plants, of which it seems to be nothing more than a prolongation, each annual shoot being simple and subtended by numerous vaginal stipulæ, which in those rise only to the surface of the ground, and are not wanting in any of the species. The membrane too which envelops the germens, and which some botanists have suspected should remove this plant to a new genus, is only a more extended example of the truly perigynous crown which surrounds the base of the germens in all the Pæonies.

The seeds are represented as being black; we have not seen them matured: its leaves are not shining as in albiflora, nor are they totally divested of pubescence. The woolly germens would sufficiently distinguish it from that species, though all the other marks were removed.

*a. papaveracea*; petalis 8—13, albis, basi macula purpurca notatis.


Introduced by Sir Abraham Hume, about the year 1806, from China. This should be considered as the type of the species, the other varieties having double flowers. Its capacity to stand the rigour of our climate is not as yet sufficiently tried, being still too rare and valuable to risk with the full experiment; but we think it will prove to be hardy. Its petals are white, very broad and large, obcordate, with a blotch of deep purple at the base of each. The membrane that surrounds the germens is more entire in this than in the other varieties, the united mass of germens is ovato-spherical, and more tapering at the apex than the capsule of the poppy, with only a small orifice at the top to let out the stigmas, which are reflexed and form a star of bright purple: these, with
with the petals, produce a contrast of fine colours seldom to be equalled in one flower.

\( \beta. \) Banksii; foliolis apice fissuris obtusis, floribus plenis, petalis medio rubicundis.


Introduced in 1789 by Sir Joseph Banks; the first of the species that appeared in Europe, and which has hitherto been found the most hardy.

The leaves of this variety are more obtuse than those of *papaveracea*, not so glaucous on the under surface, and darker green on the upper: these, however, are only distinctions of comparison. Calyx composed of eight or ten leaves; corolla of twenty to thirty petals, very large, nearly white in the margin, with an indistinct streak of dull purple along the middle.

\( \gamma. \) rosea; foliolis apice fissuris obtusissimis, floribus subplenis, petalis roseis.


This variety was introduced about the year 1794 by the late Right Hon. Charles Greville into his garden at Paddington: it is more tender than the preceding; and has no other claim for preference to it, but in respect to its smell, which is very fragrant, not unlike that of the rose: the flowers, when weak, are frequently almost single; petals rose-coloured; leaves more pale; leaflets broader, more obtuse, and smoother on the upper surface than those of *Banksii*, and the buds push out in the spring of a more ruddy hue.

We may expect new varieties of this interesting species from China.

2. *Paeonia*
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2. Paonia albilora.

P. caule subtrifloro herbaceo, foliolis ovato-lanceolatis confluentibus laciniatis, germinibus glabris, floribus erectis.


We had almost persuaded ourselves that Besler’s two figures in Hort. Eyst. Plant. Vern. ordo vi. no. 12 & 13, belonged to this species;—but what can we say for an author’s accuracy, who delineates P. officinalis with a divided stem supporting two flowers?

Native of a vast range of latitude, from the northern regions of Siberia down to the dominions of China. Pallas found it in Mongol Tartary, and on the borders of Lake Baical. Its roots, he says, are used as an article of food by the Tartars, and the seeds reduced to powder mixed with their tea. Discovered also on Mount Caucasus, and in Georgia on grassy hills.

In proportion to the diversity of climate it is found to vary in form and stature. We have in vain endeavoured to discover any fixed
fixed marks of distinction between the nine plants enumerated below, and are obliged to conclude that they all belong to one original species. In their relative connexion, the three double varieties from China are the furthest apart, yet they differ from the others only in degrees of comparison; in the essential points there appears to be no discrepancy whatever. This species is distinguished from anomalá, with which only it can be confounded, by its erect flowers, more obtuse foliage, and above all by its having more than one flower on its stem, a property possessed by no herbaceous Paeony but itself. Nor ought we to omit mentioning the seed, the uniform brown colour of which is peculiar to this species, and serves materially to confirm our opinion, those of all the other herbaceous species being black when ripe.

\[ \text{P. albiflora.} \quad \text{Andr. Repos. 64, bona.} \]

This variety, obtained by Mr. Sabine from Messrs. Lee and Kennedy under the name of albiflora, perhaps more common among our gardens than any other, is to be distinguished by its white eight-petalous corolla, rarely and slightly tinged with pink at the base. Cymes of two or three flowers; the middle flower is the strongest, the earliest, and always the shortest. This observation indeed applies to most of the species. Leaves broader, more flat and shining; and these and the stem, together with the peti-oles, are altogether of a darker hue than most of the others. The stigmas are of a dull yellow.

\[ \beta. \text{candida; foliolis latioribus planis saturate viridibus, corolla pal-} \]
\[ \text{lide carneae octo-petala, stigmatibus carneis, caulibus bifloris.} \]

Mr. Sabine found this variety at Mr. Knight’s nursery, in the King’s-road. He had it from the Liverpool botanic garden under
the name of *sibirica*; but it is not the plant which generally gets that name; and it differs from the foregoing in having its leaves and stalks less of a purple hue, in its disposition to have fewer flowers on the cyme, and in the stigmas being flesh-coloured instead of yellow. The plant too seems weaker. The flowers of this as well as the foregoing go off white (a florist’s term); but this has rather a greater dash of pink in its opening corolla.

γ. *tatarica*; foliolis latioribus planis purpurascensibus, corolla carnea 9—14-petala, stigmatibus carneis, caulibus 2—3-floris.

*P. edulis.* *Paradisus Londinensis,* 78.

*P. albiflora.* *Botanical Register,* 42.

Mr. Sabine got this variety from Mr. Biggs, who cultivated it in the botanic garden of the late Mr. Swainson of Twickenham. Another plant of the same was presented to him by Sir Joseph Banks, whose hands are always extended to promote objects of science. The original, we believe, was imported by the late Mr. Bell of Brentford, to whom we are indebted for the introduction of several *Paeonia* spp., by means of his correspondence with Pallas. It came from Tartary. Its hue, though darker, a good deal resembles that of *vestalis*; but its flowers are larger, with a greater number of petals, which retain a pale pink colour till they drop. The stigmas are of a pink colour, like those of *candida.* The figure in the *Botanical Register* is from a specimen out of Mr. Sabine’s collection.

δ. *sibirica*; foliolis concavis dilute viridibus, corolla omnino nivea 8-petala, stigmatibus carneis, caulibus bifloris.

Raised from seed by Messrs. Loddiges and Sons, and said to come from Siberia through Pallas. Leaves yellowish-green, and flowers quite white even in the bud; is altogether divested of that purple tint
tint in the stalks, leaves, and germens, so observable generally in this species. It also bears the largest flowers, which seldom exceed two on each stalk: in this we suspect, however, it is subject to vary, for Mr. Sabine observed a plant last year at Kew with a greater number of flowers, which he takes to be this variety.

*e. rubescens;* foliolis concavis angustioribus purpurascensibus, corolla rubente 8-petala, stigmatibus ochreis, caulibus trifloris.

This plant was purchased by Mr. Ronalds, nurseryman, of Brentford, at the sale of the late Mr. Bell’s collection. Sir Abraham Hume has the same plant, and we believe from the same source, under the name of *tatarica.* This is the most diminutive variety, and with flowers of the darkest colour. The leaves are small, obtuse, concave or channelled on the upper surface. Perhaps this may be the variety *γ* of the *Paradisus Londinensis* “petalis roseis.” The petals of our plant are pale red, narrow, and small; stigmas of the same colour as those of var. *α.*

*ζ. uniflora;* foliolis concavis angustioribus, corolla albicante 8-petala, stigmatibus ochreis, caulibus subsimplicibus.

*P. albiflora.* *Bot. Mag.* 1756.

We are informed by Messrs. Loddiges that they had seeds of this plant from Pallas. We observe it among the gardens about London under different names. It is to be distinguished from the other varieties by the narrowness of its leaves, and a disposition to produce only one flower on the stalk: in this particular, however, we doubt its constancy. The petals are white, slightly tinged with pink at their base. Stigmas dull yellow, like those of var. *α.*

*η. Whitlejii;* foliolis rugosioribus inaequaliter laciniatis, floribus ple-
nis carneo-albicantibus, caulibus tripedalibus sparsi subquinqe


In regard to this and all the double-flowering herbaceous va-

This beautiful plant was imported in 1808, from China, by

S. *Humei;* foliolis rugosioribus inaequaliter laciniatis, floribus


Introduced by Sir Abraham Hume, Bart. from China, through

1. *fragrans;* foliis rugosioribus angustioribus pallidis, floribus


Introduced
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Introduced from China in 1805 by Sir Joseph Banks. This variety is conspicuous in its upright slender stalks, leaves more pale, and narrower, than those of the other two double ones, scabrous, and obsoletely serrated on the margin. It flowers the latter end of June, the latest of all the Paeonies, of a pale rose-colour, giving out an agreeable scent similar to that of the rose. The central petals are longer than the others, and erect.

These varieties are hinted at by Loureiro in his Flora Cochinchinensis. He states that the Paeony is found both wild and cultivated over all the Chinese empire, chiefly in the northern provinces; and concludes, "Sunt alia multae varietates (fortasse species) quas non vidi." We may look for an increase to our acquisitions from that quarter.

3. Paeonia anomala.

P. caule uniflоро, foliolis multipartitis, laciniiis lanceolatis germinibusque glabris, flore nutante.


This
This is a most distinct and well-marked species, being endowed with one unique property, in having its flowers constantly drooping to one side. It differs also essentially from *albiflora* in being supplied with only one flower on the stem; and from all the other smooth-leaved species by its smooth germens. The earliest notice of it appears in Gmelin's *Flora Sibirica*, published at Petersburg in 1747. Though Linné does not acknowledge it in either edition of his *Species Plantarum*, it is at length admitted in the Mantissa.

Native of all Siberia, and frequent on the Altaic mountains. It was first introduced into England by the late Mr. Bell, from Pallas; about the year 1788, as *P. laciniata*, under which name it is described in *Flora Rossica*, but on its figure in the same work it is called *sibirica*. Pallas sent seeds of it to Murray as *P. heterophylla*; and it appears as *P. quinquecapsularis* in the Description of the Russian Empire by Georgi, who found it eastward of the river Ural, for we believe this to be our plant. We must, however, preserve the original name given by Linné, however objectionable.

The roots grow to a great size in their native state, and together with those of *albiflora* compose part of the food of the Mongol Tartars. Gmelin says the roots have a smell similar to that of the Florentine Iris; and Pallas compares it to that of bitter almonds or peach-kernels.

The fleshy protuberances which surround the base of the germens are nothing else than the perigynous membrane in another form, an appendage which never is entirely wanting in any of the species.

4. *Peonia tenuifolia.*

*P. foliolis multipartitis glabris lineari-subulatis, pedunculis brevissimis, germinibus tomentosis erectis.*


Native of the Ukraine, between the Tanais and Volga, on hilly grounds and perpendicular banks of the Terec. Plentiful in the Taurian Chersonesus. It first appeared in Zinn’s Gottingen Catalogue, published in 1757, and is admitted into the second edition of the Species Plantarum by Linné, who indulges in a fancy that one might imagine it was a bastard offspring of Paeonia and Adonis apennina.

The linear leaves are alone sufficient to characterize this species. The creeping surculi of its roots are also peculiar to it; and the small dark but bright red flower, supported on a very short peduncle and nestled as it were among the finely-divided leaves that crowd around the top of the stalk, together with the purple hairs which cover the germens, all sufficiently distinguish it from any other Paeony. It appears to have been introduced into this country by the late Mr. Malcolm, so far back as 1765.

P. hybrida of Pallas is not even a permanent variety. The sterile or rather the radical leaves in rich ground almost constantly assume a lineari-lanceolate form; indeed both descriptions of leaves are frequently produced on the same root. We have examined
mined many plants said to be seedlings, but never have discovered any perceptible variation in them.

5. **Paeonia officinalis**.

P. foliolis inaequaliter laciniatis glabris, laciniis ovato-lanceolatis, germinibus rectiusculis tomentosis.


Native of the mountainous woods of Helvetia, Provence, Montpellier, Dauphiné, Piedmont, Carniola, the Grecian Islands, and most
most of the hilly regions in the south of Europe. Also on Caucasia and in Georgia (Pallas). Quer in his *Flora Española* states that it is frequent in Spain, particularly on the mountains of Avila.

The history of the present species may boast of a greater antiquity than that of most plants. There can be no doubt of its being the *Paonia* of Pliny, to which such great medical virtues were attached.

Were we to trust to the double varieties, which are by much the most common in this country, we should conclude that this species was altogether free from pubescence; but on examining the single-flowered sorts, we find two out of three that have come under our observation slightly villous; so little reliance is to be placed on that property. Retzius is the only writer who has fully described this species, and his description is, in our opinion, without a fault. He has laboured perhaps over-much in defining the divisions of the leaf, which are so apt to vary, from soil and situation, as to baffle any such refinement of description. There are two specimens in the Cliffordian herbarium named *anomala*, which we take to be those of a variety of this species with narrower leaves than any we have seen elsewhere; they are certainly not specimens of *anomala*, for they have woolly germens, a decided mark of distinction between these two species.

We have been obliged to reject many synonyms, to prevent swelling the list to an unreasonable length. All the old herbals have noticed, if not figured, the "female peony." We have inspected six distinct varieties.

**u. Sabini:** floribus atro-purpureis, foliis omnino glabris.

A few years ago no person knew that a plant of the single-flowered *P. officinalis* existed in this country. Mr. Sabine had the good fortune to discover one in the corner of an old garden at Great
Great Berkhamstead in Hertfordshire, where it possibly had remained undisturbed many years. The flowers are precisely of the same colour with those of the common double-red, but the petals expand a few days earlier. The leaves are less waved. The petals of all the single-flowered varieties are more inflexed than those of the pubescent species, being formed into the shape of a cup, contracted at the mouth. An abundant supply, of plants of this variety, has been imported from Holland since the peace, not differing materially from Mr. Sabine's plant. The figure in the *Botanical Magazine* was taken from one of those.

\[ \beta. \text{ rosea}; \text{ floribus saturate roseeis, caulibus erectis.} \]

This variety was observed by Mr. Sabine in the Oxford botanic garden, along with the plant that follows. We cannot obtain any account of their history: they have in all probability been very old tenants of that garden; perhaps since the days of Morison, in the latter end of the seventeenth century; nor do they seem to have found their way out of it, till Mr. Sabine was obligingly presented with roots of them by Professor Williams.

This has very broad undulated and obtuse leaflets, of a dark hue, tinged with red on the edges, and with a few slight hairs on the ribs of the under surface. Flowers of a pleasant rose colour; germens 2—3, densely tomentose, diverging at the apex. Stem erect, as tall as var. \( a \), flowering a fortnight earlier, about the middle of May.

\[ \gamma. \text{ blanda}; \text{ floribus saturate roseeis, caulibus laxis.} \]

Obtained, as before mentioned, from the Oxford garden. The leaflets of this variety are likewise broad, though less so than the preceding; also much less undulated, and of a peculiarly pale green colour for a plant of this species: and, like those of the *rosea*, furnished with a few hairs on the back of the leaf. Stalks spreading; petioles reddish; flower of same colour and same time
of flowering as the preceding; germens generally three, upright at first and finally diverging.

Notwithstanding the partial pubescence observable on this and the preceding, we are in no kind of doubt in considering them mere varieties of the first-described and of the double-flowered varieties enumerated below.

\[ \delta. \ rubra; \ floribus \ plenissimis \ atro-purpureis. \] Double red Paeony.

\[ \text{P. femina polyanthos. Lobel Ic. 684.} \]

\[ \text{P. polyanthos. Camerarius Hort. p. 114.} \]

\[ \text{P. flore pleno rubro. Joh. Bauh. v. iii. p. 493.} \]


\[ \text{P. foemina multiplex. Ger. Em. p. 981. Tabernem. Ic. p. 784.} \]

\[ \text{P. foemina vulgaris flore pleno rubro. Park. Par. p. 342 & 343.} \]

\[ \text{fig. 3.} \]

\[ \text{P. officinalis rubra. Double red Paeony. Sabine in Hort. Trans. v. ii. p. 274.} \]

To this variety we may apply the words of Besler; "vulgatissima est omnium Paeoniarum;" and we may add without exaggeration, the most splendid of all flowers. Even the fine double Paeonies from China, rich and magnificent as they are, cannot be compared for brilliance with this common inhabitant of almost every cottager's garden in England. Nothing but its extreme vulgarity and the extraordinary fecundity of its roots could have brought this beautiful plant into the neglect it has suffered for a century past.

The first account given of it is in the edition of Lobel's Icones, 1581. Camerarius writes, in 1588, "id est flore pleno quae ante paucos annos apud nos est accepta coli;" from which we may conclude that it was at that time a recent discovery. The gardens
dens of Europe have been enriched with it, therefore, upwards of two centuries.


This beautiful variety is not of so old an introduction as the preceding. Morison gives us the first account of it, in 1699. The flower opens of a fine rose colour, and afterwards becomes pale flesh; it is not so common as the preceding, but nevertheless is too well known among the gardeners to require any further description.


Tabernaemontanus records this variety in 1590; it therefore must have come into notice nearly about the same period as the double red. The flower of this bursts forth of a pale pink, and at length becomes almost quite white; is very common along with the double red in most of the old gardens, from which even neglect and bad treatment will not banish them.


P. *foliolis distinctis ovatis planiusculis glabris, intermedio sublobato, felliculis recurvatis tomentosis*. 

P. co-
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Fr. v. v. p. 643. Smith Flore Graecæ Prod. v. i. p. 370

Fr. v. v. p. 643. Blackwell Herb. t. 245.


This is recognised as P. mas of Pliny and other ancient writers: upon what ground it obtained this title we cannot conjecture. It retained it, however, till Retzius, describing it for the first time scientifically, gave it that which it now bears. It is strange that Linné, who must have seen both plants, should persist in considering
dering this and *P. officinalis* as only varieties of the same species, no two plants in the whole genus being more distinctly separated.

The leaves of some varieties lately brought from Holland differ in being less or more pitted, but do not display any disposition to intermingle with other species. The leaves and stem are always quite free from pubescence in all our examples; though Ray, who copies John Bauhin, says that the leaves are "lanugine quadam aversa parte pubescentibus," owing possibly to the carelessness of old writing.

Native of mountainous woods in the south of Europe, as in the neighbourhood of Alais in Languedoc; frequent in Switzerland, and on the Alps generally: also on Mount Ida and in the island of Zante. Our claim to it as a native of Britain is perhaps but slender. It grows apparently indigenous on a small island in the Severn frith, called the Steep Holmes: and Gerard says that it grew wild in his time near Southfleet in Kent, but his editor Johnson unceremoniously observes that he planted it there himself.

7. *Peonia daurica*.

*P. foliolis distinctis subrotundis undulatis obliquis integriusculis glabris, foliiculis patentibus tomentosis.*


We
We believe this to be a discovery of Pallas, and that it is *P. tri-
ternata* of his Tour, and of Georgi's Description of the Russian
Empire published at Königsberg in 1800. The late Mr. Bell
received seeds of it from Pallas prior to the year 1790: it is said
to be a native of Siberia, but its native habitat is not precisely
known.

Though in general habit a good deal resembling *P. corallina*, it
is nevertheless essentially distinct from that species, in having its
leaves always rounded, partially cordate, oblique, and much un-
dulated; whereas those of the former are more or less pointed
and nearly flat: the spherical, brownish-black, reticulated seeds,
and the yellow tint of its leaves, stalks, and germens, would other-
wise characterize it.

Its leaves are disposed to wither at the points and to remain
longer on the stalks than those of the others. Its flower is of a
pleasant pale rose colour. Among seedlings it is seen to vary in
the degree of undulation of its leaves, but retains its essential
character throughout.

8. *Paeonia humilis.*

*P. foliolis tripartito-compositis lanceolatis acutis canaliculatis sub-
villosis, germinibus rectis glabriusculis, stigmatibus erectis.*


*P. hispanico semine nata.* Clus. Hist. v. i. p. 279.

p. 455. 8.

*P. fœmina pumila.* Ger. Em. p. 982. 6, quoad Iconem.

*P. fœmina hispanica pumila.* Park. Herb. 1379. Rauï Hist. v. i.
p. 694.
272 Mr. Anderson's Monograph of the Genus Peonia.


This species may be recognised with tolerable precision as that mentioned by Clusius, an acute observer and original writer, who described a great number of plants then unknown, which he observed in the countries visited by him towards the latter end of the sixteenth century. He discovered it in Spain; which is happily confirmed by our countryman Dr. Shuter lately returned from that country, who says he saw P. humilis growing abundantly on the mountains. It seems indeed to belong exclusively to Spain, unless it be what De Candolle considers a variety of P. peregrina, observed by him on the Serane mountains with smooth germens, and the segments of the leaves "plus pales et plus allongés," which we think highly probable. P. lusitanica of Miller, "with flowers of an agreeable sweet scent," cannot be reconciled with this or with any species we know. We suspect that Willdenow did not know this species, otherwise he could not have mistaken P. paradox var. β. for a double-flowering variety of it in his Enum. Plantarum.

The plant which we describe is probably an offspring from the seeds obtained from Spain through Clusius: how or when it came into
into this country is uncertain; possibly from the Dutch, who seem to have retained a taste for Paeonies long after they had got out of repute in this country. We found it in the nursery of Messrs. Chandler and Buckingham, at Vauxhall, who do not know from whence they obtained it. The figure in the *Botanical Magazine* is taken from their plant.

It is characterized by narrower, more subdivided and smoother leaves than those of any other species in the present subdivision. It differs too from the following in its smooth follicles, and from it and all other known species in the stigmas being elongated and almost upright, resembling styles; an important character, which Retz in his description, otherwise excellent, has altogether overlooked.


*P. foliolis tripartito-laciniiatis oblongis obtuis canaliculatis sub-tus pilosis, germinibus pubescentibus patentibus, stigmatibus recurvatis.*


*P. foemina byzantina. Park. Par. p. 342 & 343. t. 2?*


This and the three succeeding species are nearly allied to each other: it is, however, frequently a much easier task to determine...
a species than to describe it. Being satisfied that they are distinct, we have endeavoured to give the best distinguishing characters that a close examination of three seasons has afforded us.

Our present plant we do not hesitate to refer to that which Clusius obtained from Constantinople; as the description which he and the succeeding writers give of it agrees with ours, and it also comes from the same quarter.

It is remarkable for the elegant stateliness of its habit. Each stalk accompanied by its horizontal leaves, diminishing as they ascend, and terminated by its flower, (which is rather smaller than is usual in the genus,) supported on a long peduncle, exhibits somewhat of a pyramidal figure. Its leaflets are constantly more or less longitudinally inflexed or concave: in this respect it resembles the last described, but differs from it in the leaflets being broad and obtuse. The follicles are less pubescent than those of the three following species, but more so than those of the preceding; they are very large, and at maturity diverge widely, but do not become so much recurved as those of P. arietina.

We have only observed two varieties.

a. Pallasii; folioli is anguste oblongis.

Seeds of this plant were received by Messrs. Lee and Kennedy from Pallas, probably from the Crimea, where he spent the latter years of his life. The name he gave it, if any, has been lost; they called it *byzantina*: its flower has a fine deep rose colour, in shape and appearance not unlike that of *Papaver somniferum*; the seedlings came up without exhibiting any apparent variation.

b. elatior; folioliis lato-oblongis.

First observed in the nursery of Messrs. Chandler and Buckingham, who believe they got it from Holland. It differs from the preceding in the leaves being somewhat broader, and the plant
plant altogether more robust and rather more pubescent; unquestionably a mere variety.

10. _Peonia arietina_.

_P. folioliis trilobatis pinnatifidisque decurrentibus ovali-oblongis planiusculis subtus pilosis, foliicolis tomentosis arcuato-pa-
tentibus._

mum arcuata, parum recurvata. Stigmata compressa, lunata, brevia, rubicunda. Semina ovata, nigrig, rugosa. Floret a medio ad finem Maii._

This species is by much the largest among those of the present division. Its distinguishing characters consist in the leaflets being decurrent, often even confluent, and in the germens being arched and frequently recurved, suggesting a resemblance to rams' horns: it seems to have been well known to the old authors, as will ap-
pear in describing the varieties.

_a. Andersonii_; floribus saturete roseis, petalis minus crispis.


This plant, to which Mr. Sabine gave the cognomen, owing to his having obtained it from me several years ago, though not common about London, probably having been banished with contempt for its single flower, is nevertheless still to be seen in remote parts of the country in the gardens of old baronial man-
sions: in such situations we knew it many years ago in Aber-
ndeenshire,
deenshire, where it is still to be found under the name of the Single Paony, and the only species with single flowers we ever observed in those parts.

We attach J. Bauhin's synonym without hesitation; his description of it, which Ray and succeeding authors have copied, being so applicable: "Folia siquidem quæ imis ramis hærent, latiora sunt quam cæterarum, rotundioraque; aversa parte glauca, hirsuta, adversa saturatius virentia itidemque pilis obsita; siliquæ retortæ, hirsutie alba totæ contectæ."

From analogy we presume it to be a native of the Levant. Its flowers are of a bright but deep rose colour, resembling most those of daurica, and appear very handsome over its abundant dark though glaucous leaves. Morison's figure, No. 3, is so bad that we cannot quote it.

\[ \beta_{oxoniensis}; \text{floribus carneis, petalis lacero-crispis.} \]


This is probably No. 6. Ger. Em. p. 981, as to the description, "in our London gardens bearing flowers of a pale whitish colour, very single, resembling the female wilde Peiony;" although the figure of No. 6 is that of another species (humilis). And from Parkinson's notice of it we presume it must have been among the gardens in his days, though no where to be found three years ago in this country but in the Oxford botanic garden, where it seems to have existed unnoticed and unknown since the time of Morison, whose description of it is very satisfactory: "quam in horto alimus, cujus folia latiuscula lanugine alba utrinque obsita sunt. Flores
Flores simplices primo emergentes, subcarnei, deinde in albos transmutantur.” Mr. Sabine was indebted to the liberality of Professor Williams for roots of it from the Oxford botanic garden.

From Clusius we learn that this is a native of valleys on the highest mountains in Crete; which its habit confirms, having all that woolly-like softness in its young stalks and leaves so peculiar to the plants of that island. If it be P. ochranthemos Camerarii, it has been found in Navarre; but this last authority is not at all conclusive.

This is among the earliest of Pæonies; comes out of the ground of a pale glaucous green colour, destitute of the ruddy tint so common in the genus. Petals of a beautiful pale blush colour, crisp, and lacerated in a greater than usual degree. Follicles almost reflexed when ripe, less woolly and of a lighter colour than those of var. α. Roots of a Pæony have been imported by Messrs. Chandler and Buckingham from Holland which prove to be this plant.

11. Pæonia peregrina.

P. foliolis tripartito-lacinios intègrisque ovato-lanceolatis planis usculis subtus pilosis, germinibus tomentosis rectis.


This species is involved in much obscurity among the old authors; and since it has been restored by modern writers, no detailed description of it has yet been published. For several years successively we have examined three plants, each of them differing considerably from the other, and they prove to retain unchanged
unchanged their respective habits. It is not possible, however, in the present state of our information, for us to pronounce whether these be specifically distinct or not; and we deem it expedient, in order to pave the way for a subsequent decision on this point, to give a separate description of each, as we have observed it.

P. peregrina, De Candolle informs us, is a native of the mountains of Provence and Languedoc, chiefly near Montpellier; also abundant on the mountains La Serane and Pic St. Loup, and in the forest of Valene; but which of our plants, (or whether all three together) is intended by him, unfortunately his defective description denies us the means of judging. It also belongs to the Levant, as will afterwards appear. Bulliard, vol. iii. p. 300, we think refers to it; but his description is bad, and his figure worse.

a. byzantina.


Clusius received seeds of a Pæony from Constantinople in 1588;
his description of which, under *P. altera*, accords with the present plant: it may therefore be considered as a native of the Levant. If our quotation from Morison be correct, it must have been an old tenant of our gardens, although it is not now commonly to be seen. Our plant was obtained from Kew, the same from whence the drawing was taken for the *Botanical Magazine*.

This plant is remarkable for the pale grass-green colour of its leaves, which Clusius and Morison both take notice of; these are much divided, and covered underneath with white hairs. It comes into flower a little later than *arietina*, from which it differs in the leaflets being more obtuse at the base, seldom decurrent, in the whole plant being considerably smaller, and in the germens being straight and erect.

If the oblong shape of the seeds be a permanent character, it alone would be sufficient to distinguish it as a separate species.

*ß. compacta.*


Found in the nursery of Messrs. Lee and Kennedy under the name of *anomala*: but we are unable to obtain any account of its origin; nor can any notice of it be discovered among the authors, only that, as it corresponds sufficiently with De Candolle’s description, and having traced the foregoing plant to Constantinople, we might conjecture that this comes from the south of France. It is probably a distinct species. It differs from *paradoxa*, which it much resembles, in the fissures of the leaves being deeper though nearly equally obtuse, petals entire, calyx pubescent, and germens scarcely ever more than two, besides its being
being nearly a fortnight earlier in flowering. This plant is remarkable at first sight by its general compact bushy habit, and by its broad flat dark glaucous-green leaflets; not yellowish-green nor bordered with red, like the foregoing.

7. Grevillei.

Radix praecedenti similis. Caulis bipedalis, glabriusculus. Folia biternata; foliola profunde laciniata, valde undulata, interdum tortuosa, angustata, acuta, rugosa, glauca, margine rubicunda. Calyx glaber; stigmata acutiuscula; semina rotundata. (Cætera ut in var. a.)

Obtained by Mr. Sabine from the garden of the late Mr. Greville, who cultivated it as a new species, but whence it originally came he could not learn. We found the same plant in Messrs. Lee and Kennedy’s nursery, without any name; its history is equally ambiguous with the preceding, but it may be supposed to have come from the same quarter. It is conspicuous by its deeply and numerously laciniated leaflets, which are glaucous, very much undulated, and sometimes twisted. It comes into flower rather earlier than the other two; petals deep crimson, not so dark as those of var. a.


P. foliolis multipartitis obtusis undulatis, subitus glauco-pilosis, germinibus adpressis tomentosis.
P. promiscua seu neutra. Lobel Ic. 683.
P. peregrina. Smith in Rees’s Cyclo. : absque synonymis.

Radix ut in praecedentibus, tuberibus vero angustioribus et Paulo magis sparsis. Caulis vix sesquipedalis, glabriusculus, simplex. Folia biternata, praecedente minora, foliola trilobata, varie et inordinate incisa, nonnumquam ternata. Laciniae sæpius bifide

From a general coincidence we conclude this to be the P. promiscua of the old authors. Both the varieties we believe came originally from Holland at some early period. It appears to be a native of the Levant.

This is the latest in coming into flower of all Paeonies, excepting albiflora; its flowers seldom expand before the latter end of May: it forms a dense tuft of leaves and flowers, more dwarf than humilis, and is the lowest in stature of all the species excepting mollis.

From peregrina it differs in the leaves being small, ovate, and more glaucous; the leaflets more divided, crowded, and imbricated; the ultimate fissures shallow and obtuse; in the germens being close pressed together, and very little separated even in the ripe follicles.

These considerations, together with the uniformity of character in the two varieties, which both flower a fortnight later, have induced us to remove them from peregrina: future observation may decide whether our judgement be correct. Our learned President, who must have had this plant before him in describing P. peregrina in Rees's Cyclopaedia, observes with his usual correctness, that it does not accord with P. peregrina flo. coccineo of Besler, the figure of which is that of our peregrina; nor with byzantina of Gerard and Parkinson, which is our decora.

a. simpliciflora; caule omnino glabro, floribus 8-petalis.

To be found in most of the nurseries, under the mistaken name
of *humilis*: the follicles are of a paler green than in *peregrina*; petals a dark purplish-red, often bifid, or a little lacerated.

β. *fimbriata*; caule vix pilosiusculo, floribus plenis.

P. foliis difformiter lobatis pubescentibus. *Mill. Fig. of Plants*, 199: *mala*.
et Sect. xii. tab. 1. *fig. 17*.

Messrs. Lee and Kennedy have long possessed this plant; and Messrs. Loddiges and Son imported it from Holland under the name of the double-purple *Paeony*. It is the only plant among the pubescent species with double flowers. These are of a beautiful purplish crimson, smaller in size, and with the inner petals more linear and divided than those of the double varieties of *P. officinalis*, giving it the appearance of a fringed tassel. It accords in every material circumstance with the single-flowered plant.


This species is entirely unrecorded. It was raised by Messrs. Loddiges and Sons of Hackney, from seeds obtained from Pallas, and said to be from Siberia; although from its appearance we should rather suspect it to have come from the Crimea, where that respected naturalist spent the latter years of his life. From Messrs. Loddiges it has found its way into the gardens of the curious under the mistaken name of anomala. We distinguished it three years ago in Mr. Sabine's collection as a truly distinct species; and it has been reserved for us first to describe it.

This plant is at first sight distinguishable from its congeners by its short, rigid, upright stalks, the dark blueish-green colour of its leaves, which are flat, compact, very much divided, the laciniae crowded, overlapping each other, very woolly on the under-side, nowise bordered with red as in most of the others, and the lateral leaflets being almost sessile, the exterior side of each disposed to be decurrent. It is the most dwarf of all our species, seldom reaching eighteen inches in height even in our gardens. The stalks as well as the primary petioles are nearly smooth. The flower is small, of a dark dull purplish-red, by no means handsome.

POSTSCRIPT BY JOSEPH SABINE, Esq.

Two days after the preceding account had been brought to its present state, by the diligence and industry of my most valued friend, he was accidentally killed by a fall from a carriage. This melancholy event happened on the 10th of January last, near his own house at West-Ham; and the superintendence of the publication of this paper in consequence of this misfortune has fallen on me alone: thus the gratification I had enjoyed in assisting him in the composition, and which would have been complete had we been able
Mr. Anderson's Monograph of the Genus Paeonia.

able to see the result of our inquiry placed in the pages of the Transactions of the Society, was suddenly destroyed; and that which would have afforded me so much pleasure, has now been a task, accompanied with the most painful recollections.

To those who had the happiness of being acquainted with Mr. George Anderson, it will not be necessary to recall the recollection of his merits and of his goodness; his loss has been most severely lamented by his friends, and the remembrance of his virtues and of his excellence will remain in their hearts to the latest period of their lives. The science of Botany in this country, had he not been so early lost, would probably have been considerably benefited by his labours. He had devoted much time and minute attention to the investigation of the genus Salix, the species of which he had examined with the greatest care; and having formed a most extensive collection of them, he had made such progress in their arrangement as would have enabled him, had he lived, ere long to have communicated to the public a very accurate and correct account of the whole. His inquiries were not, however, confined to this subject only; his knowledge of English plants was accurate and extensive, and his diligence and perseverance in the search after rare and new native species very remarkable. With all the different hardy bulbous plants he was particularly well acquainted, and had acquired a knowledge of the species and varieties of the extensive genera of Crocus, Narcissus, Tulipa, Hyacinthus, and Lilium, from the examination of them under cultivation in his own garden, which probably no individual who survives him possesses.

I have not ventured to alter or to add to any part of the preceding paper; the examination which I was enabled to make of the Paeonies during the last summer, has given me no reason to doubt the accuracy of any of the observations for which we were jointly
Mr. Anderson's Monograph of the Genus Paonia.

jointly responsible: it is possible, I think, that new varieties may be discovered, and that future investigation may add to the references which we have given; the work cannot be considered as complete, whilst any synonym of those authors, who described what they actually observed, remains unapplied; such additions, if they be thought worthy of notice, shall be given hereafter in a supplemental paper, should health and leisure be allowed me.

The first volume of M. De Candolle's Systema Naturale Regni Vegetabilis, which has just arrived from Paris, contains the genus Paonia; and as that work must, from its peculiar merit and from the great repute of its author, be constantly referred to as authority, it will perhaps be considered not entirely useless to compare the species of our paper with those of M. De Candolle, and to endeavour to reconcile the points of apparent difference. He has not arranged his species in the order which has been adopted in our paper, but placed them in the following succession: 1. Moutan; 2. Corallina; 3. Officinalis; 4. Peregrina; 5. Lobata; 6. Daurica; 7. Albiflora; 8. Tatarica; 9. Humilis; 10. Anomala; 11. Hybrida; 12. Tenuifolia; 13. Laciniata.

In Moutan he has made the double one the type of his species, and under that has referred to our two double varieties; placing P. papaveracea as the second variety, and suggesting the possibility that it may be a distinct species.

Of P. albiflora he makes two varieties only; his α, judging by the reference to Andr. Repos. 64, is our P. albiflora α. vestalis; his β. flore roseo is our P. albiflora γ. Tatarica, as I conclude from his reference to Par. Lond. 78, though the plant there figured is described as having "petala pallide rosea," whilst that with "petala rosea," therein noticed as another variety, is either our P. albiflora ε. rubescens, or one which, if ever it did exist in our gardens, is now lost. M. De Candolle's reference to the Hortus Kewensis,
Kewensis, 2d edit. in this species is only to the var. β, as if that alone was noticed therein; whereas P. albiflora of the Hortus Kewensis is referable to the species itself; and the variety figured in the Par. Lond. is the second variety β of P. albiflora in the Hortus Kewensis. M. De Candolle has no references to the figures in the Botanical Magazine or the Botanical Register; and I conjecture that he is not acquainted with more than the one double variety, P. albiflora β. Whitleyi, to the figure of which in Andr. Bot. Repos. he refers.

Our two species P. anomala and P. tenuifolia agree with those of M. De Candolle; but he has kept as a distinct species P. hybrida, adding to the statements of Pallas, the authority of Dr. Fischer, who in his correspondence has assured him he found it growing on the northern side of Mount Caucasus, and that it was not an hybrid plant, but a genuine species. Being fully satisfied that Pallas’s plant, figured and described in the Flora Rossica, and which was from a cultivated specimen, is only P. tenuifolia in a state it sometimes assumes, but different from what it usually puts on, I must still continue my opinion of their identity. In Dr. Fischer’s Catalogue of the Garden at Gorinki near Moscow, printed in 1808, he does not enumerate P. hybrida. Should this plant, however, after more investigation, prove distinct from P. tenuifolia, I shall rejoice in the circumstance, as our list of species of this charming genus will thereby be increased; but if P. hybrida be distinct, it cannot be set down as one now cultivated in this country.

P. officinalis, on the authority of several French authors, has been considered hitherto a native of different parts of France: it seems from the personal observation of M. De Candolle, most probable that other species have been mistaken for this; and I should not be surprised, if subsequent examination of specimens from
from the natural habitats, should very much reduce the number of synonyms of modern writers which have been hitherto applied to this species, and that by this operation the native places of growth of those new species described by us from cultivated plants only, should be discovered. One reference of M. De Candolle, viz. that to "Saku Jaku, Kämpf. Amæn. v. p. 862," I must consider as very doubtful: the result of every inquiry I have made is, that only P. Moutan and P. albiflora, with all their varieties, are cultivated in China and Japan; the Botan of Kämpfer is the first of these species, and I believe the Saku Jaku is a variety of the latter with single red flowers, and that the two double varieties of the same, mentioned by Kämpfer, are our P. albiflora Whitleji and P. albiflora fragrans.

P. corallina is now so well known that no doubts can exist about it, or the synonyms referable to it. M. De Candolle has confirmed our belief, that P. daurica is the P. triternata of Pallas and Georgi: and P. humilis is so well settled by the authority and accuracy of Retz, that no difficulty can exist relating to it.

The synonyms which we have applied to our P. decora, are all referred by M. De Candolle to his P. lobata; and I am inclined to think they are the same, though from the circumstance of his plant being quite smooth in the leaves, and ours being hairy underneath, they must, if brought together as a species, remain as distinct varieties: in all other points, except this one, they agree. As the P. lobata is cultivated in France, and as Mr. MacLeay has got a plant of it from Paris in his garden, the question will be probably settled in the next summer.

With our P. arietina M. De Candolle seems to be quite unacquainted; the synonyms of Bauhin and Morison, applied by us to P. arietina a. Andersonii, are referred with a mark of doubt to his P. peregrina; whilst those of Clusius and Bauhin, which we
have quoted as referable to *P. arietina* β. *Oxoniensis*, make one of his unknown *Paonia*.

The next species, *P. peregrina* of our paper, I cannot refer to that, to which the same name is applied by M. De Candolle in his present work; relying on the reference in his *Flore Française*, to the figure in the *Bot. Mag.*, we had considered the *P. peregrina* of his work as our species; but in the *Systema Naturale Regni Vegetabilis* the *P. peregrina* of the *Hort. Kew.* and of the *Bot. Mag.* (of the identity of which plant we are quite certain) is made the variety γ. of his species; and this variety must hereafter be referred to as a synonym of our *P. peregrina* α. *Byzantina*: with our two other varieties of *P. peregrina*, viz. *compacta* and *Grevillei*, I must suppose M. De Candolle to be unacquainted; it then remains for me to find a place for the varieties α. and β. of his *P. peregrina* in our arrangement. We have concluded that our *P. paradoxa* is the *P. promiscua* of the old authors, of Lobel, Gerrard, and John Bauhin. To this plant of these writers, as well as to the *P. altera sive neutra* of Caspar Bauhin, we on examination of the living plant referred that species. M. De Candolle, with his plant (a native of France, found by himself,) before him, has referred it to the same authors: our description of the plant exactly accords with his, and particularly agrees in the circumstance of its low growth. The only difference which prevents my coming to a decided conclusion in the identity of the two is, that M. De Candolle, in his specific character, has "capsulis tomentosis basi erectis apice discurrentibus," whilst the corresponding part of our specific character is "germinibus adpressis tomentosis," the divergence of the germens being one of the points by which our *P. peregrina* is distinguished from *P. paradoxa*. Notwithstanding this difficulty, I think it will turn out that our *P. paradoxa* is the *P. peregrina* α. of M. De Candolle; but we must wait for specimens or plants from France.
France to settle the matter decidedly. Of M. De Candolle's *P. peregrina* β. "ovariis glaberrimis," we have hinted our belief that it might be referred to *P. humilis*: M. De Candolle, in his *Flore Française*, suspected it to be *P. peregrina* in an unhealthy state, and not a variety, which I am inclined to think very likely. If it be a distinct variety, I certainly never have had it under examination.

I have now compared all the species described in our paper with those of M. De Candolle, except *P. mollis*, which being quite a new plant, unknown in France, and not described before by any author, was not likely to have been noticed by him. His *P. Moutan*, *P. corallina*, *P. officinalis*, *P. Daurica*, *P. albiflora*, *P. humilis*, *P. anomala*, and *P. tenuifolia*, are the same as our species so called: his *P. peregrina* I think is referable in its varieties to our *P. paradoxa* and *P. peregrina*; his *P. lobata* I believe to be our *P. decora*; and I am ready to admit *P. hybrida* as distinct from *P. tenuifolia*, when the evidence of its existence is confirmed; our *P. arietina* and *P. mollis* are decidedly new. It therefore only remains to notice two additional species enumerated by M. De Candolle as doubtful ones; viz. *P. Tatarica* and *P. laciniata*, both of which I conceive must be withdrawn from the list of genuine species.

He appears to have been induced to notice *P. Tatarica* solely on the authority of Miller, the plant not being otherwise known to him, for he only refers to *Miller's Dict. no. 5*, and *Miller's Ic. t. 199*. Miller says this plant was raised from seed obtained from the Levant, and that there is a double and single variety of it, the figure in his *Icones* being intended for the double one. M. De Candolle, on the authority of Miller, calls it a native of Tartary, but I cannot find any statement in *Miller's Dictionary* to justify this supposition. Miller's *P. Tatarica* is however our
Mr. Anderson's Monograph of the Genus Paonia.

P. paradoxa, as such we have referred to his figure, in the synonyms of the double variety; and our P. paradoxa I have before stated to be in my opinion the P. peregrina a. of M. De Candolle.

The P. laciniata in like manner is founded on a single authority only, that of Willdenow's Enumeratio. Willdenow's plant came from Siberia; and it might be suspected that he had got Pallas's P. laciniata, which is the P. anomala of Linnæus and all subsequent writers, and had erroneously considered it distinct, being misled by the name, but that he describes it "capsulis tomentosis." This circumstance (since it cannot be admitted that it is another species, or it would have found its way to other collections from the Berlin garden,) makes it probable that Willdenow's P. laciniata was only a strong-growing plant of P. tenui-folia, perhaps in the very state figured by Pallas as P. hybrida. M. De Candolle has described his P. laciniata with "capsulis tomentosis patentibus;" the addition of this latter term not being a part of Willdenow's description.

North Mimms,
20th December, 1817.
THE

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XVII. Observations on the Linnean Genus Juncus, with the Characters of those Species, which have been found growing wild in Great Britain. By James Ebenezer Bicheno, Esq., F.L.S.

Read June 18, Nov. 5, and Dec. 3, 1816.

Of all the objects to which the pages of the Linnean Transactions have been devoted, none has contributed more to the progress of science than the monographs which have appeared of the different genera of animals and plants. With a view, therefore, of contributing a small share to the labours of the Society, I have ventured to communicate a few remarks for the purpose of elucidating the obscure and uninviting genus Juncus: for though an inaugural dissertation has been dedicated to the subject by Rostkov, intitled "Monographia Generis Junici, cum Tabulis binis eeneis," Berolini, 1801, it is a work not to be found in any of our botanical libraries; and, though containing much useful information, does not supersede the necessity of a further illustration of the genus. His arrangement of the species is indeed altogether unnatural and objectionable, as he has brought together into close connexion some of those which have the most distant relation in the whole genus. The French botanists have commemorated the author by naming after him a new genus, naturally related to the objects of his essay.

The old herbalists seem to have had no other character for the Junici than their grassy appearance, and their internal spongy structure. This comprehended an heterogeneous assemblage of plants
plants of various genera, e.g. Scirpi, Schœni, Cyperi, Triglochines, Butomus, Eriophora, and others. Nevertheless, with all this confusion, they divided the real Junci, which are included in the first subdivision of the genus in the Species Plantarum, into two families, the hard and the soft; the former being all called acutus, and the latter lavis*. The Gramina hirsuta, which are those Junci described as plane-leaved by Linnaeus, were kept entirely distinct, and were arranged among the Grasses.

Our systematic countryman Ray gives this description, "de Junco et Gramine Junceo†:"—"Juncus caulibus teretibus, fungosis, panicula vel in summo caule existente, vel ex ejus latere inferius exeunte, et multis seminibus majusculis compositâ à reliquis graminifoliiis distinguitur. Gramina juncea à juncis distinguuntur caulibus foliosis articulatis. Folia etiam in his non semper teretia sunt, sed in nonnullis speciebus compressa, in omnibus tamen fungosa." The latter part of this description alludes to such as have jointed leaves: but Ray confesses that he has admitted under his definition, in conformity to the opinion of other botanists, plants which he did not know how to dispose of otherwise. He has placed the Gramina hirsuta in a distinct division. In the second edition of his Synopsis, the Gramina juncea are said to differ merely in their having a leafy stem. Ray's definition, it must be confessed, very much lessened the number of plants which were at first admitted, though it still embraced the Eriophora, Triglochines, and some of the Schœni and Scirpi. No improvement of the character appears, as might be expected, in the Methodus Graminum, published afterwards; but on the contrary, it is more loosely defined. Dillenius, in his edition of the Synopsis, introduced considerable correction both in the character of the genus and the synonyms, and the true Juncus is

* Bauh. Pin., p. 11.  † Historia Plantarum, p. 1302.  thus
thus described: "Calyce hexaphyllo, staminibus totidem, quot sunt calycis folia, et semine multo in vasculo seminali recondito a Scirpo differt*." The species are also divided into those which are leafy and those which are leafless.

Scheuchzer and Haller have included the *Gramina juncea* and the *Gramina hirsuta* in their *Juncoïdes*, rejecting at the same time from the former family the *Eriophora* and some other genera which Ray had retained. The real *Junci*, such as *acutus*, *glaucus*, *effusus*, &c. rank under a separate division, with this definition: "Flosculi hexapetalii, rosacei, sex scilicet petalis in orbem positis constantes."—"Vascula seminalia triqueta aut ex triquetro rotundata, trivalvia, septoque per medium cujusque valvae longitudinem procedente, in tria loculamenta divisa, seminibusque plurimis plerumque, ac minutissimis repleta, a Juncoïde autem specialiter differt, scirpis teretibus, prorsus enodibus†;" &c. Tournefort, whose attention was chiefly arrested by the corol, has included in his character all three of these strongly-marked families, because he found their petals, otherwise called the leaflets of the calyx, to correspond. The penetrating Micheli, however, led more by the internal structure of plants, adopted two distinct genera; the first, *Juncus*, which he describes as having a trilocular, many-seeded capsule; the other, *Juncoïdes*, with a unilocular, three-seeded capsule. The great Linnaeus, guided by Tournefort, re-joined them; and at the same time adopted in his generic character the peculiarity of the *Gramina hirsuta*, as being unilocular;—by which inconsistency the real *Junci* are all excluded! Jussieu does not describe the cells in his generic definition; but at the head of the natural family he calls them trilocular.

The *Gramina hirsuta* seem to have been first taken up by J. Bauhin under the name of *Luzula*. Cesalpinus calls the *Junc-

* Rail Syn. 3d ed. 431. † Scheuchzer's Agrostographia, p. 337.
cus campestris, Linn. "Herba Luziola vulgo;" and the reason, as Gerard informs us, is, that the heads of the flowers shine in the night; "wherefore in Italy they call it Luciola quia noctu lucet." Tabernæmontanus and Ruppius call the family Cyperella; Scheuchzer, Haller, and Micheli, Juncoïdes; Willdenow (Hort. Berol.), Lamarck and Decandolle (Flor. Franc.), and Désvaux, have established the genus under the name of Luzula. The last-named botanist has published a paper on the subject in the Journal de Botanique, vol. i. p. 131; and the alteration has been recognised by our own learned and indefatigable countryman, Mr. Brown, in his Prodromus Floraë Novæ Hollandiae. The different habit and striking character of the two families would have been enough to have caused their separation; but, sanctioned by these weighty authorities at home and abroad, it can no longer be a subject of doubt.

In distinguishing the species of Luzulae, I have derived great assistance from observing the shape of the seeds, and of what I have ventured to call the Coruncula, attached to them; the figure of which, if well observed, will set at rest any hesitation that may exist about the British species. The same appendage is incident to many of the real Junci, and may be particularly remarked in J. acutus, maritimus, triglumis, castaneus; and in the foreign J. grandiflorus, Linn., now made a new genus by Desvaux, on account of this striking character, under the name of Marsippospermum. The seeds of Narthecium ossifragum, which is nearly allied to the plants under discussion, have an integument of the same nature.

Besides the attempt to adopt a new genus into the British Flora, I have given in the following pages what I conceive to be amended characters of all the species of Juncus and Luzula yet discovered in Great Britain; and have added some few new ones, which were either imperfectly known, or regarded only as varieties.
varieties. The synonyms I have introduced are not numerous; but they have been collated with care, and I trust may be relied on.

The Linnean genus *Juncus* includes a great variety of species. In the third edition of the *Species Plantarum*, eighteen are described, besides a great number of varieties. Murray has twenty-two; Gmelin thirty-five; Lamarck, in the *Encyclopedia Methodique*, thirty-two; Willdenow, forty; and Rostkov, fifty-two. Almost all the new ones belong to the true *Junci*; and it is fortunate for science that so numerous a tribe may be so naturally and easily subdivided: 1st, into those with leafless stems, including the original and true Rushes, beginning with *Juncus acutus* and ending with *J. filiformis*; 2dly, Such as have channelled leaves, embracing among the British species the Linnean bulbosus, bufonius, trifidus, and uliginosus; *J. squarrosus* belongs to this series, but does not follow any other species with a very close affinity; *J. trifidus* connects itself with the leafless subdivision by its entire want of leaves in some situations, and in some degree with the *Luzulae* by its fimbriated scales: it is nearly allied to *uliginosus*, with which it is linked by the *supinus* of Hoffman and Don's *Herbarium Britannicum*: 3dly, Those with jointed leaves succeed, a most distinct and natural family, connected with the last subdivision by *J. triglumis* and *biglumis*, which have cellular-knotted leaves, and ending in the new species, which were included by Linnaeus in his *articulatus*. This series, in order to connect it with the former, begins with those which are least complete in the joints of the leaves, and ends with such as have the most distinct and perfect articulations. It would seem, indeed, as if the channelled leaves of this genus were imperfect articulate leaves.

It is necessary to add a word or two in explanation of some terms I have used in my descriptions differently from some other botanists.
botanists. That which they have denominated the leaves of the true Junci, beginning with glaucus and ending with filiformis, I have regarded as barren stems, and for these reasons:—the species which are most nearly allied to them, having leaves, produce them from a membranous integument sheathing the base of the stem, as in J. acutus and maritimus. They are generally indeed setaceous, channelled, and of a totally different appearance from the culm which they accompany. Examples may be found in their congers J. bulbosus of Linnaeus, squarrosus, and bufonius; and in many plants more remotely allied, such as many of the Eriophora, Schæni and Scirpi. Of the last genus, some of the species produce leaves constantly, as Scirpus fluitans, acicularis, setaceus, &c.: others sparingly, as caespitosus; and others none at all, as palustris and multicaulis. But the manner in which the leaves are developed in Juncus trifidus and filiformis, shows in a satisfactory manner that the scales and the awns at the bottom of the stem of J. glaucus, and the other leafless species, are of the same nature as those in the plants just named. The scales, which are first produced at the base of the stem of J. trifidus, are awnless. As the plant advances the new scales become awned, and afterwards the awns of the following scales are successively enlarged, until at last a complete leaf is developed. The J. filiformis produces awns of the same peculiar nature; but they are seldom elongated into leaves. A similar structure is present in some of the Scirpi. The Nardus stricta, and many others of the Grasses, show at first, in the development of their leaves, the same unsuccessful attempts.

Linnaeus and his successors have described the panicle of J. acutus and maritimus as terminal, accompanied by a two-leaved, spinous, involucre; while they have called the panicle of J. glaucus, effusus, conglomeratus, and filiformis, lateral. This involves their descrip-
on the Genus Juncus of Linneus.

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descriptions in needless obscurity; and especially since no difference of organization is apparent among any of these species. Why the panicle of J. maritimus should be described as terminal, and that of conglomeratus as lateral, is irreconcilable with any theory of inflorescence which the Linnean terms countenance. If the elongation beyond the panicle be an involucral leaf in the one, it ought to hold good in the whole of the leafless subdivision. The more consistent and more natural method seems to be, to describe the panicle as lateral, where a similar structure of the stem is continued above the panicle as exists below it; and to denominate the spinous support at the base a bracte. Its analogy to a similar production in J. bulbosus, Linn., squarrosus, trifidus, and many of the Scirpi and Eriophora, where the support is indisputably called a bracte, justifies the opinion. The membranous scales at the base of the flowers are for convenience called flower-scales.

Specimens of the plants* here described accompany this Memoir.

**J U N C U S.**

R U S H.

*Cal. hexaphyllus. Cor. nulla. Caps. supera, trivalvis, trilocularis: loculamenta polysperma.**

*Culmo nudo.*

1. **J U N C U S A C U T U S.**


* These are deposited in the Museum of the Linnean Society.

**J. culmo**
Mr. J. E. Bicheno's Observations


In arenosis maritimis, præcipue cumulis, rariùs.

*Peren.* July.

Root fibrous, running deep into the sand. *Stem* three feet high, erect, straight, simple, leafless, cylindrical, even, terminating in a very sharp and rigid point. *Leaves* like the stem, but smaller and shorter. *Panicle* lateral, compound, many-flowered, first branch the longest. *Bracte* membranous, and dilated at the base, very pungent. *Flowers* clustered. *Calyx-leaflets* ovate, obtuse. *Capsule* broad-oval, somewhat three-sided, mucronate, shining, three-celled; each cell many-seeded. *Seeds* ovate, attached to the dissepiment, shining: *Coruncle* elongated at each end.

This plant and the following, though separated by the old botanists, have been considered as the same species by Linnaeus and many of his disciples. The character first applied by Lamarck—*capsula calyce duplo longiore*—is excellent; and by observing
serving this, and the large, shining, roundish capsule and blunt calyx, the botanist will be at no loss to distinguish the species. Sir James E. Smith, *Eng. Bot. l. c.*, conjectures that Homer, in his Battle of the Frogs and Mice, had this Rush in view as the weapon with which to arm his imaginary champions. It is not so common in England as the next species, and is not found in any country further to the North. It is one of those useful plants, which Providence has ordained to bind the loose sands of the shore together as a barrier to the ocean.

2. **Juncus maritimus**.

*Juncus* culmo nudo pungente, paniculâ laterali subproliferâ, bracteâ spinosâ, capsulâ oblongâ acutâ longitudine calycis.  

In paludibus maritimis copiosè, præcedentis socius.  
*Pern.* August.

*Root* fibrous, thick. *Stem* two feet or more high, leafless, erect, **glaucous,**
glaucous, rigid, tapering to a stiff point; sheaths at the base brown, polished, even. Panicle erect, decompound, as if proliferous, shorter than the stem; branches very unequal, the first much longer than the rest. Bracte membranous at the base, spinous, subulate. Flower-scales lanceolate, acuminate. Calyx-leaflets lanceolate, acute, zagged towards the point. Capsule linear-oblong, triangular, three-celled, light brown. Seeds ovate; coruncle elongated at each end.

The J. maritimus is a slenderer, lower plant, with an oblong and smaller capsule than the last. The panicle is also much more branched, the first branch far overtopping the others, and the calyx-leaflets lanceolate and acute. The two species cannot be mistaken if seen together when ripe. It is common on most parts of the coast; and, like the last, prevents the sea from making incursions on the land. The flower-scales in this species, and in most of the others, are very much disposed to become foliaceous.


Juncus aphyllus, paniculâ laterali erectâ angustâ, capsulis ellipticis acutiusculis calyce brevioribus.
J. effusus β. Huds. 149.
Peren. July, August.

Root creeping, black. Stem from one to two feet high, striated, glaucous, rigid, terminating in a sharp, tapering, frequently incurved summit; sheathed at the base with large, brown, shining scales. Panicle lateral, bursting about one-third the length of the stem below the top, erect, loose, branched. Calyx-leaflets striated, very acuminate; three inner leaflets shorter. Flowers hexandrous. Capsule elliptical, three-sided, narrower towards the top, mucronate, shining.

However easily distinguished this plant may be on examination, it is uncertain whether it was known to Linnaeus, although a production of Sweden, or he has included it in his J. inflexus, which no botanist since his time has understood. Willdenow has suffered the latter species to remain in his edition of the Species Plantarum, and adds from his own observation this remark: "Culmi suprema pars non est teres, sed folii ad instar compressus*." Sibthorp, who seems to have taken the J. glaucus up from Ehrhart (Gram. 85.), first introduced the trivial name into the British Flora. It may be known even at a distance from the soft Rushes, by its rigid stem, of a glaucous hue, and scanty panicle; and, on a closer view, by its pointed capsule. Wahlenburg (Flor. Lapp. p. 79.) says of those specimens he found in Lapland, that the flowers were larger than those figured in English Botany.

* The authors of the Flore Française, vol. v. have expressed their opinion that the J. inflexus of their third volume is nothing more than J. glaucus; adding at the same time, that the real J. inflexus, Linnaeus has but three stamens.

2 R 2 4. JUNCUS
4. **JUNCUS CONGLOMERATUS**

**Juncus aphyllus**, paniculâ laterali conglobatâ, floribus triandris, capsulis retuis.


In pascuis et ad vias, locis humidioribus.

**Peren.** July, August.

**Root** horizontal, creeping, fibrous. **Stem** two feet high, sheathed at the base with large black scales, minutely striated, very acute, but not pungent. **Panicle** lateral, many-flowered, densely conglomerate. **Calyx-leaflets** lanceolate, two-nerved. **Stamens** three. **Stigma** very much fringed. **Capsule** obovate, retuse, almost three-lobed, about as long as the calyx.

The dense panicle distinguishes this species at once from its congeners. It is used in common with *J. effusus* to make the wicks of rush-lights, pith in toys, mats, little baskets, chair-bottoms, ropes and lines. Mr. White in his *Natural History of Selborne*, (Letter 26.) has given a pleasing account of its uses to the thrifty housewives of Hampshire. Rushes are employed by
on the Genus Juncus of Linnaeus.

the cleanly peasantry to strew their floors; and Shakespeare, whose observation was alive to the most insignificant incidents, has many allusions to this custom.

5. JUNCUS EFFUSUS.

JUNCUS aphyllus, paniculâ laterali effusâ supradecompositâ, capsulis turbinatis apice subtruncatis.
J. culmo nudo stricto, paniculâ laterali supradecomposita effusa, capsulis clavatis apice truncatis. Rost. Monograph. 10.

J. lœvis vulgaris, paniculâ sparsâ, nostras. Raiti Syn. 432.
J. lœvis vulgaris, paniculâ sparsâ, major. Park. 1191. 2. Moris. s. vili. t. 10. f. 4.
J. lœvis. Ger. Em. 35.

In pascuis humidis, copiosè.

Peren. July, August.

Root creeping, black. Stem two feet or more high, pale-green, soft, pliable, very finely striated. Panicle effuse, divaricate, very much branched, with numerous flowers. Calyx-leaflets subulato-lanceolate, acuminate, two-nerved. Flowers frequently triandrous. Capsule small, obovate, slightly retuse, nearly truncate, pale brown, with no persistent style.
This plant is better adapted than the last for use in all the little arts of weaving and plaiting:—

"Viminibus mollique detexere junco."

It is cultivated in Japan for the purpose of making mats of an extremely delicate texture, which are used in the place of carpets. Both this and conglomeratus indicate a better soil where they grow than glaucus. From the latter it is easily separated by the absence of the glaucous hue about the stems, and the obtuse capsule: and its effuse and decompound panicle at once distinguishes it from J. conglomeratus. There are intermediate appearances when young, between effusus and conglomeratus, which are most easily disposed of by observing the distance the panicle breaks forth from the summit; the former having frequently one-third of the stem above the panicle, while the latter has not more than three or four inches. When further advanced, the shape of the capsule is a sure criterion. The J. laevis alter of Moris. s. viii. 231. 5. is probably nothing more than this "brevior et crassior."

6. JUNCUS FILIFORMIS.

Juncus aphyllus, culmo filiformi nutante, paniculâ laterali subsimplici pauciflorâ, capsulis subrotundis.


J. culmo filiformi nudo, paniculâ brevissimâ pauciflorâ laterali. Lamarck Encycl. iii. 254.

J. culmo
on the Genus \textit{Juncus} of Linnaeus.


\textit{Angl.} \textbf{Least Rush.} Thread-form Rush.

In irriguis alpinis, inque Anglia præcipuè ad ripas lacuum borealium.

\textit{Peren.} July, August.

\textit{Root} creeping, horizontal, fibrous. \textit{Stem} soft, generally a few, rarely ten inches high, very slender, tapering towards the summit, frequently drooping, sheathed at the base with scales, which are light-brown, obtuse, remarkably awned. \textit{Panicle} from three- to eight-flowered, nearly simple, remarkable for bursting from about the middle of the stem. \textit{Flowers} sessile, supported by a small bracte. \textit{Fruit} peduncled. \textit{Calyx-leaflets} lanceolate, acute, very nearly equal; keel three-nerved. \textit{Capsule} globose, about the length of the calyx.

This plant has never been found in England, excepting on the margin of the lakes in the North, being a similar situation to that in which it is found on the Continent. Pursh states it to be frequent in boggy mountain-meadows in North America. Its diminutive size, and long slender summit above the panicle, sufficiently mark its character; though in habit it approaches very nearly to the two last described. Indeed, I anticipated a closer resemblance when I found three stamens to be common to both the other soft Rushes \textit{conglomeratus} and \textit{effusus}; and I examined numerous fresh specimens of \textit{filiformis}, with the view to discover the same numerical structure, but could never observe it. The small awn at the point of the radical sheaths appears to be an attempt towards the
Mr. J. E. Bicheno’s Observations

the production of leaves; a circumstance which is seen more completely developed in *J. trifidus*. The English name, by which it is generally known, is objectionable on account of its having been applied by the old botanists to *Scirpus setaceus*; but it is better to retain the commonly-received name, if it is at all tolerable, than to introduce a new one.

**Folia canaliculata.**

7. **Juncus squarrosus.**


In montosis et ericitis sterilibus, præcipue solo spongioso, copiosè.  *Peren.* June, July.

Root fibrous.  *Stem* a foot or more high, straight, rigid, striated, leafless.  *Leaves* in tufts, setaceous, channelled, rigid, pointed, smooth, dilated and sheathing at the base, not half so long as the

This plant fully justifies the proverbial worthlessness of the Rush. It indicates a most unprofitable soil, and is well known from the harshness of its herbage. Lime is recommended by agriculturists as the means of destroying it. What relation it has to Geese in Ray’s English name I know not; excepting, indeed, that they may frequent some places where it grows. The figures in Ger. 18. 4. Gramen juncceum maritimum, which Ray quotes with a doubt, and in Ger. em. 21. 4., copied by Parkinson, p. 1270., although referred to this plant by modern authors, cannot be cited with any certainty, since they have the male spikes of a Carex delineated at the top, and the capsules bear little resemblance. The leaves and root, indeed, are faithfully represented. This species has but little affinity with any other; and, when once known, is not likely to be mistaken.


Juncus culmo simplici folioso compresso, foliis linearibus margine incurvis, capsulis rotundis calyce longioribus, paniculâ terminali bracteâ breviore.


J. bulbosus, culmo folioso simplici compressiuseculo, foliis canaliculatis, corymbo terminali foliis floralibus breviore, capsula subrotunda obtusa petalis longiore. Rost. Monograph. 23.

J. bulbosus, culmo compresso indiviso, foliis linearibus canaliculatis, corymbo terminali, calycinis foliolis obtusis, capsula subrotunda obtusa brevioribus. Willd. ii. 213.


*Habitat* in pascuis humidis.

*Peren.* July, August.

Root creeping, horizontal, fibrous, not bulbous. *Stem* erect, from six to twelve inches high, simple, cylindrical at the base, compressed upwards, smooth, leafy, particularly at the base. *Leaves* linear, channelled, dilated and involute at the base, striated. *Panicle* inclining to a corymb, compound, many-flowered, the first branch longer than the others. *Bractes* foliaceous, channelled; the lowermost longer than the panicle. *Calyx-leaflets* obtuse, brown, scariose at the edge, shorter than the capsule. *Capsule* rotund, very obtuse, mucronate.

I have ventured to separate Linnaeus's *Juncus bulbosus* into two species, and to abolish the trivial name altogether, in consequence of the confusion of synonyms that it has occasioned, and its total want of appropriateness. The plant bearing this name in the first edition of the *Species Plantarum*, is the *uliginosus* of Smith and of the present paper (which has a bulbous root), as appears from the remarks of Ehrhart; and the transfer of it in the succeeding editions to the present plant, seems to have originated in an oversight of the illustrious Swede. The name given by Jacquin is very
very significant; for which reason I have adopted it. I think there can be little doubt of the figures which I have quoted belonging to this species, though that in Eng. Bot. has the capsule badly represented, and more like J. bottnicus of Wahlenburg. J. compressus is to be distinguished from J. caenosus, the next species, by its lighter colour, broader and more concave leaves, the capsule being longer than the calyx, and the lower bracte longer than the panicle. The leafy stem and blunt calyx-leaflets are sufficient marks to separate it from the rest of this subdivision. It is generally an inland plant; whereas caenosus is confined to the shore. The authors of the Flore Française seem to have observed the difference of the two plants, and have, I conceive, described the sea-shore species under their bulbosus, and the inland one under J. Gerardii, v. 5. p. 308.


Juncus culmo simplici folioso, foliis setaceis canalicularis, capsulis obovatis obtusis longitudine calycis, paniculâ terminali subsimplici bracteâ longiore.

Angl. Mud Rush.

Habitat in salsis copiosè.

Peren. July, August.

Root creeping, fibrous. Stem from two inches to a foot high, erect, leafy, simple, smooth. Leaves setaceous, channelled, slightly striated. Panicle inclined to a corymb, terminal, erect, few-flowered, longer than the bracte. Bracte at the base of the panicle setaceous. Calyx-leaflets obtuse, dark chocolate-coloured, as long as the capsule; three inner leaflets scariose at the margin. Capsules somewhat unilateral, obovate, very obtuse.

I rely principally on the shape of the capsule, the proportion it bears to the calyx, the more rigid nature of the stem and leaves, the length of the bracte, and the altogether darker colour of the plant,
Mr. J. E. Bicheno's Observations

plant, as marks to distinguish this from the preceding species. It is very plentiful in those places on the coast subject to be overflowed by the sea, and varies very much in size. Virgil's epithet, "limosus juncus," applies to most of this family, but to none more forcibly than this. The Flor. Dan. figure 431, and Morison's sect. viii. t. 9. f. 11. resemble this more than the last. The names of Lob. 18., Ger. 18.1., Ger. em. 21.4., and Park. 1270.6., correspond much better with J. caenosus than with J. squarrosus; and indeed Ray, in the first edition of his Synopsis, so applied them; but was afterwards induced to change his opinion by the observations of Dr. Plukenet (vid. Philosophical Letters of Ray, p. 232.), who says, "I must needs acknowledge that I am not a little entangled in my thoughts about the Juncus parvus cum pericarpiis rotundis, J. B., which though you are pleased to make the same with the Gram. junc. marit. Lob., I cannot easily obtain with myself a compliance herein, but do rather accept it as the Juncus acutus Cambro-britannic. Park., and which I take to be a true and genuine Rush, as you most truly have observed. But unto this you are pleased to apply the Junc. Cambro-brit., Park. (h. e.), Gr. junc. maritim., Lob., whose Icon of it (and indeed so do those of all other authors) agrees exactly with our Moss-Rush, the capsules whereof are somewhat elongated and pinched in towards the top, resembling more a cone than a globe, the capsules of the former being more accurately round, according as its name imports." Ray, however, in his second edition of the Synopsis, states, that though he agrees with Dr. P. in rejecting the synonyms of Bauhin, which he had before quoted, he could not assent to this being the Juncus acutus alpinus Cambro-britanicus, Park. It induced him, nevertheless, to omit this synonym under J. squarrosus, to which, in the first edition, he had appropriated it—a change which I cannot but think was erroneous. If the distinction of the two plants J. compressus and caenosus be admitted,
on the Genus Juncus of Linnaeus.

the difficulty, perhaps, may be explained; since the synonyms of Bauhin are all applicable to the latter species, and the figures of Gerard, C. Bauhin, Parkinson, and Johnson are not to be depended on, seeing that they represent the male spike of a Carex terminating the panicle, and that Gerard's is the only original figure among them, the rest being merely copied from him. Vail-lant (Botan. Paris. 109, 110.) has arranged the synonyms of the old authors, as far as relates to J. squarrosus and bulbosus Linn. in a more satisfactory manner than any person I have consulted.


Gramen juncum parvum sive Holostium Matthioli. Park. 1190.

Gramen juncum. Ger. 4. Ger. cm. 4.


Gramen juncum minimum, Holosteo Matthioli congner. Park. 1270.

Habitat in humidis et aquosis.

Ann. June, July, August.

Root fibrous. Stems from an inch to a foot high, numerous, dichotomous, upright, cylindrical, smooth, striated, leafy. Leaves linear, channelled, acute, dilated at the base, not jointed. Flowers solitary, rarely in pairs, sessile, erect, growing in somewhat of a spike on the terminating branches. Calyx-leaflets setaceous, acuminate, with the keel green and the remainder scariose. Bractes ovate, scariose. Capsules elliptical, rather obtuse, shorter by half than the calyx. Seeds very numerous.

The solitary flowers and long silky calyx sufficiently mark the character of this species. Like others of its congeneres, it is occasionally gemmiparous. It is subject to great variation in size, owing to the soil in which it grows. Sometimes it may be observed on a sandy coast not an inch high, with a capsule not quite obtuse; at other times, in a richer soil, where water has stood during the winter, it may be seen shooting into a long simple culm exceeding a foot in height. The var. β is thus described by Dillenius: "Priori simili (i. e. the common one), sed multo minus, et minus ramosum, coloris plerumque rubentis: florendi etiam tempore differt, nam mensis et sesquimensis spatio illud antecedere solet." I could never perceive that it was worth much attention. The old botanists, from whom Linnaeus adopted his trivial name, imagined some affinity to exist between this species and the toad, because this animal inhabits similar places. A seedling plant is figured in Rose's Elements of Botany, Appendix, t. 2. f. 5. A. and B.

The Juncus gracilis, published in Eng. Bot. xxxi. 2174., has an inflorescence and fructification the most like this, but that has broader and emarginate valves to the fruit.


Habitat in paludibus alpinis Scoticiis, rarius.

Peren. July.

"The Root consists of woolly fibres, and has the appearance of being perennial. Stem very slender, a foot or more in height, naked, except at the base and summit. Radical leaves but one or two, much shorter than the stem, narrow, flat, slightly thickened, or somewhat involute, at their edges, not channelled. The top of the Stem terminates in a few racemose forked branches, with two or three leaves at the base. Flowers solitary, mostly sessile. Calyx-leaves sharp-pointed. Valves of the Capsule blunt and emarginate.

"Found by Mr. G. Don in 1795 or 1796, by the side of a rivulet in marshy ground, among the mountains of Angus-shire, but very rarely. It appears to us to be a nondescript: but we received from Mr. Dickson, some years before the above date, a specimen not so far advanced towards maturity, of what seems to us the same species.

"The inflorescence and fructification of this Rush come nearest to bufonius, t. 802.: but the fewness of the flowers, taller stem, and flatter leaves, as well as the broader and emarginate valves of the fruit, serve well to distinguish it; not to mention the probably perennial root. Eng. Bot. l. c."

This species is unknown to me, except from the description I have here quoted. I may however add, that it is not the gracilis of Roth Germ. i. 155. ii. 402., which is J. capitatus, Willd.; nor of
of Brown's *Prod. Flor. Nov. Holl.*; and whose name, therefore, being first applied to another species, ought to take precedence of that in *Eng. Bot.* Plants brought from the Cambridge garden as authentic specimens are, I think, a variety of *J. pygmaeus* of the French botanists; but they are so unlike the figure in *English Botany*, that I cannot persuade myself but that there is some mistake.

### 12. *Juncus trifidus.*

*Juncus* culmo nudo, capsulæ oblongâ calycem æquante, bracteis foliaceis canaliculatis floribusque tribus terminalibus.


*Peren.* July.

*Root* creeping, fibrous. *Stems* very numerous, from a few inches to a foot in height, filiform; at the base sheathed with numerous awned brown scales, which are terminated abruptly with a membranous and fringed border; awns in the upper scales more or less leafy. *Flowers* from one to three, terminal, accompanied by three foliaceous channelled bractes, two of them near the flower, the third sometimes at a distance, membranous at their base, fringed at their border. *Calyx-leaflets* scarcely so long as the capsule. *Capsule* oblong, large, shining, acuminate; cells few-seeded.

Lightfoot says that he found the Scotch specimens all with a single flower, corresponding with Jacquin’s *J. monanthos*. On the
the contrary, Wahlenburg informs us that he never met with the one-flowered variety in Lapland. It is also worthy of remark, that Linnaeus's plant does not produce radical leaves; whereas ours possesses them more or less, showing at the same time by the awn, which terminates the scales, many fruitless attempts at perfecting them, though they are more completely produced at every new effort. It is the connecting link between the *Junci* and the *Luzulae.* "Mira omnino mihi videtur species," says Wahlenburg, *Flor. Lap.* 81, "ad radicem prorsus aphylla. Radix repens culmos multos fasciculatos exserens squamis tantum brevibus interstinctos. Vaginae culmi basin vestientes brevi mucrone ornatae, de cætero in fimbrias partitae. Folium in suprema parte culmi plerumque adest, bracteis simillimum; ligula fimbriata alba. Bracteæ canaliculatae; marginibus serrulatis. Semina in singula capsula paucâ: de cætero quoque structura capsulae inter Juncum et Luzulam ambigit. Capsula oblonga. *J. monanthos,* Jacq. differre mihi videtur: foliis radicalibus; et capsula ovali, duplo majore, calycem excedente."

13. **JUNCUS ULIGINOSUS.**

*Juncus,* foliis setaceis canaliculatis, floribus ternis sessilibus, capsulâ obtusâ calycem excedente, culmo bulboso radicante.  
Gramen junceum capsulis triangulis minimum. *Moris.* s. viii. t. 9. f. 3.  
Gramen junceum minimum, paniculis foliaceis. *Moris.* s. viii. 
t. 9. f. 4.
G. junceum aquaticum paniculis cum foliis capillariibis. *Pluk.* 
Phyt. t. 32. f. 3.
Juncoides calyculis paleaceis, glomeratis folio varians. *Scheuch.* 
Agrost. 330. t. 7. f. 30.
γ. culmo longiore, foliis caulinis subnodoso-articulatis, capitulis 
proliferis.
J. fluitans, culmo bulboso tenui radicante, foliis setaceis sub-
nodoso-articulatis, capitulis trifloris subproliferis. *Lamarck* 

*Angl.* Bulbous Rush. Little bulbous Rush. The least tri-
angular-seeded Rush.

*Peren.* July, August.

*Habitat* in ericetis humidis arenosis, vel turfosis; γ in stagnis.

*Root* fibrous. *Stem* bulbous at the base, erect, leafy, slender, 
branched upwards; branches divaricate. *Leaves* setaceous, 
smooth, channelled, cellular; cells in a double row, the par-
titions of one being opposite to the middle of another in the 
corresponding series; in γ some are articulate. *Flowers* three 
together, lateral and terminal, sessile. *Bractes* small, scariose, 
shorter than the flowers, excepting in the viviparous variety as it 
is improperly called, in which they are lengthened out like the 
leaves. *Calyx-leaflets* all of the same length, scariose at the 
edge, chocolate-coloured; keel green. *Capsule* three-sided, 
obtuse, opake, somewhat longer than the calyx.

This plant has, till lately, been in a very unsettled state, as 
may be seen by the numerous synonyms quoted by most authors. 
It is not readily distinguishable in some states from other species; 
but
but its blunt capsule will enable the botanist to separate it from *J. lampocarpus* and *acutiflorus*; and, besides the diagnostic marks mentioned under *supinus* and *subverticillatus*, the opake chocolate-coloured calyx and capsule are very constant characters. This is Haller's 1320, which he says he received from Dillenius as his *Gramen junceum capsulis triangulis minimum*; so that this clears up all doubt about the synonym; and most probably the *J. supinus* of the *Flore Française* iii. 168. The var. *β* has its little flower-heads more or less foliaceous and gemmiparous,—a monstrosity to which this and its near affinities are very liable. Wahlenburg, *Fl. Lap.* 82., suspects, erroneously, the figure of it in *Eng. Bot.* t. 801. to be the *acutiflorus* of Ehrhart, and of the present paper. The var. *γ*, which is not uncommon, is very likely to prove a species.

14. **Juncus supinus**.

*Juncus* foliis canaliculatiss filiformibus, capitulo trifloro terminali secundo, bracteis setaceis foliaceis.


*J. subverticillatus β. Willd. ii. 212.*

**Angl. Dwarf Rush.**

*Habitat in uliginosis.*

*Peren. July.*

*Root fibrous, bulbous at the base. Stem erect, simple, two or three inches high. Leaves filiform, channelled, cellular. Flowers*
three together, terminal, clustered. *Bractes* setaceous; one or more frequently foliaceous, longer than the flowers, and forcing them on one side. *Calyx-leaflets* lanceolate, chesnut-coloured. *Capsule* oblong, rather obtuse, three-sided, not quite so long as the calyx.

The synonyms I have quoted may I think be depended on. The figure in *Flor. Dan.* 1099. represents the plant stronger than it usually is; and in which case it occasionally produces branches of lateral flowers, but in its more common state they are only terminal. Bauhin, in his *Hist.* ii. 523., has probably described and figured this species under his *Juncus foliatus minimus*. The synonym brought from Symon's *Synopsis* is determined by authentic specimens in the herbarium of my friend Mr. Edward Forster, F.L.S., which formerly belonged to Hudson, and from which the character and description in that little work were drawn up.

Mr. George Don, who has the merit of first pointing out the species as of British growth, makes the following remarks: "I observed this plant, in October 1804, by the side of a rivulet near the summit of Ben Lawers, in a situation where the snow remains the greater part of the year, and not far from the spot where I first discovered the *Juncus castaneus* in May 1794, at which time the first-mentioned place was covered with snow. I have cultivated the plant, and carefully compared my specimens in their different appearances with the figure in *Flora Danica*, which I consider as a just resemblance of this variable plant. The leaves which accompany the flowers, where they become terminal, give the plant the appearance of being viviparous. The plants, which I have cultivated, flowered in July; but in their native place they do not probably show their flowers earlier than August or September." *Don's Herb. Brit.* fasc. v. 85.

This plant, to say the least of it, appears very different from the rest. Its near approach to *uliginosus*, and the strong disposition there
there is in the bractes of all the species to become foliaceous, induces me to hesitate. The German botanists, however, whose acuteness is not often to be surpassed, continue to admit it as distinct. It is very small, not exceeding generally one or two inches in height. I met with it in boggy ground about Ambleside.

*** Folii articulatis.

15. Juncus triglumis.


J. gluma triflora culmum terminanti. Flor. Lap. 115. t. 10. f. 15.

Juncello accedens graminifolia plantula capitulis Armeriae proliferæ. Raii Syn. 430.


Habitat in locis uliginosis et irrigatis, rariüs.

Peren. July, August.

Root fibrous. Stems four to six inches high, erect, straight, cylindrical, leafy only at the base. Leaves subulate, compressed, sheathing, somewhat jointed; cells like those of J. uliginosus.

Flowers terminal, erect, nearly sessile, generally three together. Bractes oval, concave, nerved, bright brown, membranous; two
outer ones largest, not longer than the flowers, and opening so as to let them stand all on the same plane. *Calyx-leaflets* lanceolate, equal, blush-coloured at the tips. *Style* very short. *Capsule* elliptical, mucronate, somewhat obtuse, three-sided, scarcely exceeding the calyx. *Coruncula* elongated at each end of the seed.

This is not so rare a plant with us as the *J. biglumis*, being found in the mountainous districts of Wales and of the North of England, as well as in Scotland. I have met with it on Helvellyn, on Fairfield, and most of the other mountains about Ambleside, and at the edge of Scales Tarn in Saddleback. Dillenius mistook it for a variety of *Scirpus caspitosus*. The leaves instead of being flat, as described in the specific character by every botanical author but Haller, Wahlenburg, and Brown, are constructed with cells in a similar manner to those of *J. uliginosus*; and the articulations are much more susceptible to the touch on drawing a leaf between the thumb and finger—"Semper tam angusta et teretiuscula reperi, ut jure meritoque subulata dici possunt." *Flor. Lap. Wahlen. 84.*

16. **Juncus biglumis**.


*Habitat*
on the Genus Juncus of Linnaeus.

Habitat in locis irriguis summarum alpium, rarissimè.
Peren. August.

Root fibrous. Stem three or more inches high, leafy, simple, striated. Leaves compressed, jointed, erect, sheathing, pointed. Flowers terminal, binate, unilateral, one above the other; upper one on a short footstalk. Bractes two; larger one foliaceous, erect, forcing the fruit on one side. Calyx-leaflets lanceolate, pointed, equal, keeled, chocolate-coloured. Stamens longer than the calyx. Capsule large, turbinate, retuse, chocolate-coloured above, longer than the calyx. Seeds numerous; appendage elongated at each end.

This rare plant has been found with us only in Scotland, particularly on Ben Lawers in Breadalbane. The old botanists were unacquainted with it; and even Lightfoot suspected it might be a variety of J. triglumis. The two species are, however, perfectly distinct, and may be recognised at once by observing that one of the bractes in J. biglumis is much longer than the flowers, and the capsule turbinate. The seeds are remarkably distinguished by their covering.

17. Juncus castaneus.


Habitat in alpibus Scotiæ, solo micaceo udo.
Peren. July.

Root creeping, with runners. Stem erect, straight, from six to twelve inches high, cylindrical, solitary, leafy. Leaves principally on the stem, alternate, erect, compressed, jointed above; sheathing, folded and dilated at the base so as to make a sharp keel. Heads terminal, erect, one above the other, from three
to eight-flowered, shining, nearly black. *Bractes* membranous, linear-lanceolate, acuminate. *Calyx-leaflets* lanceolate; outer ones longer and more acute than the inner. *Stamens* the length of the calyx. *Style* persistent, of about the same length as the stigmas. *Capsule* oblong, pointed, three-celled, black, longer than the calyx. *Seeds* numerous in each cell; appendage subulate at each end.

The first botanist of whom we have heard who took notice of this new species, was Dr. Steuart. He gathered it on Ben Chal-lum. Mr. Dickson brought it from Ben Lawers; and it was published first under the name of *J. Jacquini* in Symon’s *Synopsis Plantarum Insulis Britannicis Indigenarum*, &c. Others have mis-taken it, in the same way; and I am afraid that the draughtsman of the figures in *English Botany* has fallen into the error. *J. Jacquini* has the lower bracte with a long filiform summit, very acuminate calyx-leaflets, very short stamens, and one leaf on the stem. It belongs to that division of the genus which has channelled leaves; while *J. castaneus* is an articulate-leaved species. In addition to the habitats before mentioned, I have it gathered by Mr. Borrer, in Fion Glen in Breadalbanc.

18. *Juncus subverticillatus*.

*Juncus* foliis caulinis subulatis nodoso-articulatis, paniculâ corymbosâ, capitulis subquinquefloris fasciculato-verticillatis, capsulâ obtusâ calycem striatum æquante.


Angl. Whorled Rush.

Peren. July, August. Stem
Stem a little bulbous at the base, decumbent, striking root at the joints, generally a few inches in height, cylindrical, fistulous. Leaves at the root filiform, articulate; those of the stem larger, subulate, knotty-jointed, brittle, springing from a large scariose sheath. Flowers in a corymb, as if proliferous, fasciculato-verticillate, light-brown. Calyx-leaflets lanceolate, acuminate, striated, rigid. Capsule obtuse, light-brown, not longer than the calyx, somewhat shining, mucronate.

Though I am not enabled to ascertain many modern synonyms with certainty for this common plant, I feel confident that it will be found on examination to be a good species. The French botanists give it the above name in their herbaria. Rostkov, Willdenow, and most others seem to have considered the *J. uliginosus* of Smith and this to be the same. Sibthorp's description of *uliginosus* corresponds so nearly with it, that I think he had an eye to it in drawing up his specific character—"Floribus fasciculatis, fasciculis proliferis, foliis setaceis articulato-nodosis." Withering's definition is also applicable to this. Haller's no. 1321. is most likely intended for it—"Foliis sessilibus articulatis, panicula simplici, glumis aristatis." And Parkinson's figure 1189 tolerably corresponds.

### 19. Juncus Acutiflorus.

*Juncus* foliis nodoso-articulatis, panicula terminali supradecomposita, calycis foliolis omnibus lanceolatis acuminatis capsulam acuminatam æquantibus.

*J. foliis compressiusculis panicula terminali supradecomposita diffusa, calycis foliolis omnibus lanceolatis acuminatis, capsule ovato-oblonga triquetra mucronata, culmo 3—4-folio. Davies, Linn. Trans. x. 13.

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J. sylvaticus, culmo erecto, foliis nodoso-articulatis teretibus, panicula composita, foliolis calycinis aristatis interioribus longioribus. Willd. ii. 211.


Gramen junceum articulatum palustre erectum et elatius. Moris. s. viii. t. 9. f. 2.

Gramen junceum sylvaticum sparsa panicula. Park. 1189. 5.

Gramen junceum aquaticum magis sparsa panicula. Park. 1269. 4.

Gramen junceum sylvaticum. Ger. Em. fig. 22?


Habitat in sylvis humidis et aquosis.

Peren. June, July.

Root fibrous, creeping. Stems two or three feet high, slender, erect, compressed, smooth; joints fistulous. Leaves three or four on a stem, sheathing, compressed, smooth, knotty-jointed. Panicle terminal, very much divided, diffuse; branches long, slender, smooth. Calyx-leaflets all acuminate and of a similar consistence. Capsule three-sided, ovate-oblong, acuminate, light brown, a little shining, about the length of the calyx.
This is unquestionably a good species, and the Rev. Hugh Davies's remarks leave me nothing to add to the diagnostic description. "The panicle of this is more branched than that of the last, the branches more slender and spreading, the divisions of the calyx narrower and longer, the capsule smaller, much more taper-pointed and lighter-coloured; culm of fewer joints, that and the leaves less compressed. It is a taller plant, sometimes above three feet high, and it ripens later." I cannot persuade myself that Ray did not intend this species and not *obtusiflorus* by his *J. nemorosus folio articuloso*; since in his *Hist. Plant.* he quotes *Ger.* 20. 10. (a most excellent representation of the *obtusiflorus*) with a doubt.

20. *Juncus lampocarpus.*

*Juncus* foliis compressis, paniculâ terminali compositâ erectâ, calycis foliolis tribus interioribus obtusiusculis, capsulâ acuta triquetrâ nitidissimâ.


*J. articulatus*, culmo adscendente, foliis nodoso-articulatis compresso-teretiusculis, panicula composita, foliolis calycinis aquabilus obtusiusculis. *Willd.* ii. 211.


2 u 2

*J.* foliis

J. foliis articulosis floribus umbellatis. Rauj Syn. 433.

Gramen juncemum articulatum palustre humilius utriculis frequenter donatum. Moris. s. viii. t. 9. f. 2.

Gramen juncemum aquaticum Bauhini folio articulato et cem utriculis. Park. 1270. 5.


Habitat in locis uliginosis et paludosis.

Peren. July, August.

Root creeping. Stem about a foot high, compressed, many-leaved, slightly striated. Leaves compressed, sheathing, distinctly jointed, rigid, pointed. Panicle terminal, erect; branches stiff, elongated, nearly simple. Flowers five or six together, sessile. Calyx-leaflets shorter than the capsule; the three inner somewhat longer, and with a more obtuse and membranous edge than the outer ones. Capsule larger, oval, triangular, chocolate-coloured, varnished, acute, terminated by the persistent style.

This plant in an advanced state is easily known from J. acutiflorus and obtusiflorus by its large, shining, dark capsules. While early in flower, the best marks are the more simple panicle and the somewhat obtuse calyx. It is subject to become foliaceous in the flower-scales; in which state C. Bauhin has figured it, Prod. 12., and Parkinson has copied it, 1270. Gramen aquaticum, Ger. 12. 1. and Ger. Ein. 13. 1., which are usually referred to this species or the following, are more likely, judging from the panicle, to be Alisma Plantago, drawn as it appears after having seeded. This I have but little doubt is Linneus's articulatus; for though his description "petalis obtusis" is not so applicable to this species as
to obtusiflorus, yet, as compared with acutiflorus, it is sufficiently characteristic. His synonyms are quite consistent with this opinion. This by the old botanists was called the aquaticus, while the acutiflorus was called sylvaticus. Linnaeus himself makes this distinction in his Systema Naturae. We are indebted to the Rev. Hugh Davies for making them intelligible to the English botanist.

21. **Juncus obtusiflorus**.

*Juncus* foliis teretibus nodoso-articulatis, paniculâ supradecompositâ divaricatâ, calycis foliolis ellipticis obtusis capsulae longitudine.


*J. foliis teretibus, panicula terminali supradecomposita divaricato-refracta, calycis foliolis ellipticis obtusis, capsula ovato-acuminata triquetra, culmo bifolio. Davies, Linn. Trans. x. 13.*

*J. foliis nodoso-articulatis, floribus obtusis. Ehrh. Gram. 76.*


*Gramen junceum sylvaticum. Ger. 20.*


*Habitat in stagnis et aquosis, non vulgaris.*

*Peren. July, August.*

*Stem erect, two or three feet high, smooth, even, cylindrical, divided into cells between the joints, bearing usually two leaves. Leaves rigid, jointed, cylindrical, smooth, pointed; joints cellular. Panicle terminal, very much branched; branches repeatedly compound, entangled one with the other; ultimate branchlets frequently refracted. Flowers small, lateral and terminal,*
terminal, collected into little heads. *Calyx-leaflets* elliptic, all obtuse, as long as the capsule; margin broadly scariose; keel brown. *Capsule* light-brown, shining, small, oval, mucronate, three-sided, three-celled.

The pale much branched panicle distinguishes this at first sight; and, upon closer examination, the obtuse calyx-leaflets, which are as long as the capsule, and the jointed stem having only two leaves, afford further marks for discrimination. This is no doubt what Gerard has figured *p. 20. f. 10.* and which in Johnson's edition is changed for *acutiflorus*; and it is what Ray, in his *Hist. Plant.* *p. 1307. 4.* has described as a variety of the same plant:—"*Cum planta,*" he says, "*in aquosis et humidioribus nascitur, majis sparsa et pluribus capsularum agminibus composita quàm in præcedente. Quamvis autem planta ipsa major et elatior sit quàm illa, capsules tamen seminales minores sunt, nec adeò obscure nigricant." It is also Ray's plant, mentioned in his *Synopsis,* 2d ed. *p. 276.*, where he says, after describing *acutiflorus,* "*Secunda species elatior et major est, paniculâ majis sparsâ, capsules tamen minoribus minusque coloratis quàm in illa.*" Dillenius understood the expression "*secunda species*" to refer to the second species of the subdivision in which the plant is placed; whereas Ray meant the *second* as following that he was then describing, which was *acutiflorus.* Thus, in the third edition (in which the species are differently arranged,) Dillenius, speaking of this plant, says, "*Priori elatior et major est, panicula majis sparsa est,*" &c. &c., applying these words to *J. lampocarpus,* which was the second species of the second edition, and which he in his new arrangement had placed next before *acutiflorus.*

**LUZULA.**
on the Genus Juncus of Linnaeus.

LUZULA.
WOODRUSH.

Cal. hexaphyllus. Cor. nulla. Caps. supera, trivalvis, unilocularis, trisperma.

1. LUZULA PILOSA.

Luzula paniculâ cymosâ divaricatâ, floribus lateralisibus sessilibus solitariis, seminis corunculâ uncinati.

L. foliis planis pilosis, corymbo terminali subcomposito, pedunculis unifloris nutantibus, petalis ovatis capsula brevioribus.


L. vernalis, foliis pilosis, corymbo subsimplici, pedunculis unifloris nutantibus, perigonii lobis ovatis acutis, capsulis obtusis.

Decand. Flor. Gall. 151.

Juncus pilosus, foliis planis pilosis, corymbo sub simplici, pedunculis unifloris nutantibus, petalis ovatis capsula brevioribus ovatis acutis.

Willd. ii. 216. Rost. Monograph. 25.

J. pilosus, foliis planis pilosis, panicula cymosa divaricata, floribus solitariis.


Gramen hirsutum latifolium majus. Moris. s. viii. t. 9. f. 1.
Gramen nemorum hirsutum majus. Park. 1184.


Habitat in nemorosis et dumosis, vulgaris.


Root fibrous, stoloniferous. Stem from 6 to 12 inches high, slender, cylindrical,
cylindrical, simple, leafy. *Leaves* linear-lanceolate, plane, nerved, acute; the margin, especially towards the base, clothed with very long, white, soft hairs: radical leaves very numerous and large. *Panicle* terminal, cymose, somewhat branched, divaricate: ultimate branches reflected. *Flowers* solitary, terminal and lateral; lateral ones sessile. *Bractes* two to each flower, membranous, acute. *Calyx-leaflets* lanceolate, acuminate, dark-brown, with a scariose margin. *Filaments* very short. *Capule* one-celled, three-sided, inversely heart-shaped, obtuse, suddenly narrower towards the middle. *Seeds* three, shining, chocolate-coloured; coruncula lengthened at the top, hooked, twisted, all three meeting at the insertion of the pistil. *Vid. Tab. IX. f. 1.*

The peculiar shape of the coruncula will at once enable the botanist to distinguish this plant from all its congeners; but when that cannot be seen, the divaricate and dark panicle will generally suffice to separate it from *L. Forsteri*; and the solitary flowers prevent it from being confounded with the rest of the British species. The marginal hairs of this genus are singularly constructed, being composed of a number of smaller fibres, which are jointed and twisted; so that upon the application of moisture, in a dry day, as in the case of the awns of *Avena*, they untwist themselves.

This plant has no known medicinal or agricultural use. Its dry tough herbage renders it unfit for cattle in general; though horses, goats, and sheep will eat it; more, however, from its being one of the earliest spring plants than from any other cause.

2. *Luzula Forsteri.*

*Luzula* paniculâ cymosâ erectâ, floribus solitariis, capsulis acutis, seminis corunculâ subrectâ obtusâ.

*L. foliis pilosis, corymbo subsimplici, pedunculis unitfloris erectis, perigonii
1. *Luzula pilosa*

2. *L. Forsteri*

3. *L. Sylvatica*

4. *L. Campestris*

<table>
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<tr>
<th></th>
<th>a. Capsule</th>
<th>b. Transverse Section of do</th>
<th>c. Seed</th>
<th>d. Perisperm</th>
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*Forsten d.*

*SyZva&ca.*
perigonii lobis ovato-acuminatis, capsula mucronato-acuta. 


*Habitat* in nemorosis calcareis et glareosis.

*Peren.* May.

*Root* fibrous. *Stems* from 6—12 inches high, very slender, erect, simple, cylindrical, smooth, leafy. *Leaves* linear, narrower than in the preceding species, acute, hairy at the margin; upper ones largest. *Panicle* terminal, cymose, erect, spreading, a little branched; branches never divaricate or refracted. *Calyx-leaflets* lanceolate, acuminate, light-brown, as long as the capsule. *Capsule* one-celled, roundish-ovate, acute, mucronate. *Seeds* three, oval; coruncula straightish, obtuse, all meeting at the insertion of the pistil. *Vid. Tab.* IX. fig. 2.

No doubt whatever can be entertained with regard to the correctness of this being made a species. It was first discovered by Edward Forster, Esq. F. L. S., whose acuteness in indigenous botany has been rarely equalled, and published in the 18th vol. of *English Botany.* Its pointed capsule, peculiarly shaped coruncula, and ascending cyme, are invariable marks to distinguish it. The leaves are not half the width of those of *pilosa.* The *calyx-leaflets* are longer, much more acuminate, and of a lighter colour. The solitary flowers are peculiar to these two species. The figure given by Decandolle is very satisfactory, but somewhat stiff.


*Luzula* paniculâ cymosâ decompositâ, floribus fasciculatis, corunculâ obsoletâ.

*Vol. XII.* 2 x *L. maxima,*


J. maximus. With. 349.


G. hirsutum latifolium majus, juncea panicula. Moris. s. viii. t. 9. f. 2.

G. hirsutum latifolium minus. Ibid.

G. nemorum hirsutum latifolium minus juncea panicula. Park. 1185. 3.

G. hirsutum angustifolium majus alterum. Ibid. 5.


Habitat in sylvis, nemorosis et montosis.

Peren. May, June.

Root fibrous. Stems a foot or more high, erect, striated, leafy.

Leaves
Leaves linear-lanceolate, acuminate, eight-nerved, hairy at the margin; stem-leaves smaller, shorter. Panicle terminal, cymose, repeatedly compound, often divaricate. Flowers small, about three together, fasciculate. Bractes linear, hairy, acute. Calyx-leaflets equal, acuminate, somewhat longer than the capsule. Capsule ovate, mucronate, three-seeded. Seeds elliptical; coruncula sitting close to the seed, and of the same shape. Vid. Tab. IX. fig. 3.

Linnaeus comprehended this, with some other real species, in his *Juncus pilosus*; but that it is most distinct from every other, no botanist now doubts. It is the largest of the genus, whence the name *maximus*: but though this be the case, it has a smaller seed-vessel, in proportion, than any of the rest. It differs from *L. pilosa* and *Forsteri* in the circumstance of the flowers growing in clusters, and the repeatedly compound panicle; and from the *campestris*, in the absence of the spiked heads. It flowers later than the others by a month. The herbalists Bauhin, Parkinson, and Morison have two varieties of it, a larger and a smaller; but whether this has arisen merely from the different size of the plant, or whether there is really a distinction, as I confess I have sometimes suspected, I cannot at present determine. Parkinson's 1185. 5. is *Luzula albida*. His *Gramen nemorum hirsutum majus alterum precox tuberosa radice*, 1184. 2. is the large variety; 1185. 3. is the smaller one, copied from C. Bauhin. Morison's *Gramen hirsutum latifolium majus juncea panicula, sect. viii. t. 9. f. 2.* is the larger; and *Gramen hirsutum latifolium minus* the smaller, and copied also from C. Bauhin. Whether any old botanist besides Bauhin was acquainted with it, is doubtful. *Flor. Dan. 441.* represents the small variety.
4. **Luzula campestris.**

*Luzula* culmo tereti, spicis umbellatis sessilibus pedunculatisque ovatis, capsulis muticis.


L. *multiflora.*
Gramen hirsutum elatius, panicula juncea compacta. Raïi Syn. 416.
G. capitulis globosis. Ger. 16. 1. Ger. Em. 18. 3.
Habitat in pascuis siccioribus: β in humidis.
Peren. April, May.
Root fibrous, creeping. Stem four inches or more high, simple, erect, leafy. Leaves linear, plane, five-nerved, hairy at the margin; point rigid. Flowers in spikes, sessile, ten or twelve together; heads ovate, erect, at last nodding; the lowermost sessile, the rest pedunculated. Bractes three or four at the foot of each flower, membranous, fringed, shining, giving a silvery appearance to the flowers. Calyx-leaflets lanceolate, acuminate, shining, keeled. Filaments very short. Capsule obovate, obtuse, three-sided. Seeds reniform, roughish, ash-coloured green, opake; coruncula enlarged at the bottom of the seed, and attaching it to the receptacle. Vid. Tab. IX. fig. 4.
β. Taller, leaves longer, panicle composed either of many heads clustered into one, or several little ovate heads of flowers standing on long peduncles in somewhat of an umbellate form.

Though the real Luzula campestris is not likely to be mistaken, if its spiked flowers and obtuse capsule be attended to, yet it varies
ries so much, according to the soil in which it grows, as to render it difficult to assign the limits between it and \( \beta \), and some of the foreign species. Many botanists indeed have considered the bog variety as a distinct species. Ray, Dillenius, Sibthorp, Withering, and the French botanists are of this opinion. On the other hand, Linnaeus, Willdenow, Curtis, and Sir James Smith regard it only as a variety. To the latter opinion I assent after much examination. Sir James Smith, *Flor. Brit.* 386. in his \( \beta \) has only described that variety growing in bogs with a conglomerate head, composed, as Ray says, "ex pluribus veluti globulis coacervata;" but mine includes not only this, but another, equally common, the \( \gamma \) of Linnaeus, where the little heads stand on long footstalks, growing something like the one figured by Linnaeus, *Flor. Lap.* 1. c. 2., and yet totally distinct from it. Sir James Smith is at a loss to reconcile Ray's synonyms; but all the figures to which he refers are without doubt intended for the plant in its pedunculated state. Desvaux has made Linnaeus's \( \beta \) and mine a new species, which he calls *Luzula erecta*, as above quoted. I cannot, however, agree with this arrangement, being quite satisfied that Linnaeus's plant, *Flor. Lap.* 1. c., is a good species, and is to be known by the leaves being narrower and nearly destitute of hairs, the stems compressed, and spikes umbellated. Wahlenburg, who has given it a place in his valuable *Flora*, calls it *Juncus pallescens*, with this definition: "foliis planis, culmo compresso, spicis umbellatis oblongis pedunculatis patentibus, bractea foliacea." I have not observed it in any collection of British plants, though it is very likely to be a native of the northern mountains.

5. *Luzula spicata.*

*Luzula* spicata racemosa nutante, spiculis sessilibus bracteatis, capsulis acutis.

*Juncus*
on the Genus Juncus of Linnaeus.

Juncus spicatus, foliis planis subpilosis, spica glomerato-racemosa basi divisa nutante, petalis longitudine capsulae. Rost. Monograph. 46.


Habitat in alpibus Borealis.

Peren. July.

Root fibrous, tufted. Stem simple, six or eight inches high, slender, leafy. Leaves linear, channelled, hairy at the base; stem-leaves convolute or subulate. Spike terminal, nodding, cylindrical, oblong, obtuse; spikelets sessile, many-flowered, bracteated. Bractes pale, lanceolate, laciniated. Calyx-leaflets lanceolate, acuminate. Capsule pointed, one-celled, three-sided.

This plant approaches nearer to the Junci than any of the rest of the Luzulae here described. Its leaves are not so flat or hairy as most of the rest of the genus, and the capsule shows the rudiments of dissepiments. It is not likely to be confounded with any other plant, with the exception, perhaps, of L. pediformis, which is much larger, and has a pointed capsule. It is very rare with us, occurring chiefly in Scotland on the summits of the highest mountains. I found a single specimen in the herbarium of my friend Joseph Woods, Esq. F.I.S., gathered by him on Fairfield, near Ambleside; and this is the only instance that has come to my knowledge of its being found in England.

XVIII. De-
XVIII. Descriptions of two new Shells. By Captain Frederic Marryat, R.N. F.L.S.

Read February 18, 1817.

**MITRA.**

**MITRA ZONATA.**

Tab. X. Fig. 1, 2.

*Mitra* epidermide *lutea* fulvo-marmoratâ, anfractibus inferne basi nigris, columellâ quinque-PLICATâ.

*Habitat* in mare Mediterraneo.

Anfractus basi nigri, crenato-striolati.

This shell was taken up near the port of Nice in the Mediterranean, adhering to a sounding-lead, in very deep water. I have no hesitation in pronouncing it to be a new species, as I cannot find it described by any author.

**CYCLOSTREMA.**

**CHARACTER GENERICUS.**

Testa depressa, perspectivo-umbilicata; apertura circularis.

**CYCLOSTREMA CANCELLATA.**

Tab. X. Fig. 3, 4.

*C. testâ albâ*, lineis longitudinalibus et transversis elevatis decussantibus, inde cancellatâ.

*Habitat*
Habitat

Apertura labiis cancellatis, cancellis transversim striatis.

I found this beautiful little shell among a collection of chiefly West India shells. According to the Linnaean system, it would come under the genus *Turbo*; but with the advice of Dr. Leach, I have distinguished it as a genus, under the title of *Cyclostrema*. *Helix depressa* and *serpuloides* of Montagu are referable to the same genus.

Read March 4, 1817.

TEREBELLA.

Gen. Char. Body long and annulated, furnished on each side with pedunculated feet terminated with bristles, which are retractile: head with numerous long simple capillary appendages: three small ramified branchiae on each side behind the head.

The animals of this genus either prepare a sheath from the tenacious secretion of their bodies mixed with adventitious matter, or reside in prepared perforations at the bottom of the sea. The tubes which are prepared by them are in general so extremely delicate, that they are very easily destroyed, and they are then found lurking beneath stones, or forming a new habitation by connecting together sand or mud with the slimy secretion of their bodies. Some species form a tube in old shells or stones, to which they adhere by the whole length; others fix a tube perpendicularly in the sand, with two or three inches projecting above the surface. Many are gregarious, and so numerous, that we have seen the shore covered with the fragments of their tubes after
after a storm: thus, from the fragility of their tubes, these animals are often found at large. When in their tubes, generally but a small part is protruded, excepting the capillary tentacula, with which they seem to be searching for food in every direction by thrusting them into cavities of shells, under stones, &c.

The branchial appendages are usually coloured with orange or red whilst the animals are alive and in health, but lose their colour as they become weak or sickly, which probably arises from languid circulation.

The mouth is in front, and the under-lip usually projects so as to make the opening upwards.

All the species inhabit the sea.

Spec. 1. Terebella gigantea.

Tab. XI.

T. with seventeen pairs of exserted fasciculi and eight dorsal plates.

Body long, with numerous articulations furnished the whole length with peduncles, and a few with fasciculate bristles; but the seventeen anterior joints have the fasciculi most conspicuous, being always erected, and remaining so after death: the first eight joints have a broad plate on the back different in structure from the rest; they are of a rufous-brown colour, shaded with purplish-black, continuing down the back in a decreasing line. The general colour of the other parts is yellowish. Beyond the seventeen first joints the peduncles are very small, and appear to be destitute of fasciculi; and they incline gradually from the sides to the back, till towards the extremity they almost meet, forming two dorsal lines: near the mouth originate numerous capillary appendages, that are five or six inches
inches in length: the three pair of branchiae are much ramified, and red.

Length sixteen inches.

Inhabits the Devon coast, but is very rare.

*T. gigantea* is the largest of the discovered species; it inhabits the soil at the bottom of the sea, and seems to be destitute of any case. We found one specimen in the estuary of Kingsbridge at low water: it discharged an orange-coloured fluid from its mouth in great abundance.

**Spec. 2. Terebella cirrhata.**

**Tab. XII. Fig. 1.**

T. with eleven oval dorsal plates on the anterior articulations.

Body long, with numerous orange-coloured articulations, furnished with small peduncles, and at the anterior end with fasciculi of bristles: branchiae large and red: mouth with a frill-like membrane beneath, and ciliated above. Capillary appendages four or five inches in length.

Length nearly twelve inches.

Diameter near the head half an inch.

The tube (which is described in *Testacea Britannica* under the name *Sabella cirrhata*) is very fragile; it is composed of sand and clay, and is lodged in the ground, with half an inch projecting above the surface.

This species is gregarious, and is not uncommon on the southern coast of Devon.
Spec. 3. **Terebella Nebulosa.**

Tab. XII. Fig. 2.

T. with its body spotted with white, having thirteen dorsal plates. Body long, orange-red, spotted all over with white. Anterior extremity very tumid, defended by the dorsal plates: anterior peduncles very small, with the fasciculi pointed. The other peduncles and fasciculi are broad. The posterior end is abruptly smaller than the other, as if it had been lost by accident, and afterwards reproduced. The capillary tentacula are numerous, and of a pale orange-colour spotted with white. Branchiae red with white spots. Length six or seven inches. Diameter of the largest part half an inch. Inhabits the southern coast of Devon rarely, being taken only by deep dredging. Its case is composed of slimy matter, covered with gravel and broken shells.

Spec. 4. **Terebella Constrictor.**

Tab. XIII. Fig. 1.

T. with twelve broad plates on the back: capillary appendages pale. Body orange-red, with about one hundred and twenty approximate articulations furnished with small fasciculi; those behind the dorsal plates are divided down the middle by a sulcus: mouth with an expanded lower lip, surrounded with capillary appendages longer than the body. Length three or four inches. Inhabits the coast of Devon, and is rare. The very closely-connected articulations discriminate this species from any of the others. Its case or tube is unknown.
Spec. 5. **Terebella venustula.**

Tab. XIII. Fig. 2.

*T.* with orange-red body, thickly and minutely marked with white spots.

First seventeen or eighteen joints furnished with short peduncles and fasciculi: other joints with long peduncles and no visible bristles. Capillary appendages whitish, very slender, numerous, and nearly double the length of the body. We have observed this animal fixing its tentacula, and by contracting them drawing its body forwards.

Length rarely more than three or four inches.

Taken by dredging on the southern coast of Devon at Torcross.
XX. **Characters of two Species of Tordylium.** By Sir James Edward Smith, M.D. F.R.S. P.L.S.

*Read March 18, 1817.*

I have lately had occasion to remark, in preparing for the Linnaean Society a botanical essay on Tofieldia, that scarcely any considerable genus could be taken at random, which would not afford matter for such a dissertation. I had not proceeded far in the alphabetical course of my botanical labours for Dr. Rees's *Cyclopædia*, before an instance of this presented itself, in the long-established and well-known genus *Tordylium*, some of whose species have hitherto never been clearly determined. Our popular guides, such as Willdenow, have left the subject in the same state in which they found it. The details into which I find myself obliged to enter, are beyond the scope of the work above mentioned, and may not prove unworthy of the notice of the learned body whose attention I shall now, for a few minutes, solicit.

The species of *Tordylium* which will come under our examination at present, are chiefly *officinale* and *apulum*, with the *humile* of Desfontaines; except some incidental notice of the Linnaean *peregrinum*, and of Scopoli's *siifolium*.

*T. apulum* is mentioned by Linnaeus in his *Hortus Cliffortianus* 90. n. 3, under the following character and synonyms.

T. *umbellulis remotis*, *foliis pinnatis*, *pinnis subrotundis laciniatis*.


T. *apulum*


A variety is subjoined from Boerhaave’s *Hort.* *Lugd. Bat.* concerning which nothing can be ascertained; and as Linnaeus never again adverted to this supposed variety, we must leave it undetermined.

In the first edition of *Sp. Pl.* 239, the *Tordylium* in question appears with the specific name *apulum,* and the above essential characters, with a reference to *Hort.* *Cliff.* and to Van Royen’s *Prodr.* *Lugd. Bat.* 94. But its other synonyms are limited to Columna and Bauhin, as above cited.

Now it appears that the synonyms of Columna and Rivinus belong to two very different plants. Which of these is to be taken for the *T. apulum* of Linnaeus? There being no specimen in his herbarium, the specific character must be resorted to as our safest guide, and this agrees with the plant of Rivinus, not of Columna; “pinnis subrotundis laciniatis.” Such was doubtless the plant of the *Hortus Cliffortianus,* which appears by the *Viridarium Cliffortianum* to have been cultivated at Hartecamp, and was therefore seen alive by Linnaeus. Such likewise is *T. apulum* of Jacquin, *Hort.* *Vindob.* v. 1. t. 53, which that author afterwards finding not to answer to the synonym of Columna, he thought he had mistaken the Linnaean name, and in the 3d volume of the same work, p. 2, he refers his plant to the Linnaean *T. officinale.*

On the contrary, it appears to me that Columna’s figure represents merely a starved variety of *officinale,* under which species I have long ago quoted it, with a mark of doubt, in *Fl. Brit.*; and that Jacquin has described the genuine *apulum* of Rivinus and Linnaeus.
These species are clearly distinguishable by a character which, though faithfully indicated by Rivinus and Jacquin, has not been fixed upon by any botanist as a specific mark. In *T. officinale* the radiant or dilated part of the marginal flowers consists of two neighbouring petals, each of which has one large, and one very small, lobe; in *T. apulum* there is only one radiant petal to each flower, whose two very large lobes are equal. I would therefore propose the following definitions of the two species in question:

*T. officinale*, involucelli longitudine florum, foliolis ovatis incisis crenatis, petalis radiantibus geminis inæqualiter bilobis.

*T. apulum*, involucelli flore brevioribus, foliolis laciniatis; superrioribus angustatis, petalis radiantibus solitariis æqualiter bilobis.

The synonyms of the former are correctly given in both editions of *Sp. Pl.* as well as in *Fl. Brit.* 294; to which are to be added *Engl. Bot.* t. 2440, and the unpublished figure in *Fl. Graec.* t. 267. There is every reason to suppose this the original Τούρδυλιον of Dioscorides. If Columna had been as exact as usual, his figure would have left us in no doubt respecting the character of the petals. But as it is, enough may be discerned for our purpose; and the form of the leaves, the length of the partial involucrum, and the figure of the seed, all agree with *T. officinale*, not with *apulum*.

To the latter belong the synonyms of *Rivin. Pentap. Irr.* t. 2, and *Jacq. Hort. Vind.* v. 1. 21. t. 53; which last is quoted in MSS. by Linnaeus in his own copy of *Sp. Pl.* This is likewise *T. apulum* of *Prodr. Fl. Graec.* n. 631, from which however must be removed the reference to Columna, and consequently the synonym of Tournefort depending thereon; *Jacq. Hort.* v. 1. t. 53, being introduced in their stead. Bauhin’s *Seseli creticum minimum* also, being adopted from Columna, belongs to *T. officinale*.
I cannot but consider *T. humile* of Desfontaines, *Fl. Atlant. v. 1.* 325. *t. 58,* as indubitably *T. apulum.* It accords exactly in size and habit with Dr. Sibthorp's Greek specimens. Willdenow, by some accident, has not adverted to this plant.

Scopoli's *T. siisfolium,* *Fl. Carn. ed. 2.* *v. 1.* 194. *t. 8,* comes very near to our *apulum,* agreeing in the solitary radiant *petal,* with two equal lobes. But the *flowers* are red, not white; the *leaflets* broader, less divided, and more uniform; and the *fruit* bristly, which last may afford a good specific character. The *general involucrum* moreover is said to consist of only one or two small leaves.

I cannot conclude these remarks without adverting to *T. peregrinum,* *Linn. Mant. 55.* *Sm. Prodr. Fl. Grac. Sibth. n.* 633. This is *Conium dichotomum* of Desfontaines, *Fl. Atlant. v. 1.* 246. *t. 66,* who seems not aware of its being a Linnæan plant. Its *seeds* indeed bear some resemblance to those of a *Conium;* and the *flowers,* which the able author just cited never saw, are uniform, scarcely radiant. The habit and foliage agree with *Conium* rather than with *Tordylium.* But, on the other hand, the character of the *involucella dimidiata* is not observable, and the crisped margin of the *seeds* answers better to *Tordylium,* though their strongly 3-ribbed disk is adverse, and rather belongs to *Conium.*

To the latter genus I should perhaps consent to remove this species. Professor Sprengel, in his *Prodr. Plant. Umbellif.* 12 & 21, refers it to *Cachrys;* but I cannot discover any peculiar coat to the seed, which, according to that learned writer's own principles, might justify such a measure. It is remarkable that he distinguishes the plant of Linnæus from that of Desfontaines, though certainly without any foundation.

Norwich, Feb. 10, 1817.

J. E. Smith.
XXI. Observations on a Viper found in Cranborne Chace, Dorsetshire. By the Rev. Thomas Rackett, F.R.S. & L.S.

Read April 15, 1817.

The Viper which accompanies this paper does not appear to have been noticed by any British naturalist. It is probably Coluber Chersea of Linnaeus.

p. 12.

"Habitat in Sueciae præsertim Smolandiae, Scaniae, Uplandiae, "coryletis et fruticosis depressis, etiam in Pomeraniae dumetis.
"Bero satis affinis, et citius funesta nisi pars morsa statim rese-
"cetur. 9½ poll. longus.
"Bero minor, color obscurius spadiceus, caput ovatum, truncus teres."

Linnaeus has described this species in the Swedish Transactions for the year 1749, and has given a figure which nearly resembles our specimen. The heart-shaped spot on the head is apparent. The belly is quite plain, and has not the appearance of steel observable in the common viper. Linnaeus lays great stress on a dark spot near the extremity of the tail, as a distinguishing character of the species: this mark is very evident in the one under examination.
I received the viper from the Rev. John Tregonwell Napier, Rector of Chettle in Dorsetshire, who killed it in Cranborne Chace. It is extremely rare, but known to the gamekeepers under the name of "The Red Viper." A mutilated specimen sent to me last year, was when recent of a bright red colour inclining to orange. The bite is much more venomous than that of the common viper; as I have been assured that a dog which had been bitten by a red viper, expired before he had reached the extremity of a down in his way home.
XXII. Description of select Indian Plants. By Henry Thomas Colebrooke, Esq. F.R.S. & L.S.

Read April 15, 1817.

Having had the opportunity, during a long residence in India, of examining some plants, which had not, so far as I know, been previously described, and others which had been but incompletely so, I purpose to submit to the notice of the Linnean Society, in this and successive communications, such of them as appear deserving of remark, either as constituting new kinds, or notable species of previously settled genera.

Under the first head is a plant of which the delineation is here presented under the Indian name; as this seems not unsonorous, nor otherwise objectionable. In general it is desirable to avoid the coinage of new words, and to preserve existing names, whenever they are not too barbarous for admission into the classical nomenclature of botanical science. I propose therefore to retain the Indian term, scarcely altered, for a denomination of the genus; and accordingly to name it Sabia from the Hindi Sabja.

Under the second head, one of the most remarkable of the plants which will be here offered to the Society's consideration is a species of Strychnos, which bears much resemblance to that described and figured by M. Leschenault*, and by him affirmed to be one of two which afford poison used to envenom weapons in Java,

Java, and the most deadly of the two which have been there employed for that nefarious purpose. Neither M. Leschenault nor Dr. Horsfield, who has also noticed it*, saw the fructification. But the first of those naturalists has concluded (I presume from the habit) that it is a *Strychnos*. The plant which I take to be nearly allied to it, if not specifically the same, and of which I have examined the fruit, is an undoubted *Strychnos*. It grows in the mountains and forests north and east of Silhet in Bengal; where, from numerous other instances, the flora is known to partake largely of that which belongs to the Malayan peninsula and archipelago. The mountains confining the province of Silhet seem to be the boundary, in the geography of plants, between the hither and remoter India, between the cis-gangetic and trans-gangetic regions.

The specimen of this *Strychnos* was sent to me by Mr. M. R. Smith, who, without being himself conversant with botany, has laboured assiduously in advancing the science by collecting specimens of indigenous plants from countries contiguous to that sequestered province, and by communicating his acquisitions to the botanical garden at Calcutta.

The flowers of this plant have not been seen by me. But the examination of the fruit authorized the pronouncing of it to be a *Strychnos*; which has been verified by Dr. Wallich, the present superintendent of the botanical establishment at Calcutta. It differs from Leschenault's description and drawing, as the leaves are ovate, acuminate; his elliptic, acute. Dr. Horsfield designates the leaves of the Javanese species as in pairs, or pinnate in two or three pairs; egged, spear-shaped, terminating in a long narrow point. Nevertheless, the prominent character of the incrassated tendrils, noticed by Leschenault, raises a surmise that

*Bat. Trans. 7.*
of select Indian Plants.

The Har-cuchila of Silhet may be the same with the Tieutè or Chitik of Java.

The Bengalese name, which is that of the Nux vomica (cuchila), with a distinctive epithet (hár), shows that the natives of Silhet have remarked the affinity of these Indian species of Strychnos. The specimen was received thence with the information that "the plant has medicinal virtues;" but without any intimation of deleterious qualities in the bark or root. The leaves are used externally as suppurative; and the seed internally as a febrifuge. In a large dose, however, it is said to be poisonous.

In this, as in most, if not in all, the species of the genus, the wood, and still more the bark, are intensely bitter. This is eminently the case in the two species first known and described, S. colubrina and Nux vomica. They are employed in the Indian practice of medicine, especially the bark of the root; which is administered by native practitioners as a febrifuge. Their seeds are used singly, and in conjunction with opium as an adulteration of that drug, for their narcotic efficacy; and are also employed by venders of ardent spirits to augment the intoxicating power of the liquor vended by them.

In the Javanese species, a decoction of the bark of the root has been ascertained by Dr. Horsfield to be a most active poison when internally administered. The soluble matter of the bark appears also to be the efficient part of it as a mortal venom introduced by a wound.

Notwithstanding the seeming contrast of qualities between a medicine and a poison, it is possible that the same substance, which is deadly in a greater quantity, may be salutary in smaller doses: the presumption, therefore, is not conclusive against the identity of the species indigenous in Java and in Silhet.

Another plant now submitted is a species of a genus named
by Gærtner \textit{Pygeum}. Nothing more of his plant was seen by him besides the fruit; and as no marked difference sufficient to discriminate the species is presented in the mature fructification, it is possible that the species now described may be the same which he named \textit{Pygeum zeylanicum}. It seems prudent, however, to give provisionally a distinct trivial name to a plant, which most probably is specifically different.

Two plants of the natural order of the \textit{Asclepiadaceae} have been selected for insertion in the present communication: the first of them, a species of \textit{Dischidia}; only one species of that genus having been hitherto described. It was figured by Rumphius, being native of the Molucca islands. The present sort is indigenous in the north-east of Bengal: and the ingenious botanist, by whom the genus was constituted, has intimated, that India possesses other species of it not yet examined in a perfect state*. Another plant now described is a \textit{Tylophora}; in which genus the specific characters of eight sorts have been established by its author: but none I believe have been delineated by figure.

One more plant of a known genus is here described; and, in deference to authorities of the Linnean school, under the generic name of \textit{Macrolobium}. I should be disposed, however, to follow Lamarck in separating very dissimilar plants, which Schreber has collected into one group. If this be allowed, and Lamarck’s generic name be retained, the plant now described may be designated \textit{Vuëpa bijuga}.

* Brown’s \textit{Prodromus}.
SABIA.

Pentandria monogyinia: pentapetalous, inferior.

SABIA lanceolata.

Tab. XIV.

Native of Silhet, where it flowers in October, and bears ripe seed in May.

Beng. (at Silhet) Sabjá-lat.

Stem shrubby, scandent, flexuose. Leaves alternate, short-petioled, lanceolate, acute, entire, smooth; 4—6 inches long; 1—1½ broad. Corymb axillary and terminal; forming a loose, ovate panicle: primary divisions ternate. Flowers numerous, small; green with a slightly-purplish tinge. Bractes minute, ovate, acute. Perianth five-parted, acute, persistent. Segments ovate. Petals five, lanceolate, acute, spreading, smooth, persistent. Filaments five, flat, subulate, shorter than the petals, inserted at their base. Anthers round. Germ round. Style columnar, short. Stigma simple. Drupe reniform, pulpy, dark-blue, size of a kidney-bean, one-seeded, sitting on the permanent calyx and corolla. Nut or Pyrene solitary, unequally two-lobed, attached by the middle of the smaller lobe a little above the base. Shell crustaceous, thin, fragile. Seed solitary, attached to the navel by a clavate ligament; honey-coloured; spiral, anfractuous (a single chink on one side, and two on the other, answering to plicatures of the cotyledons). Integument single, chartaceous. Embryo erect, conform to the seed, white. Cotyledons almond-fleshy, writhed (being folded one within the other; plaited once longitudinally and thrice transversely). Scape dorsal, curved, filiform. Radicle conical, inferior.
REFERENCES.

A. B. C. Flower magnified.
D. E. F. Fruit (natural size).
G. Seed in a state of germination (natural size).
H. The same denuded; or embryo.

STRYCHNOS AXILLARIS.

Leaves ovate, acuminate. Tendrils axillary, thickened. Berry oval, one-seeded.

Native of mountainous countries north and east of Silhet in Bengal; where it blossoms in the hot season, and ripens its fruit in the beginning of the rainy season.

Beng. (at Silhet) Ar-cuchila, or Hár-cuchila.

Strychnos axillaris.
TYLOPHORA EXILIS.

Description


Introduced into the botanical garden at Calcutta in 1810 from Chitagong, of which it is native. Bears flowers and ripe seed in the middle of the rainy season (August).

Stem perennial, simple, scandent, twining with the sun, several yards in length, no thicker than a crow-quill; rooting at the joints if it trail on the ground: young parts thinly beset with soft hairs. Leaves opposite, petioled, ovate to cordate, acute or even acuminate, entire, smooth on both surfaces, few-veined: old leaves firm, fleshy. Length 1–2 inches. Breadth half as much. Petioles ¼ inch; round, somewhat channelled on the upper edge. Flowers small, dilute purple, inodorous. Panicles subaxillary, solitary, ramous, lax, dichotomous, or flexuose with alternate divergent pedicels; terminating in umbellets; many-flowered. Peduncles slender, round. Pedicels proper, somewhat clavate. Bractes triangular to ensiform, minute. Perianth five-parted. Segments triangular. Corol rotate. Divisions oval, obtuse. Nectary, or stameneous tube, round at the base, five-angled in the middle. Germs ovate. Styles most short. Stigma flat, pentagonal. Follicles oblong, tapering to a pointed apex, round on one side, flat on the other. Seed ovate, bracteate, convex without, concave within, papillous, margined, denticulate at the base, cinnamon-colour, crowned with a fascicle of many long silky hairs.

The panicle of this, compared with proliferous umbels of some other asclepideous plants, seems to indicate a derivation from such
of select Indian Plants.

which the pulp strongly adheres. Interior thin, brownish. Perisperm conformed to the seed, undivided, white, semitransparent, horny. Germ almost half the length of the perisperm, milk-white. Cotyledons cordate, three-nerved. Radicle inferior, cylindric, longer than the cotyledons.

Compare with Strychnos Tienté, Leschenault, Ann. du Mus. 16. 479. pl. 23. and Tshittik, Horsfield, Bat. Trans. 7.

DISCHIDIA BENGALENSIS.

Leaves oblong, apiculate.

Native of Silhet, where it is named, like other parasites, Paráràhá; and thence introduced into the botanical garden at Calcutta by Mr. M. R. Smith. Flowering season, April.


The mature fruit has not been seen. But the flower sufficiently marks the genus.
of select Indian Plants.

such an umbel by elongation of the ramifications; which, scattering the rays of what should form an umbellet, converts the inflorescence into a panicle.

MACROLOBIUM BIJUGUM.

Tab. XVII.

Flowers triandrous. Six sterile filaments. Leaves two-paired.

Whence or how introduced into the botanical garden at Calcutta, where a solitary plant has long been, is uncertain. It flowered there for the first, and, so far as is known, the only time, in 1813, in the hot season; the tree being about eight feet high; and ripened a single legume in September.

length and situation of the stamina, filiform. Stigma headed, two-lobed. Legume broad-falcate, compressed, few-seeded. Seed black, immersed in lateritious meal: unequally reniform or nearly three-cornered, compressed.

This is seemingly a plant of the same genus with the Vouapa and Simira of Guiana described by Aublet; from the first of which a genus was constituted by Lamarck (Illust. Genres, i. 96). Schreber, followed by Willdenow, has united them with the Outea of the same author, in a genus of which the character is taken from the plant last mentioned*. In deference to their authority, the Indian plant is here described under the name assigned by them to the genus; entertaining nevertheless an opinion, that, with the Vouapas, it should be separated from that, and formed into a distinct genus with the essential character nearly as given by Lamarck: "Calyx four-leaved or four-parted. A single unguiculate petal. Three fertile stamens opposite to the petal. Legume compressed, few-seeded." The affinity of the Indian plant now described to the Bauhinia, Poinciana, &c. places it in the natural order of Cassias; from which it should not perhaps be disjoined even in the artificial system; as Bauhinias with sterile filaments seem to indicate, that its proper place is in the Decandra class.

PYGEUM.

Gärtner de Fruct. 1. p. 218. t. 46. f. 4.


PYGEUM ACUMINATUM.

TAB. XVIII.

A large tree, native of mountainous countries bordering on


Silhet.
Pygeum acuminatum.
Silhet. Flowers in the rainy season, and ripens its seed in the cold season, about January.

Beng. (at Silhet) Ghorma.


Gærtner, who constituted the genus, saw neither flower nor any other part of the plant besides the fruit: consequently, until his Ceylonese plant has been further examined, it must remain doubtful, as I apprehend, whether the species be distinct: and, at all events, the specific character cannot be yet determined, as but one species is fully described.

Read May 6, 1817.

Before I enter upon the immediate subject of the following communication, it will be necessary that I define precisely the meaning which I annex to the word species; as that appears to me to be often used somewhat vaguely and licentiously by writers upon botanical subjects. By a species of plants, I mean all plants which can be made to breed together without producing mules; that is, without producing plants which are incapable of affording offspring by seeds: and I consider all plants to be of distinct and different species which cannot be made to breed with each other (if capable of breeding at all), or which, if they intermix, produce mule plants. The peach and nectarine tree have, under my care, bred very freely with the bitter-almond tree; and the offspring do not appear to be mule plants: and I am therefore disposed to question the specific difference of the Amygdalus communis and A. persica. Similar experiments have led me to doubt the specific difference of the cultivated plum and sloe; and I possess several varieties of the willow, which are not mules, and which appear to have derived their existence from seeds of the Salix Russelliana, and the pollen of the S. alba; and therefore I am much disposed to question the claims of many of the intermediate supposed species to their present titles.

Many plants of the following species and varieties of strawberries
berries were planted in pots, in different successive seasons, for the purpose of experiment:—the common wood, the white alpine, the Duke of Kent’s, or wood-strawberry of Canada, the common scarlet, the Bath scarlet, the pine, the black, the white Chili, and the hautbois, with some others which proved to be varieties of the common scarlet, but to which no particular name had been given. The pollen of the Wood-strawberry was introduced into blossoms of the White alpine, from which the stamina had some days previously been extracted in an immature state. Abundant seeds were produced, which afforded offspring generally similar to their male parent in taste, flavour, and colour. The wood-strawberry of Canada, the common scarlet, the Bath scarlet, the pine, the black, and the white Chili afforded under similar circumstances abundant offspring, however crossed, and the offspring presented every intermediate shade of character between these varieties; but none of them would intermix with the wood or white alpine. The Hautbois did not breed with any of the preceding varieties, except in one instance with the Bath scarlet, from the seeds of which I obtained plants which proved apparently to be mules. I preserved these several years, in which they made feeble and always abortive efforts to produce blossoms. In external character all of these a good deal resembled the hautbois in foliage and general habit; and two of them were not readily distinguishable from plants of that species.

The preceding results, therefore, lead me to conclude that our gardens contain three, and three only, distinct species of strawberry, one of which has sported very widely in varieties.

I much wish that some members of this learned Society would make experiments, similar to those above stated, upon the different species and varieties of plants now comprehended within the genus Rosa, Salix, Pelargonium, and others. Many of the sup-
posed species of each of the preceding genera would, I am very confident, be found capable of breeding with, and being transmuted into, each other, as to their external characters; and if botanical writers still choose to call such species, they ought certainly to distinguish them from others, as secondary or transmutable species. The external form and character of each plant, as it came from the hand of nature, was probably sufficiently peculiar to render it readily distinguishable from those of every other species: but varieties of soil, of climate, and of culture applied for other purposes, have so far mixed and confounded the primary characteristics of many species, that experiments, such as those above described, now afford probably the only source of decisive evidence.
XXIV. On the Germination of Lycopodium denticulatum, in a Letter to the Secretary from Richard Anthony Salisbury, Esq. F.R.S. and L.S.

Read June 3, 1817.

DEAR SIR,

Professor Brotero's description of the Lycopodium denticulatum agrees so exactly with the plant of which I send you some figures, Tab. XIX., that I have nothing to add to it, except that I have never found the capsule three-lobed, as he says it is, but invariably four-lobed: in some positions, however, it appears three-lobed, and he himself mentions that it always contains four seeds.

Notwithstanding I have examined many flowering branches, I have not been able to detect the manner in which the seeds are fecundated, or to find anything like an Embryo in them, though they come up in abundance spontaneously under the parent plant, and on the adjacent moist parts of the shelf, where it stands in Mr. Joseph Knight's greenhouse.

The seeds contain at an early period of their formation a clear liquor, which quickly evaporates, and flashes when applied to a candle: this liquor soon becomes milky, and is finally converted into what appears to me grumous albumen.—I am not certain how the seeds are inserted, and believe that I have not yet been so lucky as to meet with a single fecundated seed, though perfect in all other respects; for this occurs in Cycas, when there is no male plant to fecundate its seeds. In one capsule, in which the seeds
seeds had ceased to swell, apparently from their earliest formation, they adhered together to something like a central placentas: in all the other capsules I found them loose, and suspect the placenta had been absorbed by the liquid remaining in the capsule. A very minute hilum remained always visible, and the three-radiated mark originating there appears to me to be only three stronger ribs of the reticulated cuticle of the seed.

The germination of this plant approaches much nearer to that of *Dicotyledones* than to that of *Monocotyledones*, especially if that part which Brotero calls *vitellus* be considered a radicle. I am, however, inclined to think that it is true albumen, though it does adhere to the embryo; and till we can succeed in getting plenty of perfect seeds, or to catch them in a still earlier stage of germination than the first figure I now send you represents, this point will remain dubious.

In the mean while, a comparison of the seeds of this *Lycopodium* with those of *Isoetes* and *Pilularia*, which they exactly resemble, will assist us; and as Brotero says that he has seen the part he describes for stigma "liquore unctuoso diutissime perfusum," I have little hesitation in believing that it is so: before I read his account, I took the suture at the top, where the capsule afterwards splits, for the stigma, and it is not very unlike the stigma of *Stylidium*.

I remain, &c.

18, Queen-Street, Edgeware-Road,
June 3, 1817.

R. A. SALISBURY.
Lycopodium denticulatum.
REFERENCES TO THE FIGURES.

TAB. XIX. Fig. 1. A seed in the earliest stage of germination yet observed.
2. The same more advanced.
3. Its seed-coat removed to show the vitellus of Brotero adhering.
4, 5. Still more advanced.
6. An anther.
7. The same splitting and discharging its yellow pollen: I find no difference between this pollen and that of other Lycopodiums, which has been regarded as seed.
8, 9. Upper and under surfaces of a capsule, the latter showing its pedicellus.

a a a a. The part described for stigma by Brotero: it is thinner and more transparent than the rest of the capsule.
10. A capsule burst naturally, with its four seeds.
11, 12. Two views of a seed more magnified, the latter showing its hilum and three-radiated mark.
13. A transverse section, filled with white grumous albumen?
14. One of the reticulated areas of the cuticle, highly magnified, in the centre of which, while young, there is a succulent bristle green at the point.

XXV. Some
XXV. Some Account of the Lycoperdon solidum of the Flora Virginica, the Lycoperdon cervinum of Walter. By James Macbride, M.D. of South Carolina. Communicated by the President.

Read June 3, 1817.

This fungus is most frequently dug up in lands which have not been cleared of their original wood more than three or four years, in the preparation for planting. It is found at various depths, from a few inches to two feet, and is sometimes met with partly above ground. I have seen it in every variety of soil, except swampy; but it is found in greatest abundance, and appears to attain to the greatest size, in loose rich lands, the forest-trees of which were different species of oak, Juglans alba, Linn., and Pinus Taeđa. It is very common in the southern states; but is rarely seen further north than Maryland. Its shape is irregular; the largest specimens approach the globular form, or the cylindrical with globular ends. I have seen a specimen which weighed fifteen pounds; and I am credibly informed a single tuber has weighed thirty or forty pounds.

The common opinion entertained of this substance is, that it is the root of the Erythrina herbacea or Convolvulus panduratus, both of which have large roots, and that of the latter penetrating the earth to a considerable depth. The usual appellation of it is Indian Potatoe or Indian Bread. It was used by the Indians as an article of food, as their name for it (Tuckahoe) is said to imply.
Fugitive negroes sometimes subsist upon it. Deer, the wood-rat (a Sorex?), and probably squirrels, feed upon it when it grows sufficiently near the surface of the earth. From the abundance in which it grows, and its nutritious quality, it must have been to the aborigines a considerable source of subsistence, had they known any method of detecting it. The discovery of it now is always accidental.

This fungus is parasitic at first, growing out of the living roots of various trees. It appears at first, in most instances, between the wood of the root and liber; but in some of the smallest specimens accompanying this paper it can be seen only between the lamellae of the outer bark. It may, like other fungi, emanate from dead wood, but the smallest specimens which I have seen were attached to living roots. During its growth it detaches the bark from the roots, incorporating it with its coat, surrounds the ligneous portion, and gradually assimilates it with its own peculiar internal substance. If during the expansion of the fungus it comes in contact with the root of another tree, it is also assimilated with it. In large specimens no traces of the bark or wood of the original root are discernible. Nothing is known respecting the progress or duration of the growth of the *Tuckahoe*; it has been dug up in lands cleared of wood more than a century.

The outer coat of this fungus is of a dark-brown colour, and roughened by irregular fissures; the inner, if I may be allowed to make this distinction, is coriaceous, resembling that portion of some of the *Boleti* which is used as touchwood; and when a part of the fungus grows exposed, the inner coat of that portion is thickened, and when properly dried is very combustible. The internal substance is insipid, inodorous, of an uniform white, compact, and not disposed in any regular manner; but in fresh specimens,
specimens, divided transversely, it uniformly cracks in lines perpendicular to the surface. In a solitary specimen, which was very large, I observed something like a disposition of the internal substance in concentric laminae; but I have macerated many specimens in water, and corroded them by acids, without discovering that such a structure really obtains.

The Tuckahoe newly dug up contains little moisture, and soon becomes very hard if kept in a dry place; but in a situation unfavourable to evaporation, a fine white byssus issues from it and envelops it. I have seldom, if ever, seen it undergo any change resembling putrefaction. When exposed a long time to the weather, it crumbles, assumes a ferruginous colour, and becomes acidulous to the taste. The internal substance moistened with water feels slippery. When dried particles of it are pressed between the teeth, they have a cohesive effect; when moistened with water and spread over a hot surface, they form a tough elastic pellicle, which, if exposed to a greater degree of heat, blackens, froths, and emits a smell resembling that of burning bread. When an infusion of galls is added to water in which the tuber has been macerated, a copious white precipitate is thrown down. Sulphuric acid dissolves it, and acquires a purple colour, which in a few days deepens into a black. Water added to this solution causes a dark, flaky precipitate.

From such experiments as I have made with this fungus, I am led to believe its internal part is chiefly composed of gluten, but differently modified from that which we obtain from the Cerealia. I have not succeeded in procuring from it any starch or fibrous matter.

In some specimens I have observed portions of the internal substance loose and friable. These were always saccharine and acidulous to the taste.

I am
I am sorry that I am unable to give any information as to the following particulars:

1. How long the fungus continues to derive support from the juices of the roots out of which it grows, and whether it causes the death of the inferior portion of the root.

2. Whether the Indians knew any method of finding it similar to what is practised by the truffle-hunters in Europe. Tradition says they did.

3. The probable quantity of the fungus produced by a given portion of ground.

Charleston, March 28, 1817.
XXVI. An Account of Rhizomorpha medullaris, a new British Fungus. By Sir James Edward Smith, M.D. F.R.S. P.L.S.

Read June 17, 1817.

This, which appears to be a nondescript species of Rhizomorpha, was communicated to me by Mr. Francis Boott, an American botanist, who met with it during his visit to Derby, in the course of last spring. It was first observed, many months before, by Mr. Bainbrigge, house-surgeon to the Derby Infirmary, and seems to have excited attention as a troublesome intruder into the reservoir destined to supply the baths. That gentleman thus describes the appearance and situation of the fungus in question.

"The reservoir in which it was found is a kind of circular cellar, with an opening at the top. It is situated in the shrubbery, and contains water to supply the baths, which is conveyed by leaden pipes. As the water is sent by a forcing-pump, a piece of timber was fixed across the upper part, to support a perpendicular pipe that admitted the water. From this timber, which was deal, and not in the least decayed, the plant hung, and as the depth of the water varied, a greater or less quantity floated on the surface. I believe the whole of it would be seldom immersed; but the wood, and every part of the plant, would be always wet, in consequence of the water going in with considerable force. I saw the joiner measure the fungus immediately on our getting it out, and he says the length was 12 feet. This I have quite forgotten, but
but am inclined to think him mistaken. The plant had a beautiful appearance in the water, from the fibres diverging in every direction, and its whiteness, which was lost when it became dry. The extremities were peculiarly brittle. Even the agitation of the water broke off large quantities. This produced great inconvenience, and several attempts were made to destroy the plant, by clearing it away; which not succeeding, the timber was, at length, removed. Oak has been substituted, smeared with tar, pitch and tallow, which has hitherto had the desired effect. The old beam has been used for other purposes.”—Such is Mr. Bainbrigge’s very accurate account. Mrs. Hardcastle of Derby, to whom I am indebted for the drawings now laid before the Linnaean Society, regrets that she only heard of this curious vegetable production by accident, after it had lain by ten months in a dry state. Her drawing therefore represents this state only, and is here accompanied by a very small portion of the original specimen. This, in its brown and shrivelled appearance, much resembles the roots of willows or poplars, such as often find their way under ground into some adjacent river, or water-course. These have often been brought for my inspection, and I must confess they have led me to doubt the existence of some reputed Rhizomorphae; but I shall in future be more precise in my examinations, lest I should inadvertently confound with them any genuine fungus. That the present is really of the latter description, appears from its history, as well as from the texture of the dried plant, whose internal substance does not, like a root, consist of concentric circles, but of an uniform congeries of longitudinal parallel tubes, in the dried specimen at least, of a yellowish colour. There is nothing like a central pith. And yet the brown external coat, though not separable like the bark of a root, bears so great a resemblance to that part, as almost to stagger my opinion.
opinion. The taste of the dried plant has nothing of a fungus-like flavour, but in its slight astringency agrees with many, almost tasteless, roots. The above history of the origin of the plant, from a piece of wrought wood, and its copious growth, must preclude all idea of its being anything else than a parasitical fungus.

The specific character may thus be given:

**Rhizomorpha, medullaris, teres ramosissima nivea; intus cellulosa flavescens.**

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**REFERENCE TO PLATE XX.**

**Fig. 1.** A portion of the stem of *Rhizomorpha medullaris.*

**2.** Termination of a principal branch.

**3.** A transverse section of the stem magnified.

London,
June 12, 1817.

J. E. Smith.
XXVII. A Century of Insects, including several new Genera described from his Cabinet. By the Rev. William Kirby, M.A. F.R. and L.S. 

Read November 4, 1817.

The infinite host of non-descript insects occurring in the entomological cabinets of this country, is rather disgraceful to us: and what is more so, we permit foreigners to do that for us which we are fully competent to do ourselves. Witness the numbers described by Fabricius, Olivier, and others from British collections.

Pudet haec opprobria nobis
Et dici potuisse et non potuisse refelli.

I am not, however, so illiberal as to wish that the entomologists of the continent should be excluded from our cabinets: if we ourselves are too idle, or too busy, to give the public some account of our entomological treasures, it is for the interest of science that they should do it for us.

To remove, in some degree, this opprobrium, I beg leave to offer to the Linnean Society descriptions of a century of the non-descript insects of my own cabinet. Should this attempt meet with approbation, I may be induced, perhaps, to describe the remainder; and I wish that my example may stimulate other gentlemen to do the same with respect to their own collections.

In my general arrangement I have followed that of my kind and
and learned friend M. Latreille, in adhering to which I have found that my cabinet contained many insects that could not well be placed in any of his present genera. These I have named and characterized.

**COLEOPTERA PENTAMERA.**

(Cicindelidae.)

*Megacephala* Latreille.


**Long. corp. lin. 8½—9.**

*Habitat* in Brasilia. D. Hancock.


The comparative length of the maxillary and labial palpi, upon which this genus is built, seems to me, in this case especially, to indicate a family rather than a genus. The labrum, however, is of a different shape from that of most other *Cicindelidae.*

**Cicindela** Linn.

*nivea.* 2. *C. ænea* niveo-pilosa, labro elytrisque glabris albis.

**Long. corp. lin. 7.**

*Habitat* in Brasilia. D. Hancock.

pressorum nigrorum. Postpectus * et abdomen medio glabra purpurascensia.

(Carabidae.)

**Scarpites Fabr.**

*excavatus.* S. S. ater, elytris elevato-striatis: interstiiis serie punctorum excavatorum.

Long. corp. lin. 17½.

*Habitat* in Brasilia. D. Hancock.


**Pelecium Kirby.**


* By this term Mr. Spence and myself have distinguished that part of the body in which the four posterior legs are inserted.
† By this term we designate that part of the elytron that is under the lateral margin, which often covers the sides of the body, and is remarkable in many Heteromerous insects.
Mr. Kirby's Century of Insects.

This genus is distinguished from all others of the tribe by the form of its labrum, and of the last joint of the palpi. It should be placed at the end of Latreille's fifth section, between Pana-gæus and Cychrus.

cyanipes. 4. P.

Plate XXI. Fig. 1.

Long. corp. lin. 7½.

Habitat in Brasilia. D. Hancock.


* Cuvier, Règne Animal, iii. 197.

**Calosoma.**

*chinense.* 5. *C. atrum,* supra nigro-æneum, scabrum, elytris punctis impressis inauratis triplici serie.

Long. corp. lin. 15.


*laterale.* 6. *C. æneum* nitidum, thorace elytrisque margine viridi, his striis crenatis, punctis elevatis triplici serie.


*Habitat* in Brasilia. D. Hancock.

This insect stands in the Banksian cabinet as *Carabus calidus* Fabr.; but since that specimen was not labelled by Fabricius, and does not agree either with his description or that of Olivier, I conceive my insect to be nondescript.

curvipes. 7. *C. nigro-æneum, obscurum, elytris striatis: punctis impressis inauratis triplici serie, tibiis posterioribus arcuatis.*

_Habitat in Brasilia._ D. Hancock.

Præcedenti simillimum sed minus, supra magis obscurum, tactu scabrum. _Caput et Thorax punctulis minutissimis confertissimis confluentibus tecta; hic totus concolor postice angustior._ _Elytra fere ut in præcedente, sed unicolora nec margine viridi: striis interstitiis haud punctatis, et omnibus transverse impressolineatis._ Puncta impressa inaurata triplici serie. _Epipleura postice magis conspicua._ _Tibiae quatuor posteriores arcuatae._

(Buprestidae).

_Buprestis._

pulchella. 8. *B. elytris acuminatis scabris: fasciis duabus obscuris albis, corpore lineari cyano._

_Habitat in Australasia._ D. MacLeay.

_Corpus angustum, lineare, cyaneum, punctatum. Caput orbicularatum, postice longitudinaliter impressum. Antennæ breves, serratae._ _Thorax ex rugulis transversis scaber, postice utrinque elevatus et in medio foveatus._ _Scutellum transversum, brevisimum, supra linea elevata._ _Elytra amæne violacea, ex granulis complanatis scabra, sericeo-obscura, pone medium utrinque tumida, basi in medio impressa, apice attenuata et extus mucrone
Mr. Kirby's Century of Insects.

mucrone valido acuto armata. Fasciae duæ obsoletæ pilos-albidæ ante apicem in elyro cernendæ.

jucunda. 9. B. elytris serratis cyaneis: fascia postica punctoque laterali sanguineis, thorace canaliculato.


Habitat in Brasilia. D. Hancock.


At first I mistook this beautiful insect for B. equestris Fabr.; but the terms—Corpus aneum—sterno parum porrecto—Elytra punctorum duorum par, by no means agreed with it: and when I further compared it with Olivier's B. haemorrhoidalis, to which Fabricius refers as synonymous with his B. equestris, I was fully convinced that they were distinct species; since from Olivier's figure it appears that B. haemorrhoidalis is little more than half the size of B. jucunda; and in the former the three last ventral segments of the abdomen are red, whereas in the latter they are green*

amaena. 10. B. elytris serratis, apice bidentatis, cyaneis, striatis: fascia postica subarcuata testacea.


Var. β. minor, cyanea: elytris fascia vix arcuata lutea: thoracis dorso foveolis binis impressis. An eadem?

leucosticta. 11. B. elytris serrulatis atro-violaceis scabris: punctis sparsiis albis, corpore aurato-viridi.

Long. corp. lin. 6—6½.

Habitat in Australasia. D. MacLeay.

β. in Mus. D. Brown.


Var. β. capite thoraceque aurato-viridibus; elytris purpurascen-tibus.

(Elateridæ.)

Elater.

pubescens. 12. E. niger, thoracis lateribus linea intermedia liturisque duabus obliquis, elytrorumque lateri exteriori, pallidis.

Long. corp. lin. 9½.

Habitat in Brasilia. D. Hancock.

Corpus

13. E. testaceus, thorace linea dorsali, coleoptris vittis tribus, antennisque, nigris.

Long. corp. lin. 17½.

Habitat in Brasilia. D. Hancock.


cornutus. 14. E. testaceus, capite bicorni, thorace lineis duabus dorsalibus interruptis, coleoptrisque vittis tribus atris.


Habitat in Brasilia. D. Hancock.

Corpus dilute testaceum, nitidum, subtus utrinque vitta, sæpius interrupta,

These two insects seem nearly allied to three species of Fabricius, *E. sutable*, *bicorns*, and *vespertinus*; but at the same time they appear to be quite distinct from them. From the first they are sufficiently distinguished by having no lateral thoracic tooth or spine; from the second in their colour, *E. bicornis* being entirely black; and from the third in the colour of their head and antennae. From the different shape of the last joint of their palpi, and from the remarkable pair of impressions on the anal segment of the underside of the abdomen, these insects should form a distinct family, if not a distinct genus.

(Cebrionidae.)

**Anelastes** Kirby.

*Labrum* tectum, minutum, apice rotundatum.
*Labium* subquadratum, bifidum.
*Mandibulae* exsertae, edentulae, incurvae, acutae.
*Palpi* brevissimi, filiformes. *Maxillares* articulo extimo paulo majori, oblique truncato.
*Antennae* filiformes, moniliformes: articulo extimo sublunato.
*Corpus* lineare, subcylindricum.
*Pectus* inerme.

This
This genus connects Latreille's tribe of *Cebrionites* (Cebrionidae K.) with the *Elateridae*. It differs from all the present genera of that tribe in its moniliform antennae and short palpi, and more especially in having its labrum quite concealed by the clypeus. From *Elater*, which in habit it most resembles, it is distinguished not only by these circumstances, but also by its pretended mandibles and deflexed sternum.

**Druri.** 15. A.

**Plate XXI. Fig. 2.**


*Habitat*—Ex Mus•o D. Drury.


**Rhipicera** Latreille.

PLATE XXI. FIG. 3.


Habitat in Brasilia. D. Hancock.


The Brasil species of this genus vary from those of New Holland (one of which I shall hereafter have occasion to describe) in having only one tooth near the inner base of each mandible; whereas in the latter there are two. The last joint of the palpi of this is cylindrical, while in R. marginata it is subovate or ovato-lanceolate. Hence may be formed two natural families in the genus, *Mandibulis intus unidentatis; **Mandibulis intus bidentatis.

(Lampyridæ.)
(Lampyridae.)

Lampyris Linn.

*Ovata.*

Latreillii. 17. L. elytris nigris testaceo-lineatis, antennis masculis disticho-flabellatis, femineis disticho-serratis.

Plate XXI. Fig. 4.


♀. lin. 13.

Habitat in Brasilia. D. Hancock.

♂.


♀.

Antenneae undecim-articulatae, imbricatim disticho-serratae.

In honorem viri amicissimi, Entomologorum hodiernorum facile principis, D. P. A. Latreille, Galli.

Illigeri. 18. L. thorace lituris duabus elytris unica laterali ba-sis, pallidis, antennis flabellatis.

Long. corp. lin. 10.

Habitat in Brasilia. D. Hancock.

In honorem viri doctissimi, et in Entomologia heu desideratissimi, D. Illigeri, Borussi.

Savignii. 19. L. thorace fenestrato pallido; dorso marginæque nigris: vitta laterali abdomenque pallidis.

Long. corp. lin. 9½.

Habitat in Brasilia. D. Hancock.


In honorem Zoologæ Ægypti peritissimi interpretis, in Entomologia oculatissimi, D. J. C. Savigny, Galli.

(Cleridae.)

I exclude from this tribe two genera placed in it by Latreille, (Mastigus Hoff. and Scydæanus Latr.), but which, having little affinity with it, had better stand by themselves, and then divide it into two sections: the first containing those with serrated antennæ (serricornes), and the second those with clavated (clavicornes).

* By this term I distinguish the phosphoric spots on the thorax of Elater noctilucus; and those also on the ventral segments of the abdomen of Lampyris. *Serricornes.
* Serricornes.

Eurypus Kirby.

Labrum transversum, integrum.
Labium bifidum.
Palpi omnes articulo extimo majori, securiformi.
   maxillares quadriarticulati.
   labiales biarticulati.
Antennae serratae.
Thorax subquadratus.
Corpus depressum.

Tillus Fabr.

Labrum transversum, integrum.
Labium minutum, integrum.
Palpi maxillares filiformes, triarticulati.
   labiales biarticulati: articulo extimo maximo, securiformi.
Antennae serratae.
Thorax cylindricus.
Corpus convexum.

Axina Kirby.

Labrum emarginatum.
Labium bifidum?
Palpi omnes articulo extimo magno, securiformi.
   maxillares triarticulati.
   labiales biarticulati.
Antennae serratae.
Thorax cylindricus.
Corpus subdepressum.

Priocera Kirby.

Labrum emarginatum.
Labium bifidum.

3 e 2

Palpi
Palpi maxillares filiformes, quadriarticulati: articulo extimo compresso, oblongo.
labiales triarticulati: articulo extimo magno, petiolato, securiformi.

Antennae serratae.
Thorax teretiusculus, postice valde constrictus.
Corpus convexum.

Latreille’s character of Tillus in Cuvier’s Règne Animal*, “où la majeure partie des antennes est en forme de scie, et où les tarses, vus sur les deux faces, ont cinque articles très-apparens,” would include the four genera I have here defined. But the other characters exhibited by them, both as to their habit and general form, and their oral instruments, are so different, that every entomologist who at all adopts that learned author’s system would consider them as good genera. Thus in Eurypus and Tillus the labrum is entire, while in Axina and Priocera it is emarginate.
Again, the labium in Tillus is entire, but in the three other genera bifid. In Eurypus and Axina all the palpi terminate in a securiform joint; in Tillus and Priocera, only the labial ones. In Eurypus and Priocera the maxillary palpi consist of four joints; in Tillus and Axina, only of three. In Eurypus, Tillus, and Axina the labial palpi are biarticulate, but in Priocera they are triarticulate. In Eurypus the thorax is square; in Tillus and Axina, cylindrical; and in Priocera, constricted behind.

Eurypus.

rubens. 20. E.

Plate XXI. Fig. 5.

Habitat in Brasilia. D. Hancock.

* iii, 254.

Axiina.-
analis. 21. A.

Plate XXI. Fig. 6.


Habitat in Brasilia. D. Hancock.


Priocera. variegata. 22. P.

Plate XXI. Fig. 7.

Habitat in Brasilia. D. Hancock.


** Clavicornes.
**Clavicornes.**

**Enoplium Latr.**


*Long. corp. lin. 6.*

*Habitat* in Brasilia. D. Hancock.


The first joint of the tarsi in this genus is scarcely visible under a strong magnifier; so that they may rather be regarded as tetramerous than pentamerous insects.


*Long. corp. lin. 7½.*

*Habitat* in Brasilia. D. Hancock.

*Corpus* lineare, rufum, punctatum, subhirtum. *Caput* et *Thorax* figura

**Clerus Latr.**

Nutalli. 25. C. cyaneus, elytris rubris: sutura, fasciis tribus, punctoque humerali, cyaneis.

Long. corp. lin. 4.

_Habitat_ in America septentrionali, prope flumen Missouri. D. Nutall.


(Histeriæ.)

**Hister Linn.**


Long. corp. lin. 5.

_Habitat_ in Brasilia. D. Hancock.

Corpus latum, subquadratum, læve, nitidum, aterrimum. Caput inter oculos litera Æ Græcorum (qua nota ab omnibus reliquis Histeribus differt) impressa signatum. Thorax dorso lævissimus: lateribus minutissime et absque lente forti vix conspicue punctulatis. Punctum majusculum valde impressum ante scutellum. Elytra pone humeros subsinuata, brevissima, quadristriata:

**Hololepta** Paykull.

*flagellata*. 27. H. atra, elytris bistriatis, abdomine segmento penultimo utrinque sulcato.

_Habitat_ in Australasia.


(_Nitidulidae_.)

**Nitidula** Fabr.

*hemisphaerica*. 28. N. nigra, supra viridis, abdomine pedibusque flavis.

_Long. corp. lin. 2½._

_Habitat_ in Brasilia. D. Hancock.


_VOL. XII._

3 p (Scarabæidae.)
(Scarabeidae.)

Copris.

floriger. 29. C. thorace viridi-æneo: cornubus duobus elevatis, subincurvis nigris, capitis erecto apice complanato subemarginato.

Long. corp. lin. $9\frac{1}{2}$.

Habitat in Brasilia. D. Hancock.

Affinis C. splendidulo et conspicillato Fabr. sed alia.

♀.


♂.

Femina altero sexu paulo major, clypeo haud cornuto, transverse carinato, thorace antice foveato: fovea parva viridiæneo; dentibus tribus nigris obsoletis obtusis in triangulo obtusangulo dispositis, armato, macula magna dorsali nigra lobata; lobis recurvus florem expansum quodammodo simulante, cornubus dorsalibus foveave postica nullis. Corpus subtus totum atrum: femoribus quatuor posticis solumnmodo nigris.

Var. β.
Var. β. thorace femoribusque quatuor posticis supra, cupreopauratis: macula thoracis dorsali minori; lobis vix recurvis.

This species is nearly related to *C. splendidulus* and *conspicillatus* Fabr. From the former it is distinguished not only by having the horn on the head flattened instead of compressed at its apex, but the thoracic horns are narrower and more elevated, and the fovea does not extend the whole length of the thorax: besides, in *C. splendidulus* the horn terminates near the anterior margin of the thorax in a prominent tooth, which is wanting in *C. floriger*. *C. conspicillatus* is also a native of Brasil; but the thorax of this is very retuse anteriorly, and armed with two teeth only, which is not the case with the insect I have described. The insects in question, with several other species, vary from *Copris* in their antennae and some other characters, and form a connecting link between *Onitis* and that genus.

**Onthophagus Latr.**


*Habitat* apud Promontorium Bonæ Spei. D. Green.


This insect seems to vary somewhat from the habit of *Onthophagus*, and forms an intermediate link between it and *Copris.*

Habitat in Australasia.


Capella. 32. O. niger, thorace antice retuso bituberculato, clypeo punctato, occipite lamina lata bicorni. Long. corp. lin. 6½.

Habitat in Australasia.


Habitat in Australasia. D. MacLeay.

Corpus nigrum, subtus pubescens. Caput rugoso-punctatissimum: occipite punctis sparsis. Clypeus antice attenuatus, apice sub-emarginatus, postice linea transversa elevata subundulata. Vertex transverse obsolete carinatus. Thorax antice retusus tricornis:
Mr. Kirby’s Century of Insects.

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Scarabæus Latreille.

Æneas. 34. S. thoracis cornu incurvo bifido: lobis acutis, capitis recurvo compresso simplici, elytris brevibus.

Habitat in Brasilia. D. Hancock.


This species has considerable affinity with Geotrupes bilobus Fabr.; but the elytra are not striated, and the lobes of the thoracic horn are acute.

Ascanius. 35. S. thorace antice retuso mucronato, clypeo emarginato.

Habitat in Brasilia. D. Hancock.

Corpus
Mr. Kirby’s Century of Insects.


This species appears to be related to Geotrupes Zoilus Fabr.; but it is of a different colour, and considerably larger than that insect as figured by Olivier.

Melolontha Fabr.

aurulenta. 36. M. cupreo-aurata, subtus piloso-incana, thorace fovea dorsali fundo carinato, clypeo emarginato.

Long. corp. lin. 4.

Habitat in Australasia. D. MacLeay.


Obs. An hujus generis?
GENIATES Kirby.

Labrum transversum, antice obtusangulum, subtus processu parvo inflexo munitum.
Labium transversum, latissimum, breve, medio acuminatum, basi palpigerum.
Mandibulae subarcuatæ, corneæ, validæ, apice emarginatæ.
Maxillæ mandibuliformes, subarcuatæ, corneæ, validæ, apice tridentatæ.

Antennæ novem-articulatæ: clava triphylla, elongata, lineari-lanceolata, pilosa.
Pectus et Postpectus inermia.

Tarsi antici masculi articulis quatuor primis dilatatis subtus scopula pilorum dense pulvinatis.
Unguiculi posteriores externi apice bifidi, antici pollice basi instructi.

APOGONIA Kirby.

Labrum postice rotundatum, antice medio acuminatum.
Labium transversum, medio subacuminatum, basi palpigerum.
Mandibulae subarcuatæ, corneæ, validissimæ, apice fornicatæ, subemarginatæ.
Maxillæ mandibuliformes, brevissimæ, corneæ, apice edentulæ subemarginatæ.
Palpi subclavati.
Antennæ decem-articulatæ: clava triphylla, sublanceolata, pilosa.
Pectus et Postpectus inermia.
Unguiculi omnes apice bifidi.

ANOPLOGNATHUS Leach.

Labrum transversum, antice medio acuminatum.
Labium quadratum, medio acuminatum, sub apice palpigerum. Mandibulae
Mandibulae breves, validissimae, cornae, apice edentulae integer-rimae extus rotundatae intus acutae incurvae.
Maxillae mandibuliformes, arcuatæ, breves, validæ, cornæ, lobo edentulo fornicato, apice subemarginato.
Palpi subclavati.
Antenneæ decem-articulatæ: clava triphylla, semiovata, pilosa.
Poststernum caput versus protensum, conicum.
Unguiculi omnes simplices.

I have given the characters of Anoplognathus, as well as of the two genera I have here established, that I might afford a clearer view of those particulars in which they differ, in order that the claim of the latter to be considered as distinct genera may be more readily perceived. In habit and external appearance they certainly appear very unlike each other; but their oral organs are upon the whole so similar, that from these they might perhaps be thought to belong to the same genus, and be well arranged under Anoplognathus. A near view of them, however, will I trust justify me for giving them as distinct.

In the first place, Anoplognathus is distinguished, besides its general habit which at first sight appears different, from both Geniates and Apogonia by the remarkable protended conical poststernum observable in all the species of that genus; in the next, by having all its claws simple and undivided; in this respect resembling Rutela. Its labium also is of a different shape, unless it may be regarded as connate with the mentum. From Geniates it differs in having maxillæ without teeth at the end and very concave, and, which is important, its antennæ have one more joint. Those remarkable circumstances, peculiar to the males of Geniates, of a stiffly-bearded mentum and dilated anterior tarsi, furnish also a striking distinction. From Apogonia it may be known
known not only by the particulars before noticed, but also by its transverse labrum, its entire and very concave maxillæ, and by the elytra covering all the joints of the upper side of the abdomen but the last; whereas in *Apogonia* the two last joints are uncovered. *Geniates* may be distinguished from *Apogonia* not only by this last circumstance, in which it agrees with *Anoplognathus*, but also by having a transverse labrum, maxillæ armed with three teeth, by the insertion of its head, which is inclined towards the horizon, whereas in *Apogonia* it is nearly vertical, by having a joint less in its antennæ, by the beard on its chin, and remarkable dilated anterior tarsi before noticed, by having only its exterior claw, and not both, bifid at the apex; and lastly, by the remarkable thumb-like process at the base of the inner anterior claw.

**Geniates.**


**Plate XXI. Fig. 8.**

Long. corp. lin. 8½.


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ternis apice bifidis, antici dilatati subtus scopula densa rigida pulvillati, triunguiculati: ungue intermedio longiori bifido, interno brevi arcuato obtuso polliciformi.

Obs. Fœminæ mentum imberbe, tarsi antici vix dilatati.

Another insect in my cabinet, which I regard as Melolontha ruficollis Fabr., but which comes from Brazil, is distinguished by dilated anterior tarsi, and may perhaps belong to this genus. Its labrum, however, is triangular, with the vertical angle emarginate, and the acumen of the labium is also emarginate; in other respects its oral instruments agree with those of Geniates.

**Apogonia.**

*gemellata.* 38. A.  

- **Plate XXI. Fig. 9.**

*Habitat in Brasilia?*


The species here described agrees in many respects with Fabricius's description of Melolontha geminata; but the term "caput læve" at once indicates their difference, since in my insect the head as well as the thorax is thickly covered with deeply-impressed points.

Año-
Anoplognathus Leach.


Long. corp. lin. 11.

Habitat in Australasia.


Long. corp. lin. 11.

Habitat in Australasia.


Rutela Latr.

pulchella. 41. R. viridi-lutea, thoracis dorso, scutello, elytrisque fascia lunari, viridibus.
PLATE XXI. FIG. 10.

Long. corp. lin. 8¼.

Habitat in Brasilia. D. Hancock.


Liturella. 42. R. viridi-lutea, supra viridis, thorace lateribus linea dorsali elytrisque vittis duabus luteis.

Long. corp. lin. 5¼.

Habitat in Brasilia. D. Hancock.


cyanipes. 43. R. oblonga, aurato-viridis, pedibus cyanicis.

Long. corp. lin. 17.

Habitat
Habitat in Brasilia. D. Hancock.


Goliathus Lamarck.

fasciatus. 44. G. fuscus albido irroratus, thorace viridescenti, elytris fascia obliqua nigra, clypei cornibus emarginatis.

Long. corp. lin. 15 ½.

Habitat in Brasilia. D. Hancock.


inscriptus. 45. G. fuscus albido irroratus, thorace viridescenti, elytris litera n reversa nivea inscriptis, clypei cornibus apice rotundatis.


Habitat in Brasilia. D. Hancock.

Simillimus praecedenti, sed minor. Clypeus cornibus apice rotundatis.
Mr. Kirby's Century of Insects.

datis. *Elytra* punctis et maculis pollinoso-subcinereis obscurioribus. In utroque elytro litera \(n\) reversa alba conspicienda.

**Trichius Fabr.**


*Habitat* in Brasilia. D. Hancock.


**Cetonia Fabr.**


*Plate XXI.* **Fig. 11.**

*Habitat* in Insula Luconia prope Manillam. D. Davidson.


This beautiful insect was brought from Manilla by Mr. Simon Davidson, Surgeon in the Royal Navy, who purchased several of them in a shop, where its elytra and those of some splendid *Buprestes* were sold as ornaments for ladies' head-dresses.

*insculpta.* 48. *C. thorace* lobato, livida, tota lunulis nigris insculpta, elytris macula apicis lunata nigra.


*Habitat* in Brasilia. D. Hancock.

*Corpus* subtus glaucum, supra lividum, totum lineolis plus minus arcuatis, interdum confertis, in prona pagina sæpius brevissime setigeris,

reliculata. 49. C. thorace lobato, subpilosa nigra, fulvo maculata, elytris obsolete reticulatis, oculorum septo bicarinato.


Habitat in Brasilia. D. Hancock.


(Lucanidæ.)

Lucanus Linn.

nebulosus. 50. L. niger, obscurus, mandibulis recurvis thorace canaliculato inaequali, elytris fuscis cinereo-nebulosis.
PLATE XXI. FIG. 12.

Long. corp. mandibulis exclusis, lin. 10.  
mandibularum, lin. 2\frac{3}{4}.

Habitat in Australasia. D. MacLeay.


This species differs from the other Lucani in having a bifid mentum, recurved mandibulae (in which it agrees with Lamprima Latr.), and palpi with curved articulations; but its broken antennæ with a pectinated clava, and depressed body, prove that it is more nearly related to Lucanus than to Lamprima, in which the body is more convex, the antennæ unbroken with a lamellated clava. It seems scarcely entitled to be considered as distinct from Lucanus; but at any rate it forms a family in that genus.
Mr. Kirby's Century of Insects.

**COLEOPTERA HETEROMERA.**

*(Tenebrionidae.)*

**Psammodes Kirby.**

*Labrum* emarginatum.

*Labium* bifidum : lobis divaricatis.

*Mandibulae* apice conniventes, bidentatae.

*Maxillae* basi apertae.

*Palpi* filiformes, *maxillares* elongatae.

*Mentum* trapeziforme.

*Antennae* graciles, subclavatae: clava triarticulata.

*Corpus* oblongo-ovatum.

This genus is intermediate between *Pimelia* and *Tentyria*: from the former it is distinguished by its bifid labium, by its quadrangular mentum, narrowest below so as not to cover the base of the maxillae, and by its long, slender, clavate antennae; and from the latter, besides these characters, by its emarginate labrum. It is to be observed, that in this latter organ *Pimelia muricata* and *his-\(\text{T}\)pida* differ from each other, as well as in their antennae, and the form of their bodies; hence the genus might be divided into two families, *Corpore subgloboso*, **Corpore oblongo.**

**longicornis.** 51. *Ps. niger*, cinereo-setosus, antennis elongatis, elytris granulatis scabris.

**PLATE XXI.** **FIG. 13.**

*Habitat* apud Promontorium Bonæ Spei. D. Green.

*Pimelia brunnea* et *lavigata* Oliv. congener et affinis: abamba- bus differt antennis longioribus, a priori colore nigro et capite postice, nec antice, punctato, et a posteriori thorace excavato-

Oxura Kirby.
Labrum subquadratum, subemarginatum.
Labium bifidum: lobis divaricatis.
Mandibulae breves, apice bidentatae.
Maxillæ basi apertæ.
Palpi maxillares elongati: articulo extimo magno, securiformi, labiales filiformes.
Mentum fere trapeziforme.
Antennæ medio attenuatae, subclavatae: clava triarticulata.
Corpus lineare.

3 ii 2

Caput
Mr. Kirby’s Century of Insects.

Caput rhomboidale: oculis prominulis triangularibus.  
Thorax teretiusculus, vix marginatus.

The characters which distinguish Oxura from Psamnodes, which it much resembles, are principally the last joint of the maxillary palpi, which is securiform, its linear body, its rhomboidal head contracted almost into a neck behind the eyes, its prominent triangular eyes, its barrel-shaped thorax with scarcely any margin, and its elytra furnished with a mucro at their apex like those of a Blaps

Habitat apud Promontorium Bonæ Spei. D. Green.

Mr. Kirby’s Century of Insects.

Scotinus Kirby.

Labrum bifidum.
Labium bifidum: lobis divaricatis.
Mandibulae apice conniventes, dentatæ.
Maxillæ basi apertæ.
Palpi crassiusculi: articulo extimo majori obtriangulari.
Mentum bifidum: lobis divaricatis.
Antennæ moniliformes, apicem versus subcrassiores: articulo extimo brevissimo vix distincto.

Corpus ovatum, marginatum.

This genus resembles Erodius and Asida in the last joint of the antennæ, but it differs from them both in the labrum, labium, and mentum. With Erodius it has a bifid sternum; its clypeus, however, is not bifid, in which it agrees with Asida, but the sternum of the latter genus is entire.

crenicollis. 53. Sc. subcinerea obscura, thoracis margine crenato.

Plate XXI. Fig. 14.

Long. corp. lin. 9½.

Habitat in Brasilia. D. Hancock.


Mr. MacLeay possesses a smaller species of this genus, also from Brasil, distinguished from S. crenicollis by having the margin of the thorax entire, and that of the elytra crenate.

Sphærotus Kirby.

Labrum transversum, apice rotundatum ciliatum.
Labium minutum, apice truncatum.
Mandibulae vix dentatae.
Maxillae basi apertae.
Palpi maxillares incrassati: articulo extimo maximo, securiformi. labiales articulo extimo paulo majori, subcampanulato.
Mentum apice truncatum, basi rotundatum, medio valde convexum.
Antenne extrorsum subcrassiores: articulo extimo oblique truncato.
Corpus globoso-ovatum, immarginatum.

This
This genus in habit much resembles *Moluris* Latr.; but the bi-
fid labium, cordate mentum, subfiliform palpi, and antennæ ter-
minated by an ovate acute joint, which distinguish the latter, 
sufficiently warrant me in considering them as distinct.

**PLATE XXI. FIG. 15.**

Long. corp. lin. 5½.

*Habitat* in Brasilia. D. Hancock.

*Corpus* globoso-ovatum, glaberrimum, nitidiusculum, nigro-aene-
um. *Caput* orbiculatum, levissime punctulatum. *Clypeus* sub-
triangularis, a fronte sutura profunda separatus. *Antennæ* api-
cem versus, paulo crassiiores: articulo primo brevi obconico 
sequentibus vix crassiori, secundo brevissimo subgloboso, tertio 
sequentibus paulo longiori subclavato, reliquis longitudine 
sensim decrescentibus plus minus obconicis: extimo oblique 
truncato. *Thorax* convexus, levissime punctulatus, antice sub-
emarginatus, postice transversus subemarginatus, lateribus ro-
tundatis tenuissime marginatis. *Scutellum* minutissimum. *Co-
leoptra* subglobosa, seriatim quasi variolosa: variolis obscuris 
graciles, arcuatae: calcaribus duobus minutissimis obsoletis. 
*Tarsi* pulvillati.

**Strongylium** Kirby.

*Labrum* transversum.

*Labium* subcordatum.

*Mandibulae* brevissimae, validæ, apice edentulæ acutæ.

*M maxillæ* apertæ, apice bilobæ: lobo exteriori majori extus rotun-
dato, interiori minuto acuto.

*Palpi* articulo extimo magno securiformi.
Mentum fere cordatum.

Antennæ apicem versus sensim crassiores: articulo extimo sub-ovato.

Corpus lineari-oblongum, immarginatum.

This genus in many respects resembles the preceding. But the labium, mentum, and labial palpi are different: the body also is oblong, the thorax has no margin, and the tarsi no pulvillus; circumstances which combined satisfactorily establish their claim to be considered as distinct genera.

chalconatum. 55. Str.

PLATE XXI. FIG. 16.


Habitat in Australasia.


EURYNOTUS Kirby.

Labrum transversum, emarginatum.

Labium fissum, brevissimum, submembranaceum.

Mandibulæ
Mandibulae validae, conniventes, apice bidentatae.
Maxillae basi apertae.
Palpi articulo extimo majori securiformi.
Mentum quadrangulum: lateribus rotundatis, subcarinatum.
Antennae extrorsum crassiores: articulo extimo orbiculato.
Corpus oblongum, apertum.
Tarsi anteriores quatuor dilatati, pulvillati.

Eurynotus is distinguished from Pedinus Latr., to which it is nearly allied, in having a much larger and more conspicuous labrum, and a clypeus though emarginate not cleft. The four anterior tarsi of the males, and not the first pair only, are dilated. The thorax also is widest behind, whereas in Pedinus it is widest in the middle.

muricatus. 56. E.

Plate XXII. Fig. 1.

Long. corp. lin. 7½.

Habitat—Unde accepi non reminiscor.

Mr. Kirby's Century of Insects.

Adelium Kirby.

Labrum subquadratum, subemarginatum.
Labium bifidum.
Mandibulae breves, apice conniventes bidentatae.
Maxillae basi apertae.
Palpi maxillares articulo extimo maximo obtiangulari subcompresso.
labiales brevissimi, filiformes.
Mentum subtrapeziforme, inaequale.
Antenneae filiformes: articulo extimo oblongo.
Thorax brevissimus.
Corpus oblongum, apterum.

This genus has little affinity with any other of this tribe: the species of it, unless closely examined, would be set aside as belonging to Calosoma or Carabus. They are however heteromerous, and belong to the Tenebrionidae. I know only three species, the two here described, and the other Calosoma porculatum of Fabricius. They are all New Holland insects.

calosomoides. 57. A. nigro-aeneum, nitidiusculum, thorace utrinque impresso, elytris punctato-striatis.

Plate XXII. Fig. 2.

Habitat in Australasia.

Corpus nigro-aeneum, nitidiusculum, glabrum. Caput orbiculatum, punctatum. Clypeus apice truncatus, postice linea impressa curva a fronte separatus. Antenneae filiformes, thorace longiores, pilosæ, nigrae: articulo primo reliquis paulo crassiorc,
Licinoides. 58. A. æneo-nigrum nitidum thorace utrinque impresso, elytris substriatis punctatis, tarsi rufis.

Habitat in Australasia. D. Francillon.


(SphéniScus Kirby.

Labrum transversum, integrum.
Labium minutum, cuneiforme.
Mandibulae apice conniventes.
Maxillæ basi apertæ.

Palpi omnes articulo extimo magno, minus compresso, obtriangulari.
Mentum oblongum, convexum, apice subemarginatum.
Antennæ extrorsum crassiores, serratae: articulo extimo subrhomboidali oblique truncato.
Corpus ovato-obcuneiforme: elytris gibbosis.
The habit of this genus is at first sight very much that of one of the gibbous *Erotyli*; but it is heteromerous, and belongs to the present tribe, and, with many others equally distinct, may have been arranged under *Helops*. It however possesses very few characters in common with the genuine species of that genus, *H. chalybeus*, &c., differing in antennæ, labium, mentum, palpi, and general habit.

erotyloides. 59. Sph.

**Plate XXII. Fig. 4.**

**Long. corp. lin. 8.**

*Habitat* in Brasilia. D. Hancock.


**Stenochia**
Stenochia Kirby.

Labrum transversum, apice rotundatum.
Labium minutum, cuneiforme.
Mandibulae apice conniventes.
Maxillae basi apertae.
Palpi omnes articulo extimo minus compresso, obtriangulari.
Mentum subtrapeziforme, disco subelevatum.
Antenne extrorsum crassiores: articulo extimo oblongo.
Corpus lineare, angustum.

This genus possesses many characters in common with the preceding; but it is sufficiently distinguished by its antennae, which are not at all serrate, by its linear body, and cylindrical thorax. I possess two species distinguished by the same character.

rufipes. 60. St. virescens, supra cyanea, elytris fasciis duabus luteis margine connexis, antennis pedibusque rufis.

Plate XXII. Fig. 5.

Long. corp. lin. 8.

Habitat in Brasilia. D. Hancock.

Corpus lineare, angustum, subtus virescens, ex pilis brevissimis micantibus sericeum. Caput postice confluenter punctatum caeruleum, antice pilis aureo micantibus ornatum. Clypeus antice transversus, postice rotundatus, linea curva impressa a fronte separatus. Palpi rufi. Antenne extrorsum crassiores, thorace longiores, rufae: articulo primo sequentibus crassiori obconico, secundo brevissimo, tertio vix quarto longiori, sed paulo tenuiori, ambobus clavatis, sequentibus obconicus et subturbinatis subcompressis, extimo oblongo-ovato obtuso. Thorax cylindricus, postice submarginatus, confluenter punctatissimus,
Mr. Kirby's Century of Insects.


cyanipes. 61. St. cyanea, antennis rufis, thorace brevissimo, elytris fasciis duabus fulvis margine connexis.


*Habitat* in Brasilia. D. Hancock.


I possess the mutilated remains of a third species without head or thorax, the legs of which are dirty-red, the elytra violet, and the fascia of the base of *St. rufipes* replaced by a large acute ovate pallid spot with the point towards the apex; the middle fascia does not reach the suture. In sculpture they resemble those of *St. cyanipes*; the abdomen and postpectus are green and hairy, but the hairs are not shining as in *St. rufipes*.

*(Mordellidae.)*

**Mordella** Linn.


Long. corp. lin. 6½.

*Habitat* in Brasilia. D. Hancock.

Corpus

This species in every respect so entirely resembles the other Mordellae, under which genus I only place those ano aculeato, that I do not conceive the difference of structure observable in its antennae, which may perhaps be a sexual character, a sufficient indication that it should form a distinct genus.

(Meloidae.)

Gnathiium Kirby.

Labrum transversum.
Labium minutissimum vix discernendum.
Mandibulae protensae, elongatae, apice incurvae, edentulae, acutissimae.
Maxillae apertae: lobo longissimo gracillimo.
Palpi filiformes: articulis cylindricis.
Mentum trapeziforme?
Antennae extrorsum crassiores: articulo extimo elongato-conico.
Corpus obcuneato-lineare.
Thorax campanulatus.

This genus comes next to Nemognatha Illig., from which it borrows that remarkable sexual character, of having the lobe of the maxillae, like those of a bee, almost as long as the body; but it differs in having a transverse instead of a circular labrum, in its mandibulae protended far beyond the labrum, in its incrassate antennae, which gives it some connexion with Mylabris. The shape of the head and thorax also is different. The insect is so minute that I have not been able to get a clear idea of the shape of the labium and mentum, but I think the latter is trapeziform.
Francilloni. 63. Gn.

PLATE XXII. Fig. 6.

Long. corp. lin. 2½.

Habitat in Georgia. Ex Mus. D. Francilloni a D. MacLeaio emptum et mihi benevole communicatum.


Memoriae Dni Francilloni, S. L. S. heu nimis deslendi, Musæi longe et late celebris benevoli possessoris, hoc insectum sacrum esto.

COLEOPTERA TETRAMERA.
(Curculionidæ.)

* Infracticornes.

Rhinotia Kirby.


This
This genus is related to *Brentus*; but its tridentate mandibulae and incrassate antennæ, taken in conjunction with its short and rather conical thorax, sufficiently distinguish it.

*haemoptera, 64. Rh.*

**Plate XXII. Fig. 7.**

*Long. corp. (Rostro excluso) lin. 7 3/4.*

*Habitat* in Australasia. *Ex Musæo D. MacLeay accepi.*

\( \beta \). *Ex Musæo D. Marsham.*


*Var. \( \beta \).* Thorace utrinque macula magna triangularis sanguinea, linea dorsali maculisque posticis nullis. Alias simillima. An eadem?

**Eurhinus Kirby.**

*Labrum* vix distinctum.

*Labium* subcordatum.

*Mandibulae* apice tridentatæ: dentibus æqualibus acutis.
Maxillæ apertæ.
Palpi brevissimi, conici.
Mentum cordatum.
Antennæ integrae, basi submoniliformes, apice clavatae: clava trifida perfoliata: articulo extimo in maribus longissimo cylindrico.
Corpus obtectum.
Thorax teretiusculus.

I sent a sketch of an insect of this genus to M. Latreille, and he was of opinion that it belonged to a genus he had constructed, but which is not yet published, under the name of Orthorhynchus. I have since been informed by him, that the type of that genus is Lixus semipunctatus Fabr., which from Olivier's figure appears to be more nearly related to Lixus bidentatus of Mr. Donovan, and is distinguished by acuminated elytra and filiform antennæ; whereas no species of Eurhinus, and there are several, has acuminated elytra, and the antennæ terminate in an oblong clava, the last joint of which, in the males, is very long. Olivier describes Lixus semipunctatus as antennis moniliformibus vix extrorsum crassioribus (v. 242. n. 242. t. xii. f. 141.) In L. bidentatus the antennæ are not moniliformes, but they are extrorsum vix crassiores. So that Orthorhynchus seems to be a connecting link between Eurhinus, the antennæ of which are submoniliform at the base, and Lixus bidentatus, but belonging to the same genus with the latter. There are several species of Orthorhynchus in Mr. MacLeay's rich cabinet. As Lixus semipunctatus is in the Banksian cabinet, it may be easily ascertained whether these observations are correct or not.

scabrior. 65. Eu. niger, piloso-incanus, elytris striatis, basi subtuberculatis, granulis tuberculibus acutis scabris.
PLATE XXII. FIG. 8.

Long. corp. (Rostro incluso) lin. 9.

Habitat in Australasia. D. Brown: MacLeay.


lævior. 66. Eu. niger, piloso-albus, elytris striatis, basi subcristatis, striarum interstitiis lævibus.

Long. corp. (Rostro incluso) lin. 7.

Habitat in Australasia. D. MacLeay.

Præcedenti similis sed minor, corpore angustiori albidiori. Antennae articulis brevioribus, 6º, 7º, et 8º globosis. Thorax lævior. Elytra striarum interstitiis lævibus, sed crista muricata est.

BRACHYCERUS Fabr.

* Thorace spinoso.

maculosus. 67. B. niger subcinereus, thorace spinoso late canaliculato, elytris nodulosis cinereo scratim maculosis.

3 x 2

Long.
Mr. Kirby's Century of Insects.


**Habitat** apud Promontorium Bonaæ Spei. D. Green.


*Thorace inermi.*

68. *B. ater,* thorace subcordato punctato, elytris globosis verrucosis.

_Habitat_ apud Promontorium Bonaæ Spei. D. Green.


This species is nearly related to *B. Spectrum* Fabr.; but the tubercles on the elytra are not disposed in rows as in that, being scattered irregularly.

**Rhinaria** Kirby.

*Labrum* vix distinctum.

*Labium* subtrapeziforme.

*Mandibulae* edentulae.

*Maxillae* apertæ.

*Palpi* brevissimi, conici.

*Mentum* quadratum.

Antennæ
Antennae integrae, capitatae: clava triarticulata; articulis arctissime connexis.

Corpus oblongo-ovatum.

Thorax subglobosus.

The insect, which is the type of this genus, is altogether of the habit of the Curculionidae fracticornes brevirostres, particularly Curculio asper, &c.: but its unbroken antennae place it in this section, from all the genera of which it is toto celo different. I found it in a collection of New Holland insects which I once purchased.

cristata. 69. Rh.

Plate XXII. Fig. 9.

Habitat in Australasia.

Mr. Kirby's Century of Insects.

corpus paginæ punctæ ocellata sparsæ utrinque conspici possunt.

**Fracticornes.

Cryptorrhynchus Illig.

corruscans. 70. Cr. cupreo-auratus, nitidissimus, pedibus cyaneis, corpore rhomboidali, thorace postice lobato.

Long. corp. lin. 4½.

Habitat in Brasilia. D. Hancock.


Leachii. 71. Cr. ater, unicolor, corpore rhomboidali, thoracis dorso elevato, pectore bicorni.

Long. corp. (Rostro excluso) lin. 5.

Habitat in Brasilia. D. Hancock.


Elytra

In honorem D. G. E. Leach, M.D.S.L.S., insectorum et animantium aliorum indefessi oculatissimi et perspicacissimi indagatoris.

Arnoldi. 72. Cr. ater, corpore rhomboidali, pectore bicorni, thorace rufo postice lobato.

Habitat in Brasilia. D. Hancock.


Observatori morum insectorum cordato, D. Arnold, M.D.S.L.S., hac species inedita dicatur.

Rynchænus Fabr.

Dufresnii. 73. R. subcylindricus, coleoptris maculis sex aurantiiis, basi triangulo magno obverso pallido.

Plate XXII. Fig. 10.

Habitat in Brasilia. D. Hancock.

Corpus subcylindricum, fere cuneiforme, subtus pilis decumentibus pallidum. Caput inflexum, nigrum, pilis pallidis, præcipue postice et ad basin rostri, consitum. Rostrum crassiusculum,

Viro mihi amicissimo, qui musæum insectis, avibus, conchyliis rarissimis exuberans collegit, ordinavit, Dno Dufresne, Musæi Regalis Parisiens. curatori digno, sit species hæc pulchra dicata.

Roddami. 74. R. oblongus, cinerascens, coleoptris verrucosis, fascis duabus albis.

Long. corp. (Rostro excluso) lin. 15₁/₂.

Habitat in Brasilia. D. Hancock.


**Reidi.** 75. *R. ovatus* ater, thoracis basi et apice, elytrisque fasciis margine connexis nigro-punctatis, flavis.

*Habitat* in Brasilia. D. Hancock.


_In honorem D. Geo. Roddam, M.D. et D. Dav. Reid, chirurgi, qui ambo plurima insecta hactenus inédita summo studio collegerunt, hoc Curculionidarum par nominatur._

**Curculio Linn.**

*Hancocki.** 76. *C. corpore squamoso: squamulis aurato-viride-scenti-cæsiis, coleoptris gibbis quadrituberculatis: humeris apicibusque mucronatis.*

_Plate XXII. Fig. 11._

*Habitat* in Brasilia rarissime, semel lectus. D. Hancock.

*In honorem* D. Hancock, *Classis Regia Navarchi*, qui innumeris insectis, quamplurimis ineditis, mei gratia in Brasilia collegit, et mihi benevolentissime dono dedit, hoc splendidissimum insectum nominavi.


*Habitat* in Australasia. D. Marsham.

*Corpus* ovato-oblongum, glabrum, obscurum, nigrum. *Rostrum* crassissimum, subcylindricum, basi utrinque crista compressa bifida: lobis rotundatis, apice ante antennas tuberculo compresso munitum, antice emarginatum: lobis divaricatis; labro intermedio triangulari. *Mandibulae* magnae, crassae, trigoneae, edentulae, supra rugolosae, apice acuta. *Antennae* articulis, primo

This species, as well as that which precedes it, would in a modern system doubtless form two genera, from the remarkable difference in their mandibles. But since, in a late number of German's *Magazin der Entomologie* (Zwieter Band, p. 339) the names of 52 genera of *Curculionidae* are given, amongst which these may probably be included, I judged it best to give them for the present as *Curculiones*.

Amico mihi semper facili et benevolo auctori *Entomologia Britannica* celebri hoc insectum sacrum esse volui.

elegans. 78. C. angustus, viridi-auratus, thorace vittis quatuor, elytris plurimis atris.

Plate XXII. Fig. 12.
Long. corp. (Rostro incluso) lin. 7¼.
Habitat in Brasilia. D. Hancock.

Animal elegantissimum, statura fere C. Sprengleri, sed angustius. Corpus ovato-lanceolatum, angustum, squamulis viridi-auratis micans, subtus subvillosum; lateribus nigro maculatis. Rostrum tetragonum, supra carinatum. Antennae clava lanceolata, quadrarticulata. Thorax subcylindricus, vittis alternis atris et viridi-auratis: his nigro punctatis, eleganter variatus. Elytra vittis, 3 l 2 lineolis,

(Cerambycidae.)

Prionus Fabr.


Plate XXII. Fig. 13.

Long. corp. lin 16.

Habitat in Brasilia. D. Hancock.


Viro in Entomologia apprime docto, oculatissimo, coadjutori strenuo utilissimo amicissimo Gulielmo Spence, S.L.S. hoc insectum ab amico suo dicatur.
LAMIA Fabr.

speculifera. 80. L. cinerea, thorace, elytrisque basi, spinosis, his lunula lævigata nitidissima.


Habitat in Brasilia. D. Hancock.

Affinis videtur L. tribulo et horridæ Fabr. sed penitus distincta.


annulicornis. 81. L. plumbea, thorace spinoso, utrinque albo, elytris carinatis latere albidis, antennis annulatis.

Long. corp. lin. 8½.

Habitat in Brasilia. D. Hancock.


fragifera. 82. L. fusca, thorace subspinoso, elytris apice cristatis, basi tuberculo fragiformi.

Habitat in Brasilia. D. Hancock.


aculeicornis. 83. L. oblonga cinerea, thorace spinoso, elytris basi subcristatis, antennis apice unguiculatis.

Habitat in Brasilia. D. Hancock.

Valde affinis L. Scorpioni, sed multo minor, elytris basi tantum cristatis. Corpus totum cinereum, nec subtus et thorace album. Tibiae item anticae haud dilatatæ—alias simillima.

This insect, as well as Lamia Scorpio, exhibits a most extraordinary character; the terminal joint of the antennae exactly resembles
bles a claw, such as arms the tarsi of many insects. This character, perhaps, would indicate a separate genus, but in every other respect these are true Lamiae. What may be the use of this claw is not ascertained; it is probably for the purpose of laying hold of surfaces.

**Cerambyx Linn.**

*hirticornis.* 84. C. ater, thorace sexspinoso testaceo nigro maculato, elytris testaceis dimidiato-nigris, antennis barbatis.

*Habitat* in Brasilia. D. Hancock.


**Stenocorus Fabr.**

*hirtus.* 85. St. piceo-æneus, hirtus, thorace submutico, elytris maculis duabus pallidis.

*Habitat* in Brasilia. D. Hancock.

*Corpus* lineare, nigro-piceum, æneo tinctum, pilis cinereis longusculis

Saperda Fabr.

hirsuticornis. 86. S. nigra, thorace elongato, utrinque vitta argentea, coleoptrisque aurea, antennis medio fasciculatim barbatis.

Habitat in Brasilia. D. Hancock.


scopulicornis. 87. S. rufo-picea, thorace elongato, elytris vitta aurea, antennis articulo quinto apice scopula stellari.

Habitat in Brasilia. D. Hancock.

Affinis præcedenti. Corpus lineare, angustatum, totum rufo-piceum, obscurum. Antenne mediocres, subtus pilis longis sparsis, barbatae: articulo quinto apice scopula quinque-radiata, sive

**Necydalis** Linn.

*N. aurulenta*. 88. N. aureo-pubescens, elytris subulatis fulvis: vitta laterali furcata nigra, antennis apice extus serratis.

*Habitat* in Brasilia. D. Hancock.


*barbicrus*. 89. N. nigra, elytris abbreviatis subulatis, macula hamata alba, tibiis posticis undique barbatis.

*Habitat* in Brasilia. D. Hancock.

*Corpus* lineare, angustum, nigrum, subtus piloso-incanum. *Caput* punctulatum, inter oculos canaliculatum. *Antennæ* breviore, extrorsum crassiores, apice intus serratae, rufo fuscoque variae.
Mr. Kirby's Century of Insects.


(Criocerideæ.)

Megalopus Oliv.

sextmaculatus. 90. M. flavus, subtus fascia, capitis vertice, thoracis dorso, coleoptrisque maculis sex, atris.

Long. corp. lin. 5.

Habitat in Brasilia. D. Hancock.


(Hispideæ.)

Alurnus Fabr.

rostratus. 91. A. fronte rostrata, supra testaceus, thorace vitta dorsali elytris apice, corporeque nigris.

Long. corp. lin. 7.

Habitat—Ex Musæo D. Drury.

Corpus lineare, angustum, glabrum, atrum. Caput rufum, clypeo in rostrum breve apice truncatum, supra sulco exaratum nigrum, subtus declive rufum, producto. Os sub capite inter oculos. Antennæ

This insect, which I purchased from the late Mr. Drury’s collection, appears to vary both from Alurnus and Hispa, and might perhaps constitute a new genus; but as my specimen has no antennæ, I have for the present considered it as an Alurnus.

(Chrysomelidæ.)

Lamprosoma Kirby.

Labrum subquadratum, apice deflexum.
Labium minutissimum, oblongum.
Mandibulæ apice incumbentes, edentulae.
Palpi crassi, subclavati.
Mentum minutissimum, oblongum.
Antennæ subclavatae: clava compressa subserrata.
Corpus hemisphaericum fere, dorso gibbo.
Caput inflexum, a thorace receptum.
Thorax postice lobatus.

One species of this genus has been described by Fabricius as a Chrysomela (C. Globus), and another by Olivier as a Eumolpus (E. globosus). It exhibits much more affinity to Clytra, from which however it is sufficiently distinguished by its labrum, mandibulæ, and palpi, as well as by the globose form of its body.

bicolor. 92. L. supra cupreo-fulgidum, subtus cyaneum.

Plate XXII. FIG. 15.

Long. corp. lin. 4½.

Habitat in Brasilia. D. Hancock.

S M 2

Corpus
Mr. Kirby's Century of Insects.


Chlamys Knoch.

Bacca. 93. Ch. atra, supra cupreo-aurata, thorace bilobo, elytris muricatis punctatis: sutura denticulata.

Habitat in Brasilia. D. Hancock.

minutissime rugulosus, cupreo-auratus, dorso elevato bilobo: lobis emarginatis, antice constrictus, postice lobatus, lobo bifi-
do. Coleoptra quadrata, tuberculato-muricata: tuberculis sub-
trigonis, anticis acutis, reliquis obtusis anterius excavatis: su-
turis denticulatis, lateribus profunde sinuata. Sternum ele-
vatum, os claudens. Femora subtus cuprea, pro receptione ti-
bianum longitudinaliter excavata. Anus inflexus. Segmenta
antica brevissima, et quasi plicata, anali profunde excavato.

This species seems to differ from the others of the genus in the
structure of its labial palpi, since they are not at all furcated.
Whether the other species have the sutures denticulated I do not
know, having only this species of the genus. Olivier does not no-
tice it. The circumstance is so unique and remarkable, that if
they have it not, it would indicate that C. Bacca belongs to a
distinct genus.

(Choragidae.)

Choragus Kirby.

Palpi subsetacei: articulo extimo acuto.
Antennæ clavæ: clava triarticulata, basi articulis duobus pri-
mis incrassatis.
Corpus cylindricum.
Caput inflexum: clypeo elongato.

After repeated examinations under a powerful magnifier, I have
not been able clearly to discover more than three joints in the
tarsi of this insect; but Mr. Curtis in one tarsus detected four.
Indeed its general habit, &c. connect it with the Tetramera, espe-
cially Cis and Cryptocephalus: it will not however well arrange
under any of the present families of that section of Coleoptera; I
have therefore considered it as the type of a new one, to which
some other nondescript genera in my cabinet belong.

Shep-
Mr. Kirby's Century of Insects.

Sheppard. 94. Ch.

Plate XXII. Fig. 14.

Long. corp. lin. \( \frac{3}{4} \).

Habitat in Anglia. Apud Offton in Suffolcia a D. Sheppard rarius lectus, strenue saltans.


Entomologo cordato oculatissimo Revetto Sheppardo, A.B. S.L.S. hoc insectum ab ipso solummodo adhuc inventum, et mihi benevole communicatum, merito dicatur.

ORTHOPTERA.

Blatta.

Mouffeti. 95. B. fusca, thorace antice reflexo utrinque angulato. Mouffet 130, fig. infima.

Kirby and Spence Introduct. to Entomology, ii. 329.

Long. corp. lin. 22.

Habitat in Brasilia frequens. D. Hancock.

Corpus
Corpus depressum, totum fuscum, obscurum. Caput utrinque sub oculos apud antennarum basin interne puncto pallido. Thorax supra rugosus, antice fulvus; margine antico emarginato, et laterali exciso, reflexis pallidis, disco gibbus. Tarsi articulis omnibus pulvillatis.

Var. β. Elytris, thoraceque luridis.

**MANTIS.**

*sinuata.* 96. M. fusco-cinerea, oculis spinosis, elytris sinuatis alarum longitudine.


Habitat in Brasilia. D. Hancock, .getJSONObject in Mus. D. MacLeay.

♂.


♀.

Antennae medio crassiores, duodecim-articulatae: articulo primo crassiori longiori cylindrico, secundo minimo cylindrico, terto elongato subclavato, reliquis cylindricis, ultimis quinque magnitudine sensim decrescentibus.

Those *Mantes* whose eyes terminate in a spine seem to form a separate family from the rest, if they may not rather be considered as a genus; for, besides the above singular character afforded by the eyes, their antennae are very different both in the number and form of the joints of which they are composed.
HEMIPTERA.

FULGORA.

Lathburii. 97. F. fronte rostrata ascendentia, elytris viridibus, albo flavoque ocellatis, alis luteis apice nigris.

Long. corp. lin. 18.


ARACHNIDES Lamarck.

(Phalangidæ.)

GONYLEPTES Kirby.

Character essentialis.

Mandibulae chelatae.

Palpi unguiculati.

Tarsi 6—10-articulati.

Character naturalis.

drico, intus aculeato: aculeis pluribus setiformibus mobili-
bus, ultimo subovato intus aculeato, apice unguiculato: un-
gue incurvo. Thorax suborbiculatus: lateribus marginatis in-
crassatis. Pedes octo: coxis sex anterioribus arcuatis basi
subcoalitis, intermediis longioribus, posticis duobus maximis
cum postpectore coalitis et vix linea impressa separatis, extror-
sum rotundatis, supra apice spina valida armatis, trochanteri-
bus brevibus cylindricis, femoribus cylindricis: posterioribus
spinosis genibus convergentibus, tibiis triarticulatis: articulo
primo brevi incrassato campanulato, secundo tenuiori longiori
cylindrico, terto gracili longo filiformi apice bicalearato, tarsis
filiformibus pilosis: anticus sexarticulatis, antepenultimis sep-
tem- vel undecim-articulatis, penultimis brevioribus sex- vel
septem-articulatis, posticis octo-articulatis: articulo primo ob-
soletiusculo, secundo reliquis longiori, penultimo brevissimo.
Tarsi omnes unguiculati, sed in quatuor anterioribus unguicu-
lus internus obsoletus. Sternum inter pedes sex anteriores an-
gustissimum, subcuneiforme. Poststernum inter coxas posticas
et ab eis linea impressa levi separatum, fere sagittatum, postice
utrinque spiraculo lunari pertusum. Abdomen brevissimum,
interdum retractum, segmentis brevissimis et quasi plicatis,
dorsalibus quatuor, ventralibus sex, analibus majoribus.

This genus belongs to Latreille’s Arachnides Trachéennes Holé-
tres, and should come before Phalangium, to which it is nearly re-
lated. It is sufficiently distinguished from that genus by its tri-
angular body, immense posterior coxae coalite with the postpec-
tus and scarcely separated from it, except anteriorly, even by an
impressed line; and more particularly by not having more than
eleven joints in any of its tarsi. The third joint of the tibiae may
by some perhaps be regarded as the first joint of the tarsus, but
the spurs which arm its apex sufficiently prove that it belongs to the tibiae. The knees of the hind-legs of these extraordinary insects converge; and being armed with spines, seem adapted to catch or retain their prey; and probably on this account it is that the coxae of these legs are so strong.

It seems to me that this genus and Phalangium, instead of coming after the Pycnogonidae, as Latreille has arranged them, should precede those marine animals, since their affinity to the spider tribe, scorpions, &c., is much greater.

aculeatus. 98. G. cornu oculigero inclinato, thorace aculeato: aculeo incurvo, coxis posticis extus spina bidentata.

Habitat in Brasilia. D. Hancock.


Habitat in Brasilia. D. Hancock.


Var. β. Abdomine subtus fusco rufoque marmorato.

scaber. 100. G. cornu oculigero bifido, thoracis disco seriatim tuberculato, coxis posticis spina apice recurva.

Habitat in Brasilia. D. Hancock.

No country has produced more novelties in every department of Natural History than New Holland; and the plants and animals of that insular continent, if I may so speak, are most of them of a peculiar character. Even such as are most nearly related to those of other climates usually exhibit some diagnostic that separates them from their correlatives, and indicates the region that gave them birth. Thus, the *Rhipiceræ* of New Holland are distinguished from those of South America by the teeth that arm the inside of their mandibles: their *Lucani*, (*L. nebulosus* Kirby, at least,) from those of other countries by their recurved mandibles and emarginate mentum. Not to mention the differences that separate *Anoplognathus* from *Geniates* and *Rutela*, or *Scarabæus proboscideus* from its affinities *Sc.mobilicornis, quadridens*, &c.

Mr. Brown, (who has so ably illustrated the Flora of New Holland, and whose observations and discoveries have diffused so much new light over the science of Botany,) when in that country did not overlook its zoological productions, and amongst other subjects collected many new and singular species of insects. Desirous of having these treasures described, and his time and attention,—to the great benefit of the botanical world,—being devoted
voted to another science; though fully competent to the task himself, he has requested me to lay a description of them before the Linnean Society, which I shall now do to the best of my ability, adhering to the plan begun in my former paper.

**COLEOPTERA PENTAMERA.**

*(Buprestidae.)*

**Buprestis Linn.**

**cruentata.** 1. B. viridis, elytris subacuminatis violaceis: fasciis duabus, maculaque antica laterali, sanguineis.

**Plate XXIII. Fig. 1.**

Long. corp. lin. 4.


**tricolor.** 2. B. viridi-aurata, elytris bidentatis, flavis: litura basis, sutura, fascia, maculaque apicis, violaceis.

Long. corp. lin. 5½.


*Elytra*
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Elytra striata: striis punctatis; interstitiis punctis sparsis, sor-dide flava: litura laterali postice hamata basis, sutura late; fascia angulata pone medium, maculaque apicis subtriangulari, cum macula elytri alterius lunulam formante, purpurascent-violaceis, vel cruce obversa lunula coronata.

phœorhæa. 3. B. viridi-aurata, elytris bidentatis subsulcatis luteis, apice fusco-purpurascentibus.

PLATE XXIII. FIG. 2.
Long. corp. lin. 43.


rusipennis. 4. B. atra nitida, elytris bidentatis sanguineis: sutura nigra.

Long. corp. lin. 7.


decemmaculata. 5. B. sulphurea, elytris tridentatis atriis: maculis quinque luteis, pedibus violaceis. Plate
PLATE XXIII. FIG. 3.


Long. corp. lin. 5\frac{4}{5}.


cupriceps. 7. B. viridi-aurata, elytris serratis punctato-striatis, capite cupreo, ano bispinoso.

Long. corp. lin. 5\frac{1}{2}.

fissiceps. 8. B. ænea, elytris integerrimis sericeis substriatis, basi lobatis, capite emarginato.

PLATE XXIII. FIG. 4.

Long. corp. lin. 4.


(Cebrionidæ.)

Rhipiceræ Latr.

femorata. 9. R. atra, thorace elytrisque punctis albis irroratis, femoribus rufis.

Long. corp. lin. 8.

Habitat in Australasiae insulis dictis Kent's Islands in freto dicto Bass's Straits.


*Scarabæidae.*

*Scarlæus* Latr.


*Bolboceras* Kirby.

*Labrum* transversum.

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Maxillae apice bilobae: lobis ciliatis; interiori minuto, exteriori subcuneiformi: angulo apicis intus producto acutissimo. Palpi filiformes.
Mentum subquadratum, integrum.
Antenne undecim-articulatae: articulo primo subclavato extus minutissimo, secundo cylindrico, proximis sex transversis, ultimis tribus clavam maximam compressam suborbiculatam, pilosam, articulo intermedio sæpius penitus tecto et abdito, formantibus.

**Geotrupes** Latr.

Labrum transversum, integrum.
Labium bifidum: lobis rotundatis.
Mandibulae cornae, arcuatae, edentulae, acutae, supra concavae.
Maxillae lobo exteriori trigono, apice scopigero: scopa densa, rigida, trigona.
Palpi filiformes.
Mentum suborbiculatum, apice profunde emarginatum.
Antenne undecim-articulatae: articulo primo incrassato clavato piloso, secundo brevissimo sequentibus crassiori obconico, sex proximis magnitudine sensim crescentibus, ultimis tribus clavam subovatam obscuram papillosam, intermedio semper aperto, formantibus.

These two sets of characters are designed to point out the differences between two distinct families of Scarabeidae that have hitherto been considered as belonging to the same genus. Sc. mobilicornis Linn. (of which Sc. testaceus Fabr. is only a variety), quadridentes Linn., farctus Fabr., Lazarus Fabr., Cyclops Oliv. &c., belong to one of these families; and Sc. Typhaeus Linn., dispar Fabr., Momus Fabr., stercorarius Linn., foveatus Marsh., Mutator Marsh., splendidus Fabr., sylvaticus Fabr., hemisphericus Oliv., and vernalis
Whoever considers these characters, and compares these sets of insects with each other, will be immediately convinced that, according to the modern system, they ought to constitute different genera. The mandibula of one side (in some the right-hand one and in others the left) bidentate at the apex; maxillae with the outer lobe truncated at the apex, the inner angle acuminate, and narrowest at the base, and ciliated; the quadrate entire mentum; and above all the compressed, orbiculate, shining, punctate, hairy clava of their antennae, the exterior lamellæ of which usually inclose the intermediate one as entirely as the valves of a bivalve shell the animal which inhabits it, distinguish the former of these tribes, to which I have long given the generic name of *Bolboceras*; whereas the other, the true *Geotrupes*, or earth-borer, is remarkable for mandibulae without teeth; maxillæ with a prismatic exterior lobe terminating in a brush of stiff dense hairs; an orbicular deeply-emarginate mentum; labium with rounded lobes; and antennæ with a subovate clava, the third joint of which is always apparent, and all its joints exhibiting a downy appearance, but having no hairs. The body of the former also is more hemispherical than that of the latter, and the clypeus is not rhomboidal.

*Geotrupes vernalis* seems to connect these two genera; its body approaching to an hemispherical form; its labrum, though not emarginate, terminating in a concave line; and its mandibulae having two teeth at the end. It differs from both in having the interior tooth the shortest, and the exterior edge of the mandible sinuate. In most other respects it agrees with *G. stercorarius*, &c. In *Bolboceras Cephus* the middle joint of the clava of the antennæ is not so wholly shut up between the two exterior ones as to be entirely hidden by them. In other respects it agrees with the rest. My details of *Bolboceras* were taken from *B. quadridens*, and
and those of Geotrupes from G. stercorarius. I shall now describe a new species of the former genus from Mr. Brown's collection.

**Australasia.** 11. B. testaceus, thorace punctatissimo antice retuso, clypeo obtuse carinato.

**Plate XXIII. Fig. 5.**

Long. corp. lin. 9.


**Trox Fabr.**

spurius. 12. T. oblongus, scaber, subcinereus, elytris seriatim papillatis.

Long. corp. lin. 5.

**Intermedius** inter Trogem et Melolontham, et forsan proprii generis. **Corpus** oblongum, nigrum, glabrum, obscurum, punctis papillatis et centro oblongo eminentibus pallidis subcinereum et scabrum. **Caput** suborbiculatum, deflexum, inaequale: clypeo
peo reflexo antice subemarginato. *Os concursu labri et menti
omnino clausum: labio, mandibulis maxillis palpisque labiali-
bus penitus tectis. *Palpi maxillares articulo extimo præcedenti-
bus majori, subarcuato, basi tenuiori. *Mentum magnum, eleva-
tum, dorso depressum, triangulari-cordatum. *Antennæ novem-
articulatæ: articulo primo subglabro longiori, secundoque bre-
vi, clavatis, apice incrassatis; tertio graciliiori, clavato; quarto
brevissimo, subcylindrico; quinto et sexto subpateræformibus,
transversis; clava lamellis tribus lanceolatis acutis. *Thorax
transversus, antice emarginatus, postice obsolete obtusangulus,
lateribus rotundatis, dorso utrinque tri-impressus. *Elytra punc-
tis papillatis seriatisim ordinatis, seriibus plurimis. *Tibiae anticae
obtuse tridentatae.

Not being able to come at the trophi (*Instrumenta cibaria Fabr.)
of this insect, I cannot clearly ascertain whether it belongs to
*Trox or *Melolontha. Its habit, stature, and closed mouth are
nearly those of the former genus; but the first joint of the an-
tennæ is not hairy as in that, its abdomen not vaulted and flat,
and the anterior pair of tibiae are not without teeth.

**Melolontha Fabr.**

*sericea.* 13. M. viridis, supra sericea subtus piloso-incana, pedi-
bus rufis, clypeo elongato emarginato.

Long. corp. lin. 5½.
Affinis *M. aulicolae* Fabr. et *M. aurulentæ* Kirby, sed distincta. *Corpus* oblongum, viride, sericeo-nitidum, subtus ex pilis albis
decumbentibus incanum. *Caput* inclinatum, ex punctis con-
fertis impressis quasi reticulatum. *Clypeus* elongatus, antice
profunde emarginatus: margine omni reflexo. *Palpi maxill-
lares* niveo-pilosi. *Maxillæ* basi apertæ, magnæ. *Mentum* ob-
triangular. *Antennæ* pallide rufæ, decemarticulatae: articulo
secundo
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Cetonia Fabr.


Habitat in Australasia. Apud Port Jackson a D. Brown in Mimosa lecta.


Var. β. elytris punctis octo atris. D. MacLeay.

Brownii.
Brownii. 15. C. castanea, capite, thoracis disco, scutello, pectorisque nigris, clypeo elongato bifido.

Plate XXIII. Fig. 6.

Habitat in Australasia, apud Port Jackson.


Brunnipes. 16. C. supra viridis, thoracis lateribus, punctisque du-obus dorsalibus elytrorumque plurimis, albis, pedibus bruneis.

Mr. Kirby's Description of several new Species of Insects


COLEOPTERA HETEROMERA.

(Tenebrioniidae.)

ADELIUM Kirby.

caraboides. 17. A. nigrum, thorace postice utrinque angulato, elytris porcatis: porcis alternis catenulatis.

PLATE XXIII. FIG. 7.

Carabus porcatus apterus, ater, elytris striatis apice granulatis. Fab. Ent. Syst. Em. i. 147. 101.

Calosoma porculatum. Fab. Syst. Eleuth. i. 211. 3.

Long. corp. lin. 74.

Facies omnino Carabi sed hujus generis. Corpus subdepressum, nitidum, glabrum, nigrum. Caput subtriangulare, ex punctis excavatis confluentibus postice rugosum, antice inter antennas transverse elevatum. Antennae fere filiformes, thorace longiores. Thorax planiusculus, transversus, ex punctis impressis confluentibus valde rugosus, antice emarginatus, postice transversus: angulis lateralibus extantibus, subrecurvis, utrinque marginatus:

Obs. Porci omnes in apice elytri interrupti sunt.

I did not discover that Adelium caraboides had been described by Fabricius till after the figures illustrative of this paper were drawn; and as the insect here given confirms the genus I had laid down in my former paper, and is another instance of its species imitating the form and appearance of the Carabidae, I think it may be interesting to Entomologists, particularly on account of Mr. Curtis's excellent figure, if I retain it. I have altered Fabricius's trivial name, as the insect certainly is neither a Carabus nor a Calosoma, to make it harmonize with those of the species before described.

**Helœus** Latreille.

* Thorace antice bipartito, ante caput protenso.

**Brownii.** 18. H. ater, glaberrimus, thorace caput ambiente, coleoptris disco elevato granulato: sutura carinata.

**Plate XXIII. Fig. 8.**

Long. corp. lin. 9.


This family of the genus *Helœus* presents some of the most singular insects in nature. The lobes of the thorax meet over the head,
head, and by their union, by means of a sinus cut out of their inner side, form a round hole where the vertex of the head appears and part of the eyes, so that the animal is thus enabled to see things above it as well as below it. The anterior part of the head is below the thorax.

** Thorace haud caput ambiente.


Long corp. lin. 6½.


**COLEOPTERA TETRAMERA.**

*(Curculionidæ.)*

**EURHINUS** Kirby.


Long. corp. (Rostro excluso) lin. 8.

*Corpus* obcuneiforme, plus minus piloso-incanum. *Caput* rugulosum, postice læve, inter oculos canaliculatum. *Rostrum* thoracis
collected in New Holland by Mr. Robert Brown.


**Curculio Linn.**

*mirabilis.* 21. *C. fuscus,* rostro brevissimo, thorace confertim elytrisque seriatim nodulosus, ventre masculo postice aperto.

**Plate XXIII. Fig. 9.**

Long. corp. (Rostro excluso) lin. 10.

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sed revera deflexa est horum segmentorum pars media. Ex fundo cavatatis laminæ duæ, latæ, compressæ, obcuneatae, apice rotundatae, lævissimæ, glaberrimæ, nitidæ emergunt, et postice utrinque in margine ipso circuli setarum rigidissimaram fasciculi, vel potius pectines duo. Basi late excavatus est venter.


I know no insect amongst the Curculionidae (except one of the same tribe with this in Mr. MacLeay's cabinet with an anal forceps, something like that of an earwig,) that is so wonderfully formed as the species here described. The ventral cavity, laminæ, and pecten have no parallel that I am aware of in the insect world. These organs are probably for sexual purposes, since the other sex, if I am not mistaken in supposing the variety I have described merely sexual, is without them.

(Cerambycidæ.)

Stenocorus Fabr.

punctatus. 22. St. piceus, thorace spinoso, elytris excavato-punctatis, pallido nebulosis.


**DISTICHOCERA MacLeay.**

*Labrum* transversum, tetragonum.
*Labium* membranaceum, apice bilobum: lobis divaricatis.
*Mandibula* trigone, edentulae, apice incurvæ, acute.
*Maxilla* basi apertæ.
*Palpi* filiformes.
*Mentum* transversum, trapeziforme.
*Antenna* sensim crassiores, disticho-ramosæ.

This genus, named long ago, as above, by Mr. MacLeay, connects *Cerambyx* with *Molorchus*, *Necydalis*, and *Rhagium*. With the latter indeed it has little other connexion than from the similar shape of its elytra, which grow gradually narrower towards the apex; from *Cerambyx* it is distinguished by its antennæ; and from *Molorchus* and *Necydalis* by its elytra, scarcely at all shorter than the wings, and by its disticho-ramose antennæ.

*maculicollis*. 23.

**PLATE XXIII. FIG. 10.**

*Corpus* fere cuneiforme, subtus pilis argenteis nitidum, supra nigrum, obscurum. *Caput* subcordatum, pilosum, canaliculatum, utrinque ante antenas carinatum. *Oculi* brunnei. *Antenna* breviore, nigrae: articulis omnibus apice biramosis (duobus primis brevissimæ); ramis oppositis compressis vertice rotundatis,
Mr. Kirby’s Description of several new Species of Insects

Mr. Kirby’s Description of several new Species of Insects


Molorchus Fabr.


(Lepturidae.)

Leptura Linn.
ceramboides. 25. L. nigra, thorace subspinoso antice constricto, elytris croceis, ore pedibusque rufis.

Plate XXIII. Fig. 11.
Long. corp. lin. 7¼.

A habitu

This species approaches very near to Stencorus suturalis of Olivier (iv. no. 69. 29. 25. t. 3. f. 29.) ; but in his insect the legs are black, the thorax has only two tubereles, and the base of the exterior margin as well as that of the suture is violet; whereas in L. ceramboides the legs are red, the thorax has four tubercles, and only the suture is violet. His insect also comes from a different country, being a native of the East Indies. These two species form a distinct section of Leptura, or perhaps a new genus.

(Chrysomelidae.)

Chrysomela Linn.


Plate XXIII. Fig. 12.

Long. corp. lin. 4.

Corpus oblongum, sanguineum. Caput punctatum. Antennæ extrorsum crassiores, compressæ, nigræ, basi rufæ. Thorax transversus,

Ab insectorum pictori eximio, collectori strenuo, indagatori assiduo, cordato, Do Johanni Curtis Norvicensi, hoc pulchellum insectum nomen mutuatur.

HEMIPTERA.
(Cimicidæ.)

Scutellera Lam.

Dux. 27. S. viridis, supra cyanea, scutello basi macula biloba, abdomine, lateribus, femoribusque, aurantiacis.


(Cicadiade.)

Achilus Kirby.

Frons tricarinata.

Labrum vix distinctum, cum clypeo in medio coalitum.

The situation of the antennæ of the insect from which I have formed this genus, agrees with that of Fulgora; but in all the genuine species of the latter their second joint is much larger than the first, globose, and covered with papillæ: whereas in Achilus it is not remarkably larger than the first, is rather tapering, and without papillæ. The labrum also is not separated from the clypeus, except on the sides, by any suture or even impressed line; the thorax a good deal resembles that of Fulgora, but it is more completely obtusangular.

flammeus. 28. A.

PLATE XXIII. FIG. 13.


* By this term we designate an anus terminated by a process resembling a floret. Ex. Fulgora candelaria.
HYMENOPTERA.
(Sphegidae.)

Thynnus Fabr.

annulatus. 29. T. fulvescente-villosus, thorace obscure ferrugineo nigro maculoso, abdomen flavo: segmentis utrinque annulo nigro.

Long. corp. lin. 15½.


Corpus fere lineare, mollissime sed vix dense fulvo pubescens. Caput flavum: vertice macula magna angulata nigra. Antennae thoracis fere longitudine, setaceae, nigrae. Truncus subglobosus, supra fulvus: antice fasciis duabus vitta intermedia connexitis,

* I adopt this name from the MSS. of Dr. Leach, who observes that this species varies considerably. He possesses four varieties, and Mr. MacLeay a fifth.

(Apidæ.)

XYLOCOPA Latr.

Australensis. 31. X. cyanea, supra viridis, alis violaceis, capite anoque viloso-albis.

Long. corp. lin. 8.


(Formicidae.)

FORMICA Linn.

intrepida. 32. F. nigra, trunco pedibusque rufis, capite abdo-mine majori.

Long corp. lin. 7.

Habitat in Australasia, apud Port Jackson. Formicarum audacissima, strenuissima.

Affinis F. rufa, L. Corpus glabriusculum, nigrum. Caput triangulare, postice subemarginatum, supra sparse punctatum, et in-
Mr. Kirby's Description of several new Species of Insects.


**viridis.** 33. *F. glauco-viridis*: antennis oreque rufis, abdomine segmentis margine albis.

Long. corp. lin.

*Habitat* in Australasia septentrionali.


This is the ant the bite of which Sir Joseph Banks found so painful*.

EXPLANATION OF PLATES XXI. XXII. XXIII.

PLATE XXI.

Fig. 1. 
Pelecium cyanipes.

2. Anelastes Drurii.

3. Rhipicera marginata.
aa. Mandibulæ. bb. Ditto of Rh. femoralis.

4. Lampyris Latreillii.
a. Antenna of female.

5. Eurypus rubens.

6. Axina analis.

7. Priocera variegata.

8. Geniates barbatus.


10. Rutela pulchella.
Explanation of Plates

Fig. 11. *Cetonia MacLeayi.*
12. *Lucanus nebulosus.*
15. *Spharotus curvipes.*
16. *Strongylium chalconatum.*

**Plate XXII.**

Fig. 1. *Eurynotus muricatus.*
2. *Adelium calosomoides.*
3. *Oxura setosa.*

Fig.
Fig. 4. *Spheniscus erotyloides.*

5. *Stenochia rufipes.*


8. *Eurhinus levor.*
   e. Antenna ♂.  f. Antenna ♀ of another species.


    a. Head (front view).

11. *Curculio Hancocki.*
    a. Apex of Mandibula.

12. *Curculio elegans.*


15. *Lamprosoma bicolor.*

Explanation of Plates.

PLATE XXIII.

Fig. 1. Buprestis cruentata.
2. —— pæorhea.
3. —— 10-maculata.
4. —— fissiceps.
5. Bolboceras Australasie.
   f. Antenna.
6. Cetonia Brownii.
7. Adelium caraboides.
8. Hel•us Brownii.
9. Curculio mirabilis.
10. Distichocera maculicollis.
   a. Labium.  b. Antenna.
11. Leptura ceramboides.
12. Chrysomela Curtisii.

* c d e are from Bolboceras quadridens.
XXIX. Some Account of the Island of Tristan da Cunha and of its Natural Productions. By Captain Dugald Carmichael, F.L.S.

Read December 16, 1817.

The British Government having judged it expedient to take possession of the island of Tristan da Cunha, a military detachment, consisting of about fifty men, with a captain, two subalterns, and a medical officer, was sent to occupy it from the Cape of Good Hope. Motives of curiosity led me to apply for permission to accompany this expedition, which embarked on board His Majesty's ship Falmouth on the 2d of November 1816. A liberal supply of agricultural instruments, with a team of labouring oxen, and some cattle for breeding, was sent on board at the same time. We sailed from Table Bay on the 3d, and two days after encountered a heavy gale, during which, our cattle, standing unsheltered upon deck, were so much injured by the rolling of the ship, and by the sea washing over them, that they all died before we arrived at our destination. The westerly winds, which usually prevail in the high southern latitudes, protracted our voyage to the 28th of November: but we had the good fortune to come to anchor in fine weather, and landed all the stores without loss or damage.

Tristan da Cunha is situated in 37° 6' south lat. and in 11° 44' west long. The whole island is apparently a solid mass of rock in the form...
of a truncated cone, rising abruptly from the sea, and ascending at an angle of 45 degrees to the height of three thousand feet. This mass is surmounted by a dome upwards of five thousand feet high, on the summit of which is the crater of an old extinguished volcano.

The island is of a circular form, and about nine leagues in circumference. In various places the sea beats home against the salient angles of the mountain, rendering it impossible to walk round the island. Between those points a narrow beach has been formed, by the gradual accumulation of the fragments of rock daily precipitated from above; and is covered in some few places with a layer of fine black sand resembling gunpowder, which is, however, kept in constant motion, being washed away by one gale, and cast up again by the next.

The face of the mountain, as far up as the base of the dome, is mostly covered with brush-wood, intermixed with fern and long grass, which veil its native ruggedness. In many parts, however, it is completely bare, and presents to view the edges of a vast number of strata arranged horizontally, or at slight degrees of inclination. These strata are in general from five to ten feet in thickness, and vary essentially in their internal structure. The greater number are of solid rock, of a blueish-gray colour and extreme hardness, in some instances homogeneous, in others exhibiting crystals of hornblende, felspar, and olivin sparingly scattered, or forming more than a moiety of the compound mass. Between those are frequently interposed beds of scoria cohering from the effect of partial fusion; of tufa studded with crystals of augite; or of ashes condensed by the pressure of the superincumbent mass. The latter, still retaining in a great measure their friable nature, moulder gradually away, and leave the more compact strata in projecting shelves.
The mountain appears to have been rent asunder by some violent convulsion, and the fissures filled up by a hard stony mass of a blueish or a reddish colour, and of the nature of trap, forming regular veins, the ramifications of which can be traced by the eye to a great height in the face of the rock. The sides of these veins, where they come in contact with the rock, are invariably in a semivitrified state, and exhibit obscure marks of crystallization.

Along the north-west side of the island there runs a belt of low land about six miles long, varying from a quarter of a mile to a mile in breadth, and presenting to the sea a perpendicular front from fifty to three hundred feet in height. The whole of this plain is a confused assemblage of stony fragments, scoria, and other volcanic products, resting on a bed of lava. All these matters are in a progressive state of disintegration, and the greater part of them reduced to mere nuclei imbedded in their constituent elements in the state of a black indurated earth.

The northern extremity of the plain is in a great measure cleared of its wood. By setting fire to the grass the trees have been so far scorched as to destroy their vegetation; but they still lie strewn along the ground, and it will cost some labour to remove them. The rest is still in a state of nature, covered with an impenetrable copse.

The surface of the plain, though apparently smooth and even while clothed with its native herbage, is in fact extremely irregular, being everywhere broken by small ridges of loose stones concealed under a mere scurf of soil. Between those ridges, however, the soil is pretty deep, and consists for the most part of the remains of decayed vegetables, with here and there a substratum of alluvial earth approaching to the nature of clay. It is soft, spongy, retentive of moisture, and possesses most of the characters of peat. This soil has been found admirably adapted for the
production of culinary vegetables, but is far too light to support the weight of trees or large shrubs.

This plain is the only part of the island that is in the least susceptible of cultivation; and serious obstacles oppose the conversion even of this to the purposes of agriculture. With the exception of the few spots already mentioned, where the earth washed down by the rain has accumulated, the whole of the ground, before it will be fit to receive the plough, must undergo a regular trenching in order to remove the loose stones, and to loosen the hard earth which lies immediately underneath the surface, and incorporate it with the vegetable mould. After this preliminary operation, there can be no doubt that the soil will yield a fair return in all sorts of European grain.

The ascent to the peak is practicable in sundry places; but the undertaking is attended with serious difficulties, and not free from danger. I went up on the 4th of January, accompanied by Dr. Evers, a couple of servants, and a guide, who had been up some days before. We experienced some obstruction at the outset in making our way through the long grass (Spartina arundinacea) which grows along the lower part of the mountain in close entangled tufts. As we advanced, our progress was retarded by the extreme steepness of the ascent, and the loose incohesive nature of the rocks, which we could hardly venture to touch, lest these fragments should fall upon our heads; nor did we run less risk in availing ourselves of the branches of the arborescent Physlica to support our weight; for the greater proportion of these being rotten, it was necessary for us to choose with caution, as a mistake might prove fatal. After a laborious effort of three hours, however, we gained the table land, and there discovered to our mortification, that the upper region of the mountain was completely obscured. Urged by a strong west wind, the cloud broke from
from time to time against the sides of the dome, and gave us a
transient glimpse of the peak at a height and distance that were
by no means encouraging. After resting, however, for a few mi-
nutes, we proceeded across the base of the dome, trusting that the
cloud would be dissipated by the meridian sun; nor were we in
this respect altogether disappointed. In the mean time, we found
the ground as we advanced a perfect swamp, studded with tufts
of small rushy plants, that gave way under the slightest pressure.
Here also we had to pass through extensive patches of fern (Lo-
maria robusta), the stems of which, like junks of old cable, trail
along the ground, and cross and recross each other in such an in-
tricate manner, that it required all our circumspection to avoid
stumbling over them. Further on, the ground becomes more
firm, but is perforated in all directions by the various species of
Petrel, which resort in myriads to the island during the season of
incubation, and burrow in the earth. The weaker tribes of these
birds are devoured in vast numbers by the Skua gulls, which
pounce upon them as they come out of their holes in the evening,
and leave nothing but the bones and feathers to attest the havock
made among them.

The surface of the dome is furrowed on every side with ravines,
which take their rise among the scoria of the peak, deepen as
they descend, and open in tremendous chasms on the edge of the
precipice. The various portions of the surface thus cut off in a
great measure from all mutual communication, grow narrower
and narrower as you approach the base of the peak, and dwindle
at last into bare ridges of scoria, so sharp and so steep, that the
wild goats of the mountain dare hardly venture to thread them.
That ridge in particular over which we must either have passed
or returned without accomplishing our object, is for at least fifty
yards not more than twelve inches in diameter. The wind blow-
ing in violent gusts at the time, rendered it the more difficult to
maintain that strict equilibrium of body, the slightest bias from
which, either to one side or the other, would precipitate any of us
in an instant to the depth of several hundred feet. We got safely
over it, however, though with some trepidation, and in a manner
as various, I believe, as the number of our party would admit of.

A short way beyond this ridge vegetation ceases; not so much,
however, owing to the elevation of the ground, as to the total
want of any kind of soil wherein plants could fix their roots.
From this point to the summit, a distance of about a mile and a
half, the whole is a mass of scoria, fragments of cellular lava, and
all sorts of volcanic refuse, constantly slipping under your feet, and
rendering the toil of ascending excessive. For nearly a mile we
walked along a ridge of blue lava, which seems to have been at
one time covered over, but afterwards left exposed by the gradual
recession of the loose matters which covered it. In grain and col-
our it resembles the veins which intersect the island mass; but
is disposed on the slightest stroke to break into small amorphous
fragments.

The crater is nearly a mile in circumference: its border is irre-
gular, the south side being two or three hundred feet higher than
the north, by which we ascended. At the bottom of it there is a
pool of water about 150 yards in diameter, to which the descent
by the north side is gradual and easy. Its depth appears to be
inconsiderable, as we could discover the bottom more than half
way across; and its border is covered with rounded fragments of
cellular lava, which float about at the humour of the breeze.
The water is pure, and untainted with any mineral solution.
From the peak we could see the distant ocean on all sides over
the cloud which still shrowded the lower part of the dome; but
no part of the low land can be seen at any time, being covered by
the
the projection of the table land. I found several mosses on the
summit of the peak and some lichens, among others the \textit{L. pas-
chalis}. There was also a large patch of snow a considerable way
down its side, and another within the crater.
Besides the principal crater, which terminates the peak, there
are several others scattered over the declivity of the dome, which
must have rested for ages quiescent, as they are now covered
with verdure. Two of these are situated near the edge of the
table land, looking down on the landing-place.
As we walked down the mountain on our return, we passed
among flocks of albatrosses engaged in the process of incubation,
or tending their young. There are four species of them that
breed on the island, none of which hatches more than one egg at a
time; the \textit{Diomedea spadicea, exulans, chlororhynchos,} and \textit{fuliginosa}: the
two former give themselves no trouble in constructing their
nest, merely choosing a dry spot of ground, and giving it a slight
concavity to prevent the egg from rolling out of its place. The
egg is white, very large, and of a peculiar shape, being uncom-
monly long in proportion to its diameter, and equally thick, or
nearly so, at both ends.
The black albatrosses (\textit{D. fuliginosa}) are at this season gregari-
ous, building their nests close to each other. In the area of half an
acre I reckoned upwards of a hundred. They are constructed of
mud, raised five or six inches, and slightly depressed at the top. At
the time we passed, the young birds were more than half grown,
and covered with a whitish down. There was something extremely
grotesque in the appearance of these birds standing on their re-
spective hillocks motionless like so many statues, until we ap-
proached close to them, when they set up the strangest clattering
with their beaks, and, if we touched them, squirted on us a de-
luge of foetid oily fluid from the stomach.

The
The *D. chlororynchos* builds its solitary nest in some sheltered corner, selecting in particular the small drains that draw the water off the land into the ravines. There it runs up its nest to the height of ten or twelve inches, of a cylindrical form, with a small ditch round the base. A curious circumstance with regard to this bird is, that when irritated the feathers of its cheeks are separated, so as to display a beautiful stripe of naked orange skin, running from the corners of the mouth towards the back of the head.

All of these birds nourish their young by disgorging the contents of their stomach. They are never observed to carry any article of food in their bill: those matters, indeed, from which they derive the chief part of their sustenance, the blubber of dead whales, seals, and sea-lions, would melt away if carried in the bill to any distance. We could not help admiring the utter unconsciousness of danger displayed by them on our approach: they never showed the least disposition to move out of our way: even when kicked or pulled off their nests, they made not the smallest show of resistance; but quietly returned to their post, or stood still until we passed on. Their plumage is in the finest order, copious, and without the slightest stain. They find great difficulty in getting on wing, and must run twenty or thirty yards along the ground with expanded wings before they can get fairly under way. We had the curiosity to take one of them by the point of the wings and fling it over the rock; yet, though it had several hundred feet of a clear fall, it never recovered itself, but dropped down like a stone. On this account, when not engaged with their young, they usually rest upon the edge of the precipice, from which they can launch at once into the air; and on entering again upon that difficult part of our route, we had to kick upwards of a dozen of them to the right and left of us before we could get on.
We arrived at the cantonment about sun-set, after a most fatiguing journey of fourteen hours.

In viewing the general structure of the island, and comparing its diminutive size with the great number of spiracles crowning its summit, and which must all have been at one time or another in a state of activity, there can remain little doubt that the whole of it is of igneous origin. The solid foundation on which it stands is undoubtedly lava. The platform which forms the plain is also a sheet of lava; and though the face of it at one part breaks into prismatic columns, after the manner of basalt, yet the bed of semivitrified rock on which it rests seems to leave no room for doubt with regard to its origin. An entire hill, seven or eight hundred feet high, near the centre of the plain, is composed of nothing but stratified tufa. The plain is encumbered with large detached masses of porphyritic stone, and with others, inclosing crystals of sulphur or of augite, which seem to have been ejected in their present state from the interior of the mountain; and in one instance I met near the base of the mountain, and under one of its strata, with a specimen of the convoluted lava, so common in the Pays-brûlé of the island of Bourbon.

The climate of Tristan da Cunha is so mild, that the herbage remains unimpaired throughout the year. Snow is never seen on the low land; and the only indication of winter is a transient sprinkling of hoar frost, too slight to give any serious check to vegetation. The thermometer during summer rarely ascends beyond 74 degrees in the shade, and stands at about 110° when exposed to the meridian sun. At night it occasionally falls as low as 48 or 50 degrees.

If we may give credit to the information of a man of the name of Currie, who has lived on the island for the last six years, its climate may be regarded as one of the most rainy in the world.
According to his account, the months of January, February and March are the only period throughout the year in which fair weather may be expected with any degree of certainty. During the other nine months the rain, he told us, is almost perpetual. How far the latter part of this statement may be correct, remains still to be proved; but it was our misfortune so far to experience the fallacy of the first, that from the 28th of November, the day on which the detachment landed, to the 30th of March, when I quitted the island, it rained on an average every second day.

This excessive humidity is not however entirely chargeable to the latitude in which the island is situated. Of this we had frequent and tantalizing proofs; for, at the very time that the rain poured heaviest down, we could plainly distinguish from under the skirts of the cloud which hung over us, the distant horizon illuminated by the rays of the sun.

The power which high mountains possess of condensing the moisture of the atmosphere, and precipitating it in the form of rain, is nowhere, indeed, more apparent, or more unremittingly exerted than on this island. The upper region of the mountain is usually involved in a thick cloud, which not only obscures the whole island, but extends its shade to some distance over the surrounding ocean. From this cloud the rain descends in heavy and protracted showers, for the most part on the lower grounds only, but occasionally on the summit also. In the latter case its fall is announced by the sudden appearance of torrents of water pouring in a hundred channels over the edge of the precipice, dashing down from cliff to cliff, and forming a series of cascades the most magnificent, perhaps, on the whole face of the globe.

With such a moist climate, and such frequent rains, it is a circumstance worthy of remark, that the island is but scantily supplied with running water. The only permanent stream of any magnitude
The Island of Tristan da Cunha, &c.

magnitude in the whole island, is one which gushes out at the base of the mountain immediately behind the cantonment. Excepting this brook, you meet with nothing from one end of the plain to the other but the dry beds of mountain torrents, impetuous, indeed, while they flow, but ceasing with the shower to which they owe their existence.

This singular deficiency of springs may, perhaps, be attributed to the nature of the rocky mass of which the island is formed. Though regularly stratified, the rock is cracked and split in all directions, and the rain transmitted through the spongy, absorbent soil, penetrates easily through its fissures, and sinks down at once to the level of the sea, where it may be seen along the shore gushing out through the sand on the reflux of every tide.

Notwithstanding the frequency of the rains, the climate appears to be abundantly healthy. Not a symptom of sickness appeared among the soldiers during the four months I remained on the island.

The spot pitched upon for the cantonment is at the northern extremity of the plain, about half a mile from the landing-place, and within range of cannon-shot from the anchorage. It is plentifully supplied with excellent water from the stream already mentioned, which runs close by it, and which, even during the hottest days of summer, maintains the low temperature of 50 degrees. This stream, after running its course for about half a mile, precipitates itself in a cascade over the face of the rock into a small sandy cove, where boats can easily put in to supply shipping with wood and water.

The prevailing winds off Tristan da Cunha blow from the westward and southward. Strong gales are frequent, but rarely continue above twenty-four hours. They never blow quite home on the island, but incline upwards at some distance from the shore,
and striking against the face of the mountain, are beat back on
the low land in furious whirlwinds.

The sea immediately round the island is fathomable to the
distance of a mile and upwards. The bottom is everywhere
rocky, and covered with a gigantic species of sea-weed (*Fucus py-
rifer*), which, after growing from the depth sometimes of twenty
fathoms or more, stretches along the surface of the water, and
preserves it in some degree smooth and unruffled during even the
highest winds. This is a circumstance of the more importance,
as the coast abounds in a variety of excellent fish, which will prove
a valuable source of subsistence should the island come to be per-
manently inhabited. Among these are several species well known
at the Cape of Good Hope. The Snook (*Scomber serpens*), the
Horse-mackarel (*Scomber Trachurus*), the Roman fish (*Sparus *
), and the Jacobeever (*Scorpaena Capensis*). The best fish,
however, and fortunately the most abundant, is a species of *Cha-
todon* I should think, but which is figured by Forster as a New
Zealand fish, under the name of *Sparus Carponemus*. To the ge-
nus *Sparus* it has certainly no affinity, if the form and disposition
of the teeth are of any weight in the character. This fish usually
grows to the weight of five or six pounds; and is remarkable for
this circumstance, that when pulled up by the hook it discharges
from its vent a great quantity of air, which follows it up in large
bubbles. A large species of *Perea* is sometimes caught in the
deep water. Among the rocks are found an undescribed species
of *Callionymus*, and a most beautiful *Labrus*. I saw one *Exocætus
exiliens* that dropped on board a ship while at anchor, and which
measured eighteen inches in length. The only shell-fish I ob-
served were a *Chiton*, a diminutive *Cardium*, a *Patella*, and two
*Buccinums*. A large crawfish is found in abundance and of a good
quality. The *Sepia octopoda*, and an *Echinus*, with a small land in-
sect
sect belonging to the old genus Cancer. Several species of Covallina are common on the rocks.

Two species of the Seal are the only quadrupeds on the island that can be considered as strictly indigenous, the wild goats and hogs having been introduced subsequently to its discovery by the Europeans.

The Bottle-nosed Seal, or Sea-lion (Phoca Leonina). The colour of this animal is blueish-gray along the back, approaching to white on the belly. It sheds its hair once a year, which falls off in large irregular patches, and gives the animal at that season a most ragged and uncouth appearance. The full-grown male measures from twenty to twenty-five feet in length, and yields seventy gallons of oil. The female is considerably smaller. When irritated it has a curious manner of protruding its snout, and inflating the skin over its nose; but there is nothing like the crest with which the head of this animal is ornamented in Shaw's Zoology. The whole figure is in truth a complete caricature, without the slightest resemblance to the original.

These animals pass the greater part of their time ashore, never quitting it unless when disturbed, or when, urged by hunger, they repair to the reef to feed on the sea-weed. They may be seen in hundreds lying asleep along the sandy beach or concealed among the long Spartina grass which borders the sea-shore. These huge animals are so little apprehensive of danger, that they must be kicked or pelted with stones before they make any effort to move out of one's way. When roused from their slumber they raise the fore part of their body, open wide their mouth, and display a formidable set of tusks, but never attempt to bite. Should this however fail to intimidate their disturbers, they set themselves at length in motion, and make for the water; but still with such deliberation, that on an expedition we once made to the opposite side
side of the island, two of our party were tempted to get astride upon the back of one of them, and rode him fairly into the water.

The Falkland Island Seal (*Phoca Australis*). This species grows to the length of five or six feet. The fur on the back is dark-brown, intermixed with long hairs tipped with white. The throat and breast are cream-coloured, the belly rufous. The vibrissae of the male are white, very long, some of them twelve inches, and hang down over its breast. The fore-feet are placed near the centre of the body, which enables it to sit erect, in an attitude much resembling that of a penguin. Though these animals herd occasionally with the sea-lions, they are much more shy in their nature, and speedily forsake those parts of the island where they are liable to intrusion. They bark like a dog, and are of a bold, ferocious disposition.

The wild hogs secrete themselves in the deepest recesses of the wood, where it is impossible to pursue them. Their ordinary sustenance is from the roots of the wild celery and of the *Pelargonium*: but they occasionally prowl along the sea-shore, and feed on the dead carcasses of seals and sea-lions when they fall in their way.

The wild goats have retreated to the highest ridges of the mountain, where they are equally secure from disturbance. From the very small number, however, that has been seen there, it may be inferred that they have not greatly multiplied.

The only land birds on the island are a species of thrush (*Turdus Guianensis*?), a bunting (*Emberiza Brasiliensis*?), and the common moor-hen (*Fulica Chloropus*). These birds have spread over the whole island, and are found on the table-land as well as on the low ground. The *Fulica* conceals itself in the wood, where it is occasionally run down by the dogs; the others fly about the cantonment, and are so tame as to suffer themselves to be caught with a hand-net. The latter proved extremely destructive to our garden,
garden, nipping off the young plants as soon as they appeared above ground: but their ordinary food are the larvæ of certain species of Phalæna, and the berries of the Empetrum and Nerteria.

Of aquatic birds there is great abundance. I have already mentioned four species of Diomedea. There are six species of Procellaria, among which are the P. gigantea, cinerea, and viitata. The last, and the other three, which are smaller, are night birds, never appearing on wing until after sun-set. They may be caught in any number by kindling a large fire of wood. Attracted by the light, they approach and flutter round it, like so many moths round a candle, till at length the greater number of them, dazzled by the glare, plunge into the flame and perish. The Larus Cataractes is the common tyrant of all the smaller birds, and destroys them in multitudes. There are two species of Sterna, the S. stolida, and one which varies very little from the S. Hirundo. The former builds in the trees, and lays a solitary egg. I never saw the nest of the latter.

The Crested Penguin (Aptenodytes chrysocoma) conceals itself among the long grass, and in the bottoms of the ravines where they open upon the shore. Here they assemble in countless multitudes, and keep up a moaning noise which can be heard at a great distance; and, combined with the roar of the surge re-echoed from the mountain, and the bold inhospitable coast around you, is calculated to excite a train of ideas by no means pleasant. It is owing perhaps to the scantiness of its plumage that the penguin swims heavier than any other bird, no part of it except the head appearing above the water. This gives it undoubtedly a peculiar facility of diving and pursuing its prey under the water. With the same view, perhaps, its eyes appear to be uncommonly sensible to the stimulus of light. In every bird that I had an opportunity of examining the pupil was contracted to a mere dot.

There are no reptiles of any kind on the island: and the only insects
insects I observed are three small species of Curculio; four of Phalæna; one of Hippobosca; two of Musca; one of Tipula; one of Spheroma; and one of Oniscus. The latter has multiplied astonishingly in the soft vegetable soil, and proved a great nuisance to us, creeping up the roofs of our tents, and dropping thence upon our beds during the night. The common window-fly of the Cape was not observed until two months after our arrival; but before I left the island it had begun to be troublesome.

The Flora of Tristan da Cunha is as copious perhaps as the extent and situation of the island would warrant us to expect; but with the exception of the cryptogamous class of plants, it offers nothing that is possessed of any peculiar interest.

The only plant on the island that approaches to the size of a tree is a species of Phylica. This plant occupies not only the whole of the plain, but has also spread over the face of the mountain, wherever its roots could insinuate themselves into the crevices of the rock. In favourable situations it grows to the height of twenty feet and upwards, measuring from twelve to eighteen inches in diameter. Its trunk is extremely crooked and twisted, but the wood is hard, close-grained, and, according to the report of a ship’s carpenter, who examined it, would make excellent timbers for vessels of sixty ton and under. Its bark possesses a slight degree of astringency. Owing to the lightness of the soil, and the frequency of high winds, these trees rarely stand upright, but lean against the ground, and cross each other in such a manner, as to make it a business of extreme difficulty to penetrate to any distance through the wood.

Besides the Phylica there are only two shrubby plants on the island, both of which belong to the genus Empetrum, and may be only varieties of one and the same species. They possess no quality to recommend them, but that they grow on the most barren spots, where no other plant could vegetate.
the Island of Tristan da Cunha, &c.

Of the herbaceous plants, the most remarkable is a gigantic species of *Spartina* (*S. arundinacea*). This grass overruns the whole of the island, from the upper edge of the table-land down to the seashore, accommodating itself to all soils and situations. It springs up in large close tufts which, when full grown, are borne down by their own weight, and lean upon each other in such a manner that a person may roll himself over them without any danger of sinking. Its stems grow to the length of six or seven feet, and are of a solid, almost ligneous, texture, and covered with a profusion of leaves. This grass makes an excellent and durable thatch, and the young leaves are eaten by horses and oxen.

The wild Celery grows in abundance over all the low ground, and attains a great size, its stem sometimes measuring upwards of three inches in diameter. It possesses in a high degree the flavour of the garden celery, and by proper management might be brought to equal it in every respect.

A species of *Chenopodium* (*C. tomentosum*), of a strong balsamic odour, is common around the cantonment. An infusion of the dried leaves of this plant is used as a substitute for tea by the Hottentots sent down in charge of the cattle. The soldiers use for the same purpose the leaves of the *Pelargonium*, which hardly yield to the others in strength of odour.

The low ground is overrun with a species of *Acana* (*A. sarmen- tosa*), a plant of no apparent utility, but an intolerable nuisance to such as have occasion to walk over the ground where it grows. Its fruit is a sort of bur, which on the slightest touch fixes itself on one's clothes, and falling in a hundred pieces, covers him all over with an unseemly crust of prickly seeds, not to be got rid of without infinite labour.
Description of Four Species of Fish found on the Coast of Tristan da Cunha.

1. _Chatodon monodactylus_, subolivaceus dorso transversim nigro fasciato, spinis dorsalisbus 17; ventralibus 6: intima elongata.

**Tab. XXIV.**

Length eighteen inches. Body oval, compressed. Head sharp; front sloping; mouth small, retractile; lips fleshy; jaws equal; teeth subulate, crowded in the fore part of the jaws, diminishing to a single row behind. Eyes large; iris amber-coloured. G. plates scaly; membrane six-rayed. Dorsal fin 17-24, soft part fleshy and scaly at the base. Pectoral fan-shaped, fifteen-rayed; six lower rays simple, the rest bifid; the sixth ray from the bottom twice the length of the others. Ventral 1-5, triangular considerably behind the line of the pectoral fin. Anal fin fleshy, and scaly at the base, 3-12, the second ray very strong. Tail forked. Scales large, smooth. L. line parallel with the back. Colour varying from olive to bronze, with six broad, obscurely-marked black bars across the back, reaching half-way down the sides. Fins blackish; pectoral amber-coloured, extremely delicate.

This fish is very common on the coast of Tristan da Cunha, and feeds on the leaves of the _Fucus pyriferus_, such of them especially as are covered with serpulae. It takes the hook freely.

I have called this fish _Chatodon_, as coming nearer to that genus than to any other that I am acquainted with. Among Forster’s drawings in the collection of Sir Joseph Banks, a figure of it is given under the name of _Sparus Carponemus_; but the form and disposition of the teeth exclude it from that genus. The specific name was suggested by the uncommon form and length of the fifth
fifth pectoral ray. I have in my possession the figure of another fish from the Cape of Good Hope, nearly akin to this, with the four lowest rays of the pectoral fin lengthened.

2. *Perca antarctica*, nigro-cœerulea subtus argentea, spinis dorsalis novem: 8 abbreviatis fossula reconditis; ventrali unica.

**Tab. XXV.**


This fish was caught by one of the officers of the Falmouth, while the ship lay at anchor off Tristan. We never took any afterwards. Flesh not remarkably good.


**Tab. XXVI.**

Length seven inches. Body round, tapering from the head. Belly flat. Front depressed. Mouth large, armed with numerous small teeth. Palate rough. Jaws equal. Eyes approximated; iris brown. G. covers marked with tortuous streaks, terminating in two strong, subulate spines, that stand upright when the gills are expanded. G. membrane seven-rayed. First dorsal
sal fin eight-rayed. Second twenty-rayed. Pectoral fins rounded, fifteen-rayed; five lowest rays simple, curved; the rest divided. Ventral fins distant, five-rayed. Anal fin sixteen-rayed. Tail convex. L. line raised, parallel with the back. Scales none. Colour olive, marbled with green blotches and white dots. Skin mucous. This fish is very common among the rocks, and takes the bait greedily. Flesh delicate.


**Tab. XXVII.**


A very rare fish. Caught off the rocks.

---

*Flora of Tristan da Cunha.*

1. *Acena sarmentosa*, diandra hermaphroditica, aristis quatuor, capitulis globosis, foliolis argutè serrato-incisis: supra glabris venosis; subtus sericeis, stipulis indivisis. Ancistrum sarmentosum. *Aubert du Petit Thouars Flora de Tristan d'Acuña*, p. 44. *in* Melanges de Botanique. This
This plant grows all over the low ground; never, however, taking root as is implied in the specific name. The extremities of the branches are ascending.

2. Isolepis sulcata, capitulo laterali globoso polystachio, spiculis ovatis, squamis latè ovatis nervosis margine scariosis apice calloso.

Scirpus sulcatus. Aubert op. cit. p. 36.


It grows on the plain in large tufts.

3. Isolepis bicolor, culmis angulato-filiformibus, foliis canalicularis angustissimis, capitulo terminali, spiculis (5—7) ovatis teretibus, squamis margine coloratis, involucro sub-diphylo: foliolo altero erecto capitulum superante; altero deflexo spiculam vix æquante.

This plant grows in moist situations, both on the low ground and the table-land. It collects in tufts, rising from a spongy base resembling a rotten stalk.

4. Isolepis squarrosa, culmis angulato-filiformibus indivisis basi foliatis, foliis canalicularis angustissimis, capitulo terminali globoso, spiculis (12—20) ovatis, squamis margine concoloribus, involucro diphylo: breviore deflexo.

5. Isolepis prolifer, culmis angulatis ramosissimis, foliis fasciculatis, capitulis passim proliferis, spiculis oblongis teretiusculis, involucro diphylo.

Scirpus prolifer. Aubert op. cit. p. 36.

Grows on the plain.

6. Spar-
6. **Spartina arundinacea**, spica communi teretiuscula; partialibus arce imbricatis, valvula minore glumæ externa oblique truncatam perianthii superante.

Ponceletia arundinacea. *Aubert op. cit.* p. 36.


7. **Polygono internus**, panicula coarctata lobata, glumis subulatis pubescentibus, seta perianthii terminali valvula quadridentata breviore.

Phalaris mollis. *Aubert op. cit.* p. 37?

Culmi plurimi, 1—2-pedales, fasciculati, adscendentes. Folia linearia glabra, vaginis glabris, suprema ventricosa. Panicula vix omnino exserta, nutans.

This grass grows in spreading tufts, chiefly confined to the clear ground. It is greedily devoured by cattle.


Both these species of *Agrostis* are found on the high part of the mountain, forming the chief part of its herbage: a few
the Island of Tristan da Cunha, &c.

few straggling tufts are met with on the low ground, along the bottom of the ravines, where the seeds have been washed down by the torrents.

Erythrodanum alsineforme. *Aubert op. cit.* p. 42. tab. 10.  
Grows in the plain in the most barren spots.

11. **Nerteria assurgens.** *Aubert l. c.*  
Erythrodanum majus. *Aubert op. cit.* p. 42. tab. 11.  
Flowers pale yellow, very small. Berry scarlet, the size of a pepper-corn. It grows on the plain.

12. **Convolvulus Soldanella.** *Linn.?*  
This plant is found on the south-east side of the island, growing in the sand close to the shore, and confined to a single spot. It appears to be of recent introduction, having in all likelihood been wafted to this shore by the currents.

13. **Phyllica arborea,** foliis sparsis ovato-lanceolatis aveniis subtus tomentosis, capitulis axillaribus lanatis.  
Phyllica arborea. *Aubert op. cit.* p. 45.  
Truncus arboreus, cortice cinereo. Ramuli albo-tomentosi.  

14. **Chenopodium tomentosum.** *Aubert op. cit.* p. 38.  
Common on the plain.

15. **Hy-**
15. *Hydrocotyle capitata*, hispida, foliis reniformibus obsolete lobatis crenatis, capitulis subsessilibus, bracteis pedicellos superantibus.  

*Hydrocotyle capitata*. *Aubert op. cit.* p. 43. tab. 12.  


A common weed on the plain, creeping among the grass. It has a strong taste and odour of the carrot-leaf.


*Apium australe*. *Aubert op. cit.* p. 43.


Caules fasciculati, sesquipedales, adscendentes, sulcati. Folia glabra, retusa. Flores glomerati, hermaphroditos-masculi femineis intermixti.

18. *Ranunculus?*  

I found this plant growing in a ravine on the table-land; and, there being no flower, judge of its genus merely from the form of the leaves and their extreme acrimony to the taste.  

19. *Car-*

Proxima C. antiscorbuticae.

Grows in the ravines on the side of the dome.

20. **Pelargonium acugnaticum**, umbellis subcapitatis multifloris, calycibus pilosis acuminatis, nectario dimidiam pedicelli subæquante, foliis reniformibus obsolete lobatis dentato-crenatis glabris.

Pelargonium acugnaticum. *Aubert op. cit.* p. 44. tab. 13.


It grows abundantly all over the lower parts of the island, and diffuses the strong odour common to the genus.

21. **Sonchus oleraceus.** Linn.

Common on the plain.

22. **Gnaphalium pyramidalis.** *Aubert op. cit.* p. 40.

Abundant on the cleared ground.


Grows on the most barren spots on the plain.


Calendula pusilla. *Aubert op. cit.* p. 40. tab. 9.

Grows on the dome: apparently rare.
Capt. Carmichael's Description of


Uncinia brevicaulis. *Aubert op. cit.* p. 35. tab. 6.

Uncinia gracilis. *Aubert op. cit.* p. 35. tab. 5?

Grows in the thickest part of the wood. The culm greatly elongated after the period of flowering.


Carex spicis confertis sessilibus hermaphroditis. *Aubert op. cit.* p. 36.

27. **Carex Insularis**, spicis masculis pluribus, femineis pedunculatis distantibus: inferioribus pendulis, squamis aristatis, fructibus ovatis bidentatis.

Carex spicis pluribus masculis, femineis pedunculatis. *Aubert op. cit.* p. 36.

Both this and the preceding grow on the plain.

28. **Empetrum Medium**, floribus (plerisque) hermaphroditis, baccis 7—9-spermis, ramulis foliorumque marginibus spurii (angulis reduplicationis) lanatis.


29. **Atriplex Plebeja**, caule herbaceo erecto, foliis rhombo-hastatis dentatis obtusis; superioribus hastatis lanceolatis-que edentulis.

This plant grows along the shore, and seems to be almost a stranger on the island.
the Island of Tristan da Cunha, &c.


This elegant plant grows indiscriminately on the dome, the face of the table-land, and the plain. It extends to the length of several fathoms, decaying from the base in proportion as it advances, and drawing sustenance by the radicles which it pushes from time to time into the soil. It is entirely clothed with leaves ending in a white filament, which gives it in its fresh state a silky feel. The shoots are numerous and irregularly subdivided. The spikes sessile, cylindrical, two inches long, simple, bifid, or in pairs, equal in thickness to the shoot, and of a yellowish colour. The floral leaves are reflected after the dispersion of the seeds.


Grows on the side of the dome.

32. **Lycopodium insulare,** capsulis axillaribus, foliis lineari-lanceolatis acutis integris confertissimis patulis reflexisve, caule dichotomo.

Grows on the sides of the ravines.

33. **Ophioglossum opacum,** spica caulina, fronde cordata opaca: venis inconspicuis, radice bulbosa.

Grows high up on the dome.


*Acrostichum laurifolium. Aubert op. cit.* p. 31.

In the wood.

2 u 2

35. **Acros-**
35. **Acrostichum succisæfolium**, fronde simplice oblonga coriacea utrinque squamosa: squamis peltatis lanceolatis ciliatis.

*Acrostichum succisæfolium.* *Aubert op. cit.* p. 31.

In the wood.


*Acrostichum ciliare.* *Aubert op. cit.* p. 32?

Fronds 6—12 inches long; fertile ones smaller margined.

Grows on the mouldering banks of the ravines.

37. **Acrostichum obtusatum**, frondibus simplicibus: squamulis subulatis sparsis; sterilibus oblongis; fertilibus ovatis, stipitibus hispidis.

On the highest rocks of the table-land.

38. **Grammitis australis.** *Br. Prodr.* 146.

On the table-land and rocky borders of the ravines.


*Asplenium filipendulæfolium.* *Aubert op. cit.* p. 34. *tab.* 4.

High on the face of the table-land, and on a detached hill in the middle of the plain.

40. **Polypodium aquilinum**, fronde tripinnatifida deltoidea subitus pubescenti, pinnulis falcatis: inferioribus crenato-incisis, stipite pubescente et paleaceo.

*Polypodium aquilinum.* *Aubert op. cit.* p. 32.

Caudex repens, basibus stipitum induratis muricatus. Frons 1—4-pedalis, subquadripinnatifida. Stipes rachis costæ-
que pubescentes, paleisque rufis deciduis adspersae, paleae baseos lineares, confertissimae. Sori submarginales. 

Grows in the wood: very common.

41. **Aspidium Bifidum**, fronde bipinnatifida lanceolata pubescenti, pinnulis integris obtusiusculis: venis indivisis, sori lateralibus seriatis.

Polypodium tomentosum. *Aubert op. cit. p. 32. tab. 3.*

Stem about twelve inches long, beset with the remains of the decayed stipes, forked at the top. Fronds from one to three feet long.

In the wood: common.

42. **Aspidium Coriaceum.** *Willd. Sp. Pl. v. p. 268?*

Polypodium calyptratum. *Aubert op. cit. p. 33.*

Grows on the face of the table-land; appears to be very rare; perhaps a stranger. I met with one plant only.

43. **Aspidium Medium**, fronde bipinnatifida deltoidea glabra, pinnulis pinnatifido-incisis dentatis, involucris lateralibus incisis stipite rachique squamosis.

Stem about six inches, crowned with a circle of fronds from nine to twelve inches long.

Grows on the table-land.

44. **Cheilanthes Viscosa**, fronde tripinnatifida pubescenti, pinnulis inciso-dentatis, stipite rachique hispidis.

Polypodium villoso-viscidum. *Aubert op. cit. p. 33.*

Caudex subterraneus, repens, setosus, stipes erectus teres sulco exaratus fragilis rufus. Frons sensim explicata, 2—3-pedalis. Planta tota setis rigidis erectis glandulosis viscidis obsessa.

It grows in the wood: rather common.

45. As-
In the ravines.

46. Asplenium insulare, frondibus pinnatis submembranaceous, pinnis oblongis duplicato-crenato-incisis basi superiori auriculatis inferiori excisis.
Asplenium marinum. *Aubert op. cit.* p. 34.
In the wood.

Asplenium crassum. *Aubert op. cit.* p. 33.
In the wood.

In the ravines.

49. Lomaria robusta, frondibus pinnatis, pinnis oblongo-linearisibus acutiusculis: sterilibus integerrimis: paginis discoloribus; costa super lanata subter rachique paleaceis, stipitis paleis subulatis elongatis.
This beautiful fern is more generally scattered than most of the others, being found in all moist places from the tableland down to the plain. The trunk grows to the length of four or five feet, sometimes erect, but usually lying on the ground, with its apex only upright. Though not above two inches in diameter, the stumps of the decayed fronds, with their thick scaly covering remaining attached to it, give it an apparent diameter of eight or nine inches. It is crowned with numerous stiff fronds, from one to three feet in length, according to the age and situation of the plant. The barren fronds form a spreading circle, within which, in the summer, five or six fertile fronds shoot up in a perpendicular tuft.

Acrostichum polytrichoides. *Aubert op. cit.* p. 32. tab. 2.

On the most barren parts of the plain.


Grows in the wood: not common.


In the ravines.

53. **Vittaria stricta**, frondibus linearibus acutis strictis, soris intramarginalibus.


Grows in the wood.


On the rocks.

55. **Hymenophyllum æruginosum**, frondibus lanceolatis bipinnatifidis hirsutis, pinnulis bifidis linearibus, stipitibus filiformibus.

*Trichomanes æruginosum*. *Aubert op. cit.* p. 34.

On the rocks.

I have nothing to remark regarding the Mosses and Lichens, not having made any memoranda of them.

XXX. Some
XXX. Some Account of the Spiral Tubes or Ligaments in the Genus Terebratula of Lamarck, as observed in several Species of Fossil Shells. By Mr. James Sowerby, F.L.S.

Read December 6, 1814; and February 7, 1815.

I have the honour of submitting to the Linnean Society a sketch, showing the general construction with the extraordinary spiral and perhaps originally cartilaginous tubes of a certain division of the genus Anomia of Linnaeus, or Terebratula of Lamarck. The Anomia striata of Martyn is represented at Fig. 2. (Tab. XXVIII.), having its triangular aperture between the beaks, which is characteristic of the division. In this species the side of the spiral tube is of a darker colour than the crystallized carbonate of lime which fills the shell, the whole being limestone. It is probable that these peculiar constructions may give characters to new genera, of which many species are found in England, France, Ireland, and even in New Holland, imbedded in limestone, flint, chert, or sandstone. In a specimen brought from New Holland by Mr. Brown, one only of the spiral tubes is to be seen; and it was not known positively that the shell ought to have two, until, a short time since, I discovered in my collection a complete specimen, from which Fig. 1. is taken.
Mr. Sowerby on the Spiral Tubes in the Terebratula. 515

Fig. 1. Terebratula striata, Anomia striata of Martyn*. The lower valve containing the spiral tubes considerably enlarged, the specimen being little more than one inch long.

a. a. Sections of those parts of the spiral tubes by which they are attached to the upper valve.

b. The place of the triangular aperture immediately above the lower beak.

Fig. 2. Terebratula striata. The two valves with one end cut off.

a. The triangular aperture between the beaks.

b. Section of the spiral tube near the end.

I suspect Anomia cuspidata†, Linn. Trans. vol. iv. Pl. 4, with the beak of the perforated valve lengthened and reverse, may have a similar construction within, as well as Anomia subconica of Martyn, tab. 47.

Since I presented to the Society a sketch of an Anomia or Terebratula with a spiral internal cartilage, I have received a species of Terebratula of a very different construction with a spiral cartilage; and I conceive that a figure of this species would be a convenient addition to my former communication, as showing that the spiral cartilage is less confined to shells of a certain external form than might have been expected. Such as I had seen before had straight elongated hinges, and the deeper shell had a triangular foramen, or distant curved beaks indicating it. The present sketch (fig. 3, 4.) represents a shell curved laterally from the hinge, which must be very short, the beaks very small, and without any space for a triangular foramen externally, although within

* Mr. Martyn sent me this specimen some years since. It shows the triangular aperture, although his figure does not; but the shell showed no sign of the tube till I broke it for information.

† Figured, since the reading of this Paper, as Spirifer cuspidata in Mineral Conchoology, tab. 120.
there appears a nearly triangular appendage to the cartilage, which, if not possessed of the outer shell, might indicate a triangular foramen. I presume to lay this sketch before the Linnean Society, hoping that the subject will meet with attention and investigation when opportunity offers. The construction of the shells in my former communication would, without the present specimen, have given an idea of the straight hinge being peculiar to those Terebratula with a spiral cartilage, as agreeing with Parkinson and Martyn, and might therefore have been misleading. The spiral remains in the present species seem rare, as most of the shells are filled with a hard marley earth. It was found with some other species in Sladacre's Quarry, on the right-hand side of the road leading from Wych to Calwell-Green, a part of the Malvern hills. Some specimens had small round joints of Encrini on them.

Tab. XXVIII.

Fig. 3. Terebratula obtusa. The remains of the spiral cartilage and the somewhat triangular appendage; the shell having been worn off.

Fig. 4. The marle cast nearly covered with the shell and two small round joints of an Encrinus, perhaps the new species mentioned by Mr. Horner* as found also at the Malvern hills.

I add also a drawing of a small Terebratula, which might be called T. sinuata, with a straight hinge. It seems plentiful in a marley stratum somewhere. I do not think it is noticed in any work; and I shall be glad to learn its locality.

Fig. 5. T. sinuata, natural size.

Fig. 6. T. sinuata, magnified upper side.

Happening a few days since to take up Ray's *Wisdom of God in the Works of the Creation*, I was particularly struck with the passage where, speaking of the Woodpecker tribe, he says, "Their toes stand two forwards, two backwards; which disposition (as Aldrovandus well notes) Nature, or rather the wisdom of the Creator, hath granted to Woodpeckers, because it is very convenient for the climbing of trees."

The attempt to prove this assertion, adopted by so many and able naturalists, to be altogether unfounded, must appear to savour of presumption in one who has so little of the philosopher about him: nevertheless, I hope to convince you that such disposition of the toes in the Woodpecker tribe was intended by the Author of Nature for a very different, though equally wise purpose. I know of but six genera, viz. *Psittacus, Cuculus, Picus, Ramphastos, Trogan, Bucco*, that are furnished *pedibus scansoriis*, i.e. with two toes before and two behind; and of this number I am acquainted with the manners of the three first only.

To begin with *Cuculus*:—I speak only of our common species: Here is a bird furnished with two toes before and two behind, and yet is actually never known to climb at all; a convincing proof that such conformation does not necessarily bring with it the power of
of climbing; more especially when we consider that the Nut-
hatch (Sitta europaea) and Tree-creeper (Certhia familiaris) have	heir toes placed in the usual manner, and yet run up and
down trees with as much facility as the Woodpeckers. The use
of the pedes scansorii*, then, to the Cuckow (as they evidently, in
this case, conduce not to climbing,) I judge to be this: It is well
known that this bird will oftentimes sit by the half-hour together
on the bough of a tree vociferating its loud and pleasing note; in
doing this it sits remarkably forward, and appears in constant
agitation, continually moving its body up and down with great
elegance: now, as it sits so forward whilst using this exertion, it
would be liable to lose its balance and quit its hold, had it only
one toe behind; whereas, by the contrivance of two, it is enabled
strongly to adhere to the branch.

Psittacus also has the pedes scansorii, and is actually a climbing
genus; yet does not this conformation in my opinion in any man-
ner conduce thereto. To say that Parrots assist themselves with
their beaks in climbing, would not argue the pedes scansorii to be
of no utility. Their real use to this genus seems to be not only
to grasp their food (for the foot of the Parrot serves the purpose
of a hand in that respect), but to enable them to step securely
from one branch to another, and likewise to hang suspended, as
they often do; in which case the two toes before and two behind
certainly give stability to their hold.

With respect to the Pici, rather a clumsy tribe, the very stiff
feathers in the tail are of material service to prop them up in the
act of climbing: not so the pedes scansorii, for the Nuthatch with-
out them runs up trees equally well. Of what use then can these
be to the Woodpecker? I answer, that in boring trees, (in which

* I think a more appropriate term might be adopted for this peculiar conformation;
and for this purpose I take the liberty of suggesting the word comprehensorii.
occupation the bird is often engaged for a considerable length of
time), its weight is thrown backward, and thus the supply of two
toes behind is rendered extremely necessary for its support.

What makes me think the wise Author of Nature had this end
principally in view is, that the Nuthatch, from the want of this
conformation, is, when breaking nuts, under the necessity of sit-
ting with its head downwards. It may be alleged that its flexible
tail compels it to this position; but, as I have before observed,
it runs up trees with equal or greater facility than the Wood-
pecker, notwithstanding that disadvantage.

It would be a curious circumstance, and a conclusive argu-
ment in my favour, should it ever be ascertained that the three-
toed Woodpecker (\textit{Picus tridactylus*}), which has only one toe
behind, bores trees in the attitude assumed by the Nuthatch
when breaking nuts.

I have now brought this letter, which I fear has tired your pa-
tience, to a conclusion; but as it is upon a subject hitherto not
sufficiently examined into, you may possibly think it worthy of
being communicated to our scientific brethren.

I am, &c.

\textsc{Wrabness Parsonage,}
April 15, 1818.

\textsc{Revett Sheppard.}

* Linnaeus, in his description of the \textit{Picus tridactylus}, says, “Europæus vertice flavo,
Americanus rubro est.” It is worthy of observation, that a fine specimen, brought by my
brother Edmund Sheppard, Esq., of the Royal Artillery, (whose assiduity in collecting sub-
jects of natural history when abroad, entitles him to great credit,) from Drummond’s Island,
in Lake Huron, Upper Canada, has the crest, like the European species, of a bright yellow.

Read December 15, 1818.

I received in the last summer, by one of the whaling ships from Davis's Straits, a collection of birds, which had been made by my brother Captain Edward Sabine of the Royal Artillery, who accompanied the late expedition in search of a North-West passage. Among them were specimens of a Gull hitherto unknown and undescribed.

My brother's account of them was as follows: They were met with by him and killed on the 25th of July last on a group of three low rocky islands, each about a mile across, on the west coast of Greenland, twenty miles distant from the main land, in latitude 75° 29' N., and longitude 60° 9' W. They were associated in considerable numbers with the Sterna Hirundo, breeding on those islands, the nests of both birds being intermingled.

The male and female are nearly the same size, the latter is rather the smallest, but their plumage is exactly similar. The length of different specimens varies from twelve and a half to fourteen inches; the extent of the wings is about thirty-three inches, and the weight from six and a half to seven and a half ounces. The following is a full description. The bill one inch long, the base of both mandibles black as far as the angular projection of the lower mandible, the remainder yellow; the inside
of the mouth bright vermilion. The irides dark, surrounded by a naked circle of the same colour as the inside of the mouth; a small white speck beneath the eye, scarcely perceptible. The whole of the head and upper part of the neck a very dark ash- or lead-colour; the remainder of the neck behind and before, as well as the breast and belly, pure white; a narrow black collar surrounds the neck at the meeting of the ash-colour and of the white. The back, scapulars and wing-coverts are ash-coloured, very much lighter than the head, but darker than the corresponding parts of the Larus ridibundus; the lower ends of the scapulars are tipped with white. The first five primary quill-feathers with black shafts, the whole outer webs of these black, the edge of their upper webs white to within an inch and a half of the tips, the white sometimes continued to the tip; the tips of the first and second of these quill-feathers in some white, in others black; the tips of the third, fourth and fifth white, giving the wing when closed a spotted appearance; the sixth primary quill-feather with a white shaft, having the web more or less black, but principally white, with sometimes a black spot near the end; the other primaries, the secondaries, and the tertials white; the whole under parts of the wings white. The wings extend an inch or more beyond the longest feather of the tail. The legs, feet, and claws black; the thigh feathered to within three-eighths of an inch of the knee; the length of the tarsus one inch and a half; the length of the front toes about one inch, the inner one the shortest; the hinder toe small, and placed high. The tail with its upper and under coverts white; the tail-feathers twelve, the outer narrower than the centre ones; the outer tail-feathers about five inches long, the others in succession gradually shortening, so that the whole tail becomes forked by a diminution of nearly an inch.
This is the description of the bird in its mature and breeding plumage: it is probable, that in its immature and winter state it resembles other black-headed Gulls, in being divested of the dark colour of its head.

This species lays two eggs on the bare ground, which it hatches the last week in July: the young when first hatched are mottled with brown and dull yellow. The eggs are an inch and a half in length, and of regular shape, not much pointed; the colour is olive, much blotched with brown.

Little of course can be known of the manners and habits of these birds, for they were not seen in any other instance during the voyage through Davis's Straits and Baffin's Bay: the Esquimaux who accompanied the expedition as interpreter, and who possessed some knowledge of the native birds of South Greenland, had never observed them before. They flew with impetuosity towards persons approaching their nests and young; and when one bird of a pair was killed, its mate, though frequently fired at, continued on wing close to the spot where it lay. They get their food on the sea-beach, standing near the water's edge and picking up the marine insects which are cast on shore.

In conformity with the custom of affixing the name of the original discoverer to a new species, this bird has been called *Larus Sabini*. It will naturally fall into the division of the Gulls with black heads, of which there are several species, though most of them are but little known, and it may be distinguished by the following specific character:

*L. albidus, capite nigricante, torque cervicali nigro, rostro basi nigro apice luteo, pedibus nigris, cauda forficata.*

**Tab. XXIX.**

The forked tail of the bird will furnish ground, to those who are desirous of increasing the number of genera, to place this in a new genus
genus intermediate between \textit{Larus} and \textit{Sterna}. If every diversity of character is to become the foundation of a new genus, we shall have as many genera as there are species; and when multiplied to excess, genera will cease to afford the facility of investigation to the examiner of species which they were designed to give. Between each individual species there will always be some difference of character beyond that of colour of plumage, which may be made to constitute what with some modern ornithologists is so improperly called a generic distinction. In the present instance, the forkedness of the tail is very remarkable; but if the want of an even termination of the tail-feathers is to constitute a generic distinction, then the \textit{Larus tridactylus} must be removed from its present place and become a new genus; for the tail of that bird, though slightly forked, is certainly uneven, and more distinctly so in the younger birds.

Since I received the specimens which I have described above, I have obtained one from Hudson's Bay of another black-headed Gull bearing a strong resemblance to the \textit{Larus Sabini}, except that it has an even tail, and is without the dark collar round its neck. It is certainly an undescribed species, and must be placed in the genus \textit{Larus}, although its bill approaches more to that of a Tern than that of any other Gull with which I am acquainted. Such instances, I think, satisfactorily prove that, if every existing species were before us in one view, we should find individuals so approaching each other in particular points, as to make it very difficult to determine where to place the boundaries of genera.

Read April 6, 1819.

It is well known that birds annually change their feathers, and that in many of them the new feathers are of a different colour from those which were cast. It is also known, that several birds put on a different livery during the breeding season to that which they wear in autumn. But no writer, with whom I am acquainted, has hitherto pointed out the fact, that in some birds the full-grown feathers themselves change colour without being replaced by new ones. Some recent observations that I have made upon birds assuming their summer plumage give me reason to suppose that such a change does really take place.

In the year 1817, Mr. Youell of Yarmouth had sixteen young wild Mallards confined in a small pond by netting; and he was much surprised to find that towards the end of the year these birds put on a great deal of the beautiful plumage of the old bird, and yet that no feathers were to be found floating on the water, or scattered on the banks of the pond, as is usually the case when birds are moulting. Mr. Youell having made the same remark last year upon other birds of the duck genus, and communicated his suspicions to me, that birds sometimes change the colour of their dress without shooting their feathers, I determined to
to make such observations upon them as might tend either to establish or disprove the fact.

On the 9th of January last I received a young wild Mallard, which had nearly assumed the plumage of the adult bird. Upon examining the feathers of this bird, I found many of them which were party-coloured, the same individual feather retaining in some parts the colours of the bird during its first months, and in other parts exhibiting those of the perfect bird. A male Chaffinch, killed in February, had the feathers on the crown of the head blueish ash-colour, except at their extremities, which were rufous-brown, apparently still retaining on those parts the colour of the young bird, while the greater part of each feather had assumed that of the old one. Three specimens of the Swiss Sandpiper, in a state of change from the winter to the summer garb, had many feathers upon the breast and belly perfectly black, others perfectly white, and the rest sprinkled with black and white in various degrees; in some the black just beginning to appear, in others only a little white remaining upon them. A white-fronted goose, killed in October, had the breast, belly and sides, white blotched irregularly with black. The feathers upon those parts exhibited exactly the same varied appearance as those of the Swiss Sandpipers. A Dunlin, in a state of change from winter to summer plumage, presented a similar mixture of black and white in the feathers on the belly; but in this bird the black did not predominate so much as in the foregoing. In a young specimen of the black-headed Gull, killed the 9th of March, the scapulars were of a mixed colour, the same feather retaining some of the brown of the imperfect bird, together with the light blue ash-colour of the adult state. And the two colours prevailed in various degrees, some feathers exhibiting only the nascent shades of the ash-colour, and in others the remains alone of the
brown were discoverable. The wing-coverts were in a similar state of change. Many of the feathers on the head of a Reed-Bunting (killed the same day as the gull) were black with reddish-brown tips, the extremity of each feather apparently retaining the winter tint, while the greater part of it had assumed that of the summer.

The above observations seem pretty strongly to confirm the fact which Mr. Youell has pointed out, namely, that a change in the colour of the plumage of birds does not always arise from a change of feathers, but sometimes proceeds from the feathers themselves assuming at one season of the year a different colour from that which they have at another. This fact may be fully tried upon living birds. If the feathers of a live bird, apparently beginning to change, were marked by fastening a piece of silk to them, notching them, or otherwise, and it was observed that the first colour of the feather gradually disappeared, while the new colour extended itself more and more, till the feather had assumed that exhibited by the perfect bird, the fact would be established beyond contradiction.

Having called the attention of ornithologists to this subject, I hope it will be pursued by those who have better opportunities of investigating it than myself. An inquiry into the changes which the feathered race undergo, can hardly fail of throwing light upon the history of this beautiful and interesting part of the creation.

March 18, 1819.
XXXIV. *A Memoir on the Birds of Greenland; with Descriptions and Notes on the Species observed in the late Voyage of Discovery in Davis’s Straits and Baffin’s Bay.* By Captain Edward Sabine of the Royal Artillery, F.R.S. and L.S.

*Read April 6, 1819.*

I have much pleasure in presenting to the Linnean Society a Memoir on the Birds of Greenland. In accompanying the expedition which sailed last year in search of a North-West passage, I had opportunities, when not engaged in the official duties which I was sent to perform, of making some observations on the Ornithology of that part of the world.

Of fifty species enumerated by various authors as having been found in Greenland, twenty-four fell under my notice: some interesting facts relating to these have been ascertained, and four other species have been added to the list, one of which has not been before described by any naturalist. That so few birds were seen is to be explained by the circumstance, that the ships very rarely approached the shores so as to permit a landing; but it is confidently hoped, that the voyage which is about to be undertaken will afford facilities for more extensive research.

I have confined my account to the birds seen either in Davis’s Straits or in Baffin’s Bay, omitting all notice of those observed on the voyage when we were nearer the shores of the British islands than those of any part of Greenland.

The works which have been generally quoted are the following:

Gmelin,
I did not consider it expedient to introduce the synonyms of or reference to any other authors than those above mentioned, except the particular circumstance of any individual case required it; where such occurs, the title of the work will appear in the reference itself.

1. Falco Islandicus. Jerfalcon.


The Jerfalcon was seen in a single instance at Baffin's Three Islands, on the west coast of Greenland, in lat. 74°. It was wounded, but got away.
The progress of this bird from youth, when it is quite brown, to the almost perfect whiteness of its maturity, forms a succession of changes in which each individual feather gradually loses a portion of its brown as the white edging on the margin increases in breadth from year to year; such has been the cause of the variety of synonyms which have been referred to.

2. **Falco Peregrinus.** *Peregrine Falcon.*


Killed in the third week of September in lat. 66° N. and long. 58° W., and therefore most probably from America. Fabricius does not mention this bird as an inhabitant of Greenland. The specimen from which the note is taken was a young bird, and remained for some hours about the ship in company with three others. I have not hesitated to add the synonym of the *F. communis* to the other received ones of this species; the French specimens under that name fully proving the identity. The broad black line or patch, extending from the eye down to the throat, is a distinguishing mark of this bird, and of the *Falco Subbuteo,* or Hobby, in the various states of their plumage; the difference in size of the two species will always prevent their being confounded.

I suspect that the *Falco Lannarius* of Brünnich is a Merlin, and therefore have not referred to it. The Lanner of the *British Zoology* is a young Peregrine Falcon; but the *F. Lannarius* of Linneus and Gmelin, of Latham and others, as well as the Lanner of the *Arctic Zoology* and of Latham’s *Synopsis,* is a distinct species (as I am informed by M. Temminck) common in Russia, Poland, and Hungary, to which also the *F. Stellaris* and Starry Falcon of authors must be referred, being the same bird in a younger state.
state. These have hitherto been usually referred to as synonyms of the *F. Peregrinus*.

3. **Corvus Corax.** Raven.


Killed at Hare Island, and seen on the west coast of Greenland in lat. 75¾°. We did not notice a pied one, although such a variety is said to be common in arctic countries.

4. **Tetrao Lagopus.** Ptarmigan.


Killed June 19th at Hare Island. The females were laying: they had been abundant, but only a few were left on our arrival, several whalers having anchored there before us, the crews of which had destroyed them. Were I not quite satisfied of the identity of the species, the difference of the plumage of these birds would seem to justify a persuasion that they are distinct; but in all essential characteristics they are the *T. Lagopus*. The peculiarities which are to be noticed have escaped the attention even of Fabricius; who nevertheless describes these birds as seen during the summer. The period when they fell under my observation being that of their full breeding season, it must unquestionably be allowed that they were in perfect summer plumage. The male birds were wholly white, with the exception of the black line from the bill to the eye, of the under tail-feathers, and a very few scattered black feathers on the top of the head: even the shafts of the large quill-feathers were white; the females had not the usual portion of white on the breast; the coverings of the legs
legs were white, as were the quill-feathers, but the shafts of these were dark; the whole of the coloured plumage was more rich and gaudy than in Scottish specimens. In the latter the ash-colour predominates, in the Greenland Ptarmigan the orange. The bars of brown are also broader and deeper in the Greenland specimens.


These birds were abundant in Hare Island on the west coast of Greenland, lat. 70° 26', in the month of June, and were breeding there. We also saw them on the western coast of Davis's Straits, about the same latitude, in September. Fabricius has well described their nest as formed externally of grass, next of feathers, and lined with the hair of foxes. Eggs four or five, dirty white, spotted with ash-colour and yellowish brown; the nests are placed in ledges of the rocks. The song of the male bird was noticed frequently. Notwithstanding the deference which is due to the general accuracy of Montagu, I have ventured to place the Snow, Tawny and Mountain Buntings together, believing them to be the same species in different states of plumage, the effects of age, sex, or climate. Those seen at Hare Island exactly correspond to the Snow Bunting of Montagu, and those on the opposite coast to the Tawny Bunting.


This species was not seen on the shores of Greenland on which we landed: but on our return homewards in October, off Cape Farewell, a few were seen at a distance from the land, doubtless on their passage southward. In our outward voyage, in May, we also met with them in lat. 60° N. and long. 13° W., then most probably migrating northward.


Fabricius was the first naturalist who knew this bird to be the same in all its changes of plumage; he called it T. Striata; but it being now more generally known as T. Maritima, I have given it that name, being what it is usually called when in its summer dress: the specimens killed at Hare Island in June, and at Possession Bay on the 1st of September, were in this plumage. In its winter state it has been called the T. Striata, or Striated Sandpiper. As a British bird it has been described only in the latter plumage, and it is the Sea Sandpiper of Mr. Markwick, the Purple Sandpiper and Tringa Nigricans of Montagu. Temminck does not notice it in his Manuel. The Greenland specimens have been compared with two in my brother's cabinet of British birds, the latter having been killed in winter: the difference of the plumage of the two seasons consists in the under parts during summer having less of dusky and more of white; and the feathers of the back and scapulars being of a much deeper and richer colour, and beautifully marked with broad white edgings: a similar marking is observable, but not so distinctly, on the back of the head and
Capt. Sabine’s Memoir on the Birds of Greenland, &c. 533

and neck; there is also a little dash of ferruginous occasionally interspersed on the upper plumage. This species was found in flocks of six and eight on a shingly beach.

8. Tringa Cinerea. Knot or Red Sandpiper.

T. Cinerea. Temm. 404.


Killed at Hare Island in June. It is probably a rare species in Greenland, being unknown to Fabricius. Its various stages of plumage have been correctly described by Montagu in his Appendix, article "Dusky Sandpiper," and by Temminck in his Manuel: they had been previously involved in much obscurity, and had given rise to the variety of synonyms which are referred to. In its winter state it is the T. Canutus, or Knot; in its progress to the summer state it becomes first the T. Grisea, or Grizzled, then the T. Cinerea or Ash-coloured Sandpiper: the old birds in summer are the T. Islandica and T. Ferruginea, and Red Sandpiper: the birds of the first year, not attaining the high colour of the old ones, have been described variously; as the T. Calidris or Dusky, T. Nævia or Freckled, T. Australis or Southern, and the Aberdeen Sandpiper.

3 z 2 9. Tringa
9. **Tringa Alpina.** Dunlin.


Only a single specimen was killed. The bird is said by Fabricius to be very rare in Greenland. The fact of the *Tringa Cinclus* and *Alpina* being the same bird may be considered as established, the former in the winter and the latter in the summer plumage: for this discovery Europeans are indebted to our countryman Montagu. Even the acute and accurate Temminck has not arrived at clearness on this point in his *Manuel*, though he concludes the *T. Cinclus* as referable to the *Alpina* (his *Variabilis*) in some state. It must not be overlooked, however, that before Montagu had published his discovery, the close practical observation of Wilson the ornithologist of America, had put him in possession of the fact also.

These birds must certainly migrate from the arctic regions in the winter; since neither Brünnich, Müller, Fabricius, nor the *Fauna Suecica* make any mention of the *Tringa Cinclus*.

10. **Charadrius Hiaticula.** Ringed Plover.


Killed at Hare Island in June: perfectly agreeing with Montagu's description of British specimens; from whence it may be inferred that the remark made by Pennant of the black collar becoming
coming fainter in North America, from the effect of climate, is not correct. Montagu mentions that he has seen several of these birds which had been killed in England, in which the collar was extinct.

11. **Phalaropus Hyperboreus.** Red Phalarope.


A small flock of these birds were met with on the west coast of Greenland, in latitude 71°, in June. A considerable variation takes place in the ferruginous colouring of the sides of the neck, in some instances the colour meets at the breast, and in others it does not; it has been considered that this difference is characteristic of the sex, but I am inclined to think that such opinion is erroneous. Some authors have supposed the *Tringa Fulicaria* of Linneus’s *Systema Naturae* and of Brünnich to be the female of this species, and have consequently described it as differing extremely; but I have had no hesitation in placing the *Tringa Fulicaria* as a synonym of the true *Tringa Lobata* (not the *T. Lobata* of Fabricius, which is the present bird). The *Phalaropus Fuscus* with its synonyms is considered as the immature bird, on the authority of Temminck and the *Fauna Suecica*; but great confusion has been made in the synonyms referred to by other writers. I am not acquainted with the winter plumage of this species; but think it probable that the ferruginous tints are peculiar to the summer months, as the specimens killed in June were very irregularly and uncertainly marked.
12. **Phalaropus Platyrynchos.** Flat-billed Phalarope.

Phalaropus Platyrynchos. Temm. 459.


**Young.** Tringa Lobata, var. β. Gmel. i. 674.

However unwilling I feel to admit alterations in names, I am induced to do so in the present instance, and to adopt Temminck’s specific appellation, both as appropriate, and distinct from the confusion in which the various other synonyms which are referred to are involved. The specimen from which the account is taken was killed on the 10th of June, out of a flock of four, on the west coast of Greenland, in latitude 68°. They were swimming in the sea, amongst icebergs three or four miles from the shore. From the considerable difference between the summer and winter plumage of this bird, it is not surprising that so many mistakes have been made. My specimen, which was a male, agrees with Temminck's description of the full-plumaged bird in summer, except that the whole under parts have a considerable quantity of white mixed with the brick red, the white being rather predominant. Before I had an opportunity of consulting the *Manuel d'Ornithologie*, which confirmed my opinion, I had arrived at the conclusion that the *Tringa Fulicaria* of Brünnich was this bird: his accurate description of the bill left no doubt in my mind, notwithstanding the difference in the plumage, the consequence of season. Fabricius enumerates the *Tringa Fulicaria* in
in his *Fauna Groelandica*; but the bird itself does not appear to have fallen under his notice: he was aware, however, that it could not be referred to his *Tringa Lobata*. This species is only known to British naturalists in its winter state.

13. **Alca Alle. Little Auk.**


This species was abundant in Baffin’s Bay and Davis’s Straits; and in latitude 76° was so numerous in the channels of water separating fields of ice, that many hundreds were killed daily, and the ship’s company supplied with them. The whole of the birds in the breeding season (the sexes being alike) had the under part of the neck an uniform sooty black, terminating abruptly and in an even line against the white of the belly; the young birds, which we saw in all stages from the egg, as soon as they were feathered were marked exactly as the mature birds: but in the third week of September, when we were on our passage down the American coast, every specimen, whether old or young, was observed to be in change; and in the course of a few days the entire feathers of the throat and cheeks and of the under part of the neck had become white; this latter state has been erroneously considered by some authors as that of the immature bird. It has been correctly described however by Fabricius as the winter plumage. Montagu arrived at the same conclusion in his *Supplement*. We saw neither of the varieties which Fabricius remarks that he had heard of; namely, a red-breasted variety, and one wholly white.

14. **Uria**

Until the last autumn this bird was known to naturalists on the authority alone of Brünnich; who, in his *Ornithologia Borealis* having described the species at present denominated the *Uria Troile*, under the specific name of *Lomvia*, proceeds to notice the existence of a second species much resembling it, and which he names the *Uria Troile*: this second species is the present bird. Linneus originally called the first bird *Alca Lomvia* in his *Systema Naturae*, edit. 10. (1758) vol. i. 130; but in the second edition of his *Fauna Suecica* (1761), he named it *Troile*. Brünnich in 1764 took up the specific appellation of *Lomvia* from the *Systema Naturae*, adding the description he found given of it in the *Fauna Suecica* under the name of *Troile*, and applied *Troile* to his new bird, referring, however, to the *Fauna Suecica* probably as authority for the name. From this confusion I apprehend it has arisen that both these birds have not since Brünnich published his work been noticed by general authors as distinct species. Dr. Leach on examining this bird ascertained it to be a distinct species; and not being aware that it had been previously distinguished and described by Brünnich, exhibited it at the Linnean Society as a new species, under the name of *Uria Francsii* in compliment to Mr. Frederick Franks, whom he then supposed to have been the person by whom it had been first killed. I have already had occasion, when speaking of the *Phalaropus Platyrynchos*, to remark the accuracy in observation of Brünnich. It is but justice to attach his name to a species of which his claim to priority of knowledge and of communication is unquestionable. Latham (*Synopsis* vi. 330) notices this bird of Brünnich's, but considers it a variety of the Foolish Guillemot.

The *Uria Brünnichii* was found in abundance in Davis's Straits, and
and occasionally in Baffin's Bay. A specimen killed on the 10th of June had the feathers of the throat mottled with white; from whence I infer that it undergoes the same changes from season as the *Uria Troile*. A matured specimen was sent by me to my brother, and reached England towards the close of the summer; several were subsequently brought home by the expedition which visited Spitzbergen, as well as by that which went to Baffin's Bay.

It is extraordinary that a species so abundant in the Greenland seas should be unnoticed by Fabricius; it must have escaped his observation altogether, as he has not even mentioned the *Uria Troile*, for which it might on a slight view be mistaken. Length 17 inches—extent 2 feet—weight 2lb. 6oz.; inside of the throat yellow, irides dark; throat and neck sooty brown; head black; hind head, hind neck, back and wings, dark sooty brown; the wings being lightest, and the secondaries tipt white; the feathers of the head and neck have a peculiar smoothness and softness; from the eye to the hind head is a line occasioned by a division of the feathers; belly and all beneath pure white, running up to a point in the neck; the feathers are very thick, and on being removed a dark down appears between them and the skin; legs marbled, brown and yellowish; claws black; no difference in plumage between the sexes. With the exception of the colour of the dark plumage, this description might be applied to the Foolish Guillemot; but the specific distinction is well pointed out by Brünnich in the following words: "*Lomviae in omnibus simil-lima, excepto rostro latiori et breviori, cujus margines etiam in exsiccatis exuviis flavescunt.*" The yellow margin extends from the corner of the mouth, along the edge of the upper mandible, to the point to which the feathers project on the bill; it is rather horn-coloured than yellow. Brünnich mentions three other birds,
Nos. 110, 111 and 112, which he calls Svarbag, Ringvia and Alga; the two former Iceland and the latter Danish birds: he is undetermined whether these be distinct species, or the present in different states of plumage: I am inclined to consider the latter supposition as the correct one.

It will be necessary to make some alteration in the specific character of *Uria Troile*, as given in Gmelin and Latham, to distinguish it from *Uria Brünnichii*. It is therefore proposed to describe the two species as follows:

**U. Troile.** *U. corpore fusco, pectore abdomineque niveo, remigibus secundariis apice albis, rostro longitudine capitis: mandibula superiore quadruplo longiore quam lata.*

**U. Brünnichii.** *U. corpore fuliginoso, pectore abdomineque niveo, remigibus secundariis apice albis, rostro capite breviore: mandibula superiore triplo longiore quam lata.*

**15. Uria Grylle. Black Guillemot.**


The states of plumage of this bird are clearly described from the extensive and accurate observation of Fabricius. The young, when just feathered, are spotted black and white beneath, but otherwise resemble the parents. On the approach of winter the whole become varied with black and white; the feathers of the back margined with white; the head, throat and breast, white lightly spotted with black, the wings continuing black, and the
speculum white. In this state it has been described by Brünnich as the *Uria Balthica*, No. 115. In mature winter plumage the whole bird is more or less speckled, and the upper feathers of the wing spot become tipt with black, giving it a mottled appearance. It is then the *Uria Balthica*, No. 116, of Brünnich. A male specimen, killed in November at Shetland, having the wing spot mottled, shows that this circumstance is not peculiar to the females, as has been supposed. In the spring the plumage gradually re-assumes the black. A male killed in Davis's Straits early in June, had the whole head and neck mottled with black and white, equally distributed; the plumage beneath and the back being black with a few white feathers dispersed; the lower part of the abdomen gray as in the neck; the speculum still mottled, but with the white predominating. This bird was killed on our first arrival in the Greenland seas; and it is presumed that the change to full summer plumage was proceeding very rapidly, as we did not afterwards see a mottled bird. The legs of the November and June specimens were red, though not so bright as in summer. The breeding plumage is too well known to need description.

We did not see a variety, unless a specimen killed in September having the primaries rusty brown instead of black may be considered such: the varieties which are noticed by Gmelin, and also by Latham in the *Index Ornithologicus* and in the *Synopsis*, and which are supposed to be found in different places, are referable to the changes of plumage which this bird undergoes during the winter.
16. **Columbus Septentrionalis.** Red-throated Diver.


Killed June 30, on the west coast of Greenland, in lat. 71°. The rich chesnut marking on the throat is conical in shape, having the apex, which is sharply pointed, at the throat, and the base resting on the white of the breast; the back of the specimen is slightly sprinkled with white spots, showing that it is a bird of the third or fourth year. Following Temminck, the *Columbus Stellatus* and *Striatus*, with their synonyms, are here introduced as the immature birds of the present species: Fabricius was aware of the change of plumage, and has described the mature bird well; but no author before Temminck appears to have supposed that the Striped and Speckled Divers were referable to this species.

17. **Sterna Hirundo.** Common Tern.


Abundant on the coast of Greenland. In the accounts of the authors who have been cited, a difference is observable in the description of the colour of the forehead of this species: by some it is represented as white, and by others as black: the specimens which
which were obtained, and which were very numerous, were all of
the latter plumage, which is certainly that of the perfect adult
bird. The white feathers on the forehead are found only on young
birds of the first year considerably advanced towards maturity.
In a still younger state it is supposed to be the \textit{S. obscura} or Brown
Tern of Gmelin and Latham, and perhaps also the \textit{S. nigra} of the
\textit{Fauna Suecica}, Müller and Brünnich. There is a remarkable dif-
fERENCE between the Greenland common Terns and those of the
European coasts, in their bills and legs; the bills of the Greenland
birds are one-third shorter than the European ones, and the tarsi
of the former are only half the length of the latter.


The largest of the known Gulls. This bird was once, and once
only, seen from the ships, when they were high up in Baffin's Bay,
but at a distance too great to obtain a specimen. It was known
to Fabricius both in its mature and immature plumage; but he
was probably mistaken in considering the \textit{L. varius} of Brünnich
as a synonym of the young bird: that from its size is probably an
immature Herring Gull. The \textit{L. marinus} is too well known to
need a particular description.


Notwithstanding the confusion in which the larger species of
Gulls
Gulls are involved, there appears no doubt of the application of all the above references to the species now under description. The \textit{L. glaucus} of Temminck is not quoted, because, as will be hereafter shown, it is a different species.

None but mature birds in the perfect summer state were killed during the voyage, but these were very common throughout Davis's Straits and Baffin's Bay. I am fortunately able to make the history of its plumage complete from specimens in my brother's collection of British birds; and I am happy thus incidentally to record it for the first time as an addition to British ornithology.

In immature plumage it is mottled throughout with an uniform light-brown and white, being distinguished from the young of other well-described species by being without the darker marks on the wings and tail: during the first year the bill has the upper mandible less arched, the angular projection of the lower mandible not so defined, and the extremities of both lead-coloured. In winter the mature bird has the head and neck mottled with brown, as is usual with all the white-headed Gulls. In the perfect summer state, the whole plumage is white excepting the back, scapulars, and wing-coverts, which are a very light ash-colour; the primary quill-feathers are still lighter, the ends and under part being pure white; there is no black whatsoever on any part of the plumage: hence the bird from Hudson's Bay, described in Latham's \textit{Synopsis} at the page referred to above, with six of the primary quill-feathers black at the ends, must have been another species.

When arrived at maturity the bill is three inches in length, of a lightish horn-colour, the angular projection of the lower mandible being bright red; orbits naked, straw-coloured and very fierce; legs and feet a livid flesh-colour. In size it is somewhat inferior to the \textit{L. marinus}; the bill, tarsus, and body of the latter being decidedly greater. Length of a male specimen twenty-nine inches.
Capt. Sabine's Memoir on the Birds of Greenland, &c. 545

inches and a half. Extent sixty-three inches. Weight 4 lb. 8 oz. Length of the tarsus two inches seven-eighths; the females averaged rather less. Temminck (Manuel, p. 490, note) appears to have seen an immature specimen of this bird, to which he was disposed to give the name of *L. giganteus*: this name would not be a correct one, because it is a smaller bird than the *L. marinus*. Temminck identifies his specimen with the *L. Ictyætos* of Pallas, but that bird is a black-headed Gull.

The *Larus glaucus* is unquestionably the Burgomaster Gull of the Dutch, and preys on smaller birds as well as on fish. One specimen which was killed disgorged a little Auk when it was struck, and proved on dissection to have a second in its stomach.

I am indebted to Mr. James Ross, a midshipman of the Isabella, (one of the Discovery ships,) for a singular specimen of a Gull which, though differing in several points, I conceive must be placed under this species: it was shot on the 6th of June near the middle of Davis's Straits. Its description is as follows:

Length twenty-six inches; extent fifty-eight inches; a male bird; plumage wholly white, the feathers of the hind head, neck, back and wings being occasionally tinged with a very faint brownish hue; the legs and feet flesh-coloured; length of the tarsus two inches and a half; irides deep brown; the length of the bill from the corner of the mouth two inches and a half, being full half an inch shorter than in the usual specimens of the *Larus glaucus*; the bill is a yellowish horn-colour, the ends of both mandibles being a lead-colour. From the colour of the bill and the faint spots on the feathers, this bird was evidently immature; and it may reasonably be presumed that its full plumage would have been entirely white. In this, and in its smaller size, it differs strongly from the Glaucous Gull; both of these circumstances, I conjecture,
conjecture, may have been caused by sickness or by scanty supply of food.


The bird now under consideration does not appear to have been described in any of the books which are referred to in this memoir. It is necessary therefore to explain why the name of *argentatus* or silvery, which has been used before, has been attached to it. A *Larus argentatus* was introduced by Brünnich, who was followed by Gmelin; but the bird to which the name was applied is evidently the *Larus fuscus* or Herring Gull of Latham, in winter plumage: as is also the Silvery Gull of the *Arctic Zoology* and of Latham's *Synopsis*. In this opinion Temminck concurs, as is shown by his quotations in his *Manuel* under the head of *Larus glaucus*. Latham in the *Index Ornithologicus* takes up the *Larus argentatus* of Brünnich, but considers it erroneously as an aged bird of the *Larus marinus* or Great Black-backed Gull. Montagu finding the term *argentatus* at liberty, applied it in his *Dictionary* to his Less Black-backed Gull; but it will be seen by reference to the *Manuel* of Temminck that the Less Black-backed Gull is the *Larus fuscus* of Linneus and Gmelin.

I apprehend that the reason why the bird under consideration has not been hitherto distinctly described is to be found in its general resemblance to the *Larus glaucus*: it will be therefore best distinguished by a comparative description. In the general character of the plumage they are alike, differing from the other large species of this genus in the entire absence of black in the primary quill-feathers; the shade of the ash-colour of the back, scapulars, and coverts, varies in different specimens from almost the lightest perceptible tint to a darker than the darkest *Larus glaucus* that was killed on the voyage; the principal distinction between
between the two species is in the difference of size; the males of this species average twenty-four inches in length, and the females rather less: extent four feet five to four feet six inches: the legs and bill of both are alike, except in size: length of the tarsus two inches and a half; the wings of the argentatus are rather longer in proportion than those of the glaucus.

These birds were abundant in Davis's Straits and Baffin's Bay, but were only seen in mature summer plumage: from analogy it may be expected that the immature birds will resemble those of the Glaucous Gull.

I should have been disposed to have considered this bird as a new and undescribed species; but in a personal communication with Mr. Temminck, whose extensive skill and judgement in ornithology are only equalled by the liberality and kindness with which he communicates his knowledge, I have learned that he considers the bird of Greenland to be specifically the same with the Herring Gull of the more southern shores of Europe; but that from the effect of climate the black markings of the primary quill-feathers, which have been hitherto considered an essential characteristic of the species, are changed to white in the arctic countries. The mature summer birds of Greenland (in which state only I have seen them) certainly strongly resemble our Herring Gull in all other points. In deference therefore to such high authority, I add the synonyms of the authors I quote belonging to that bird, as it is found in temperate climates.


Before I had the pleasure of meeting with Mr. Temminck, he had designed to give the specific name of argentatus to the European bird; it will therefore remain as I have placed it at the head of this species: the name of glaucus, which in his Manuel was given to the Herring Gull, will be removed by him to the true Glaucous Gull. It is singular that Pennant, in his Arctic Zoology, under the head of Herring Gull, states that bird to be common in Greenland throughout the year; though no other writer, as far as my observation has extended, mentions the circumstance, and we did not observe a single one with black primary quill-feathers during our voyage in the Straits.


Abundant in Baffin's Bay. Authors describe the length of this bird as sixteen or seventeen inches; the matured specimens obtained, averaged twenty inches; but an immature one measured an inch less. Weight about twenty ounces. Nothing can exceed the beauty of the delicate snow-white plumage of this species in its maturity: I apprehend that this takes place at the end of the second year; on the 24th of August the young birds were observed in flight, much mottled with brown about the head, and probably also about the wings, though not so visibly. A specimen killed the first week in June, of a bird apparently of the preceding year, has a few light-brown feathers about the bill, extending towards the eyes, a very small transverse band of brown spots across the primary wing coverts, thickest at the point of the wing; the primary quill and the tail feathers slightly tipped with brown. Since my return I have seen a specimen of an immature bird with the ends of the primary quill-feathers and of the tail-
feathers tipped with brown: the bill of the immature bird has the extremity yellow as in the mature bird. The wings of this species extend an inch and a half beyond the tail: the legs are black, and the skin very rough; they are feathered within a very short distance of the knee: length of the tarsus only one inch and a half; the claws are much hooked: irides dark brown in every specimen: the legs and bill of the mature birds agreed in colour with the descriptions of the authors quoted; the hind claw is sufficiently conspicuous, though Fabricius says not. These birds are attracted in considerable numbers by whale blubber, and are therefore usually found in company with the Procellaria glacialis; they are easily killed, being by no means shy.

22. **Larus tridactylus.** Kittiwake Gull.

It is expedient to distinguish the different states of plumage of this bird, in reference to the authors quoted. Temminck is the first writer who appears to have had a full knowledge of the changes it undergoes. The mature summer plumage is wholly white, with the exception of the back and wings; these are of a deep ash-colour: the black markings of the primary quill feathers have been correctly described by Temminck. In the autumn, the white at the back of the head and neck is changed into a light ash-colour, which is rather deepest behind the ear, forming the appearance of a spot: the small feathers under the eye are also
also rayed with black. The young birds when full grown have this autumnal appearance with additional differences correctly described in the *Fauna Suecica*; the bill is black instead of yellow; at the back of the neck the feathers are tipt black, forming a narrow crescent-shaped patch; the wing coverts are tipt black, forming a bar across the wings; primary quills black, with more or less of the inner webs in different specimens white: tail tipt for half an inch with black, except the outer feather on each side, the second having only a spot on the inner web. It is worthy of observation that the outer tail feathers are somewhat longer than the inner ones, giving the tail an appearance of being slightly forked; this is more perceptible in the young birds than in the old ones.

The specific name of *tridactylus* (though given by Linneus to the immature bird) appears preferable, as being more appropriate than that of *Rissa*: it is therefore adopted. I am inclined to suppose that this species attains maturity at the age of one year. In June none were seen with spotted plumage; early in October several immature birds were killed, being marked as above described: the specimens noticed by Montagu as killed in the month of March, and supposed by him to be in complete plumage, had evidently not got rid of all the black markings on the wing coverts, which I believe would have taken place, had they lived a few weeks longer.

The *L. tridactylus* of Gmelin and Müller, and the Tarrock Gull of the *Arctic Zoology*, are the young bird after it has lost the black bar upon the wing, and before the colour has disappeared from the neck and from the tips of the tail-feathers. It is apprehended that the *Larus cinerarius* of Fabricius is the *tridactylus* in winter plumage: its rarity in Greenland, as noticed by him, may be accounted for by the probability that most of these Gulls migrate southwards during that season.

A full description of this bird having been already presented to the Society*, it is unnecessary to repeat the account.

Mr. Temminck informs me that he has seen this bird in the Museum at Vienna, where it was proposed to call it Larus collaris, but that it has not been described by the ornithologists of that capital, or by any author whatsoever before the Memoir above referred to was presented to the Society. The specimen, he thinks, was obtained from Professor Giesecké; but the bird is not to be found in a MS. list of Greenland birds in his own hand-writing, with the sight of which I have been favoured by Mr. Bullock, nor is any other Gull there mentioned with which it could possibly have been confounded.

24. Lestris Parasiticus.

Catharacta Parasitica. Fabr. 103.


In brown plumage. Catharacta Coprotheres. Brün. no. 128.


I have followed the example of Temminck in removing this with the other dark-coloured Gulls from Larus and giving them the generic appellation of Lestris. Much inaccuracy as well as difference of opinion has existed respecting not only the immature, but the mature birds of this species. The immature bird has been described as a distinct species. Montagu was the first author who had a doubt of the correctness of this arrangement, but he erred in considering the young bird as a variety only. It has been called

* See page 520 of this volume.
called by the different names cited above, during the first year of its existence, when its tail is destitute of the long feathers, and its whole plumage is marked with transverse bars of light-brown and dingy white. The markings do not entirely leave it in the second year, but are perceptible in the under parts of the wings and in the adjoining under parts of the body: at this period the two centre tail feathers have become elongated, the breast and throat have become white, though sometimes spotted a little, and the ends of the feathers of the back and wing coverts are tinged with brown, the crown of the head being dark brown. As the birds advance in age the under parts and back of the neck become white stained more or less with brown, and the sides and back of the neck are tinged with yellow; the crown of the head and the whole upper parts except the neck are an uniform dark brown, and the two tail feathers are much lengthened. In all these changes there are however considerable variations; and even in the description of the immature bird as a separate species, authors have varied according to the age of the specimen before them. Fabricius's observations ascertained that there was no difference between the sexes; and as he saw them at their breeding places he must have been aware of their difference of plumage in their young state. I learn from Mr. Temminck, who has had recent opportunities of investigating the history of this bird, that he is satisfied the males and females of the same age are alike, and that he is convinced of the specific identity of the *Larus crepidatus*. But the great difficulty is where to place the birds which have their whole under parts brown: these have been erroneously considered by many as the females, and Brünnich made them a distinct species,—the elucidation of this point must wait for further investigation. Several birds in that state of plumage, but no young ones, were killed during the voyage in the Straits.
25. **Procellaria Glacialis.** Fulmar Petrel.


These birds are very abundant at all times in Baffin’s Bay and Davis’s Straits; the greater part in the plumage described by authors generally: but some were occasionally seen in which the whole under parts as well as the head and neck were ash-coloured, instead of white; and the back and wings of a darker shade: these latter birds agree with the plumage which Temminck has assigned to the young birds; if they were such, the species is two years in attaining maturity, because we killed full-plumaged birds of this character in June; the difference cannot be sexual, as males and females in each colour were obtained.

 Whilst the ships were detained by the ice in Jacob’s Bay in latitude 71°, from the 24th of June to the 3d of July, Fulmars were passing in a continual stream to the northward, in numbers inferior only to the flight of the passenger pigeon in America.

 Latham appears to have been in error in his *Synopsis* in referring to Brünnich as an authority for the tail of this species being black: we did not see any birds so marked.

26. **Anas Spectabilis.** King Duck.


I am indebted to Mr. Skene, midshipman of the Isabella, for the only male specimen of this most beautiful Duck, which was shot during our voyage. They were very numerous on the coast of Greenland in company with the Eider Ducks; but they were too shy to approach the ships, and opportunities of seeking them on
on shore were very rare and very hurried. Two females were killed, agreeing as well as the male with the descriptions of authors. It is reasonable to suppose that they are the same number of years in attaining maturity as the Eider Duck; but the different states of their immature plumage have not as yet been noticed. This is one of the desiderata which it is hoped the next voyage will supply. The rarity of this bird in the milder parts of Europe, and the want of specimens of it in the best collections, have occasioned it to be imperfectly known, except amongst the writers on the ornithology of the northern regions. Temminck in his *Manuel* considers it as the *Anas mollissima* in one of its changes; this is the cause that there is no reference to his work amongst the books cited. It is however noticed in the second edition of his *Manuel*, now preparing for publication, as a distinct species.

The trachea of the King Duck has so close a resemblance to that of the *Anas mollissima* or Eider Duck, that one description and figure will suffice for both: they are represented in the annexed plate. Tab. XXX. Fig. 1 and 2.

27. **ANAS MOLLISSIMA. Eider Duck.**


Abundant on the coast of Greenland; but we were not fortunate in obtaining many specimens. According to Fabricius these Ducks congregate in immense flocks during the winter. Brünich has described the male of various ages, as well as the female, and several varieties: according to his account the male is not perfectly mature in plumage till the fourth year; he describes the male at one year old as having white as well as black markings on various
various parts; but a young male which was killed in June exactly resembled the female in colour, though much larger in size. A specimen of a young male, which I obtained in June, had no appearance of change from the brown plumage, and certainly was not a bird of that year; I have therefore formed an opinion on this point different from that of Brünich. The trachea of the male is uniform in size, rather compressed; the tympanum is small and flatly globose; the branchiae are of different sizes, the larger one being dilated considerably in the centre.

28. **Anas Glacialis. Long-tailed Duck.**


As the Long-tailed Duck only winters in Europe, returning to the arctic regions in the summer, the state of its plumage at the time we were in Baffin's Bay is interesting. I obtained a specimen of a mature male on the 30th of June. Its winter dress has been detailed by several of the authors referred to, but I believe a description of its summer plumage will be new. The whole under part of the neck and the breast is black, the appearance of the black spot so conspicuous in winter being removed by the general diffusion of the dark feathers; the sides of the head and a little beyond the eye are a brownish white; round the eye are some white feathers; from the bill a black line runs on the top of the head to the crown, which is black; the back of the neck is chiefly black, but at a small distance below the crown a few white feathers are intermingled with the black ones across

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the neck; the black of the back of the neck extends down the back, but in the centre of the upper part of the back near the neck is a patch of black feathers edged with ferruginous; the scapulars are long and narrow, black in the centre and edged with ferruginous-white, the longer ones having more white; the wings are a brownish-black, the quill feathers being the palest; the lower belly and sides to the rump and the under tail-coverts are white, a line of black descending between the white from the back to the tail; of the four middle tail-feathers two are eight inches, the others are about four and a half inches long. Brünnich gives this bird in five different states of sex and plumage, the second (No. 76) is the male in summer plumage. Montagu, in the Appendix to his Supplement, has described the trachea well; the figures in the annexed engraving, Tab. XXX. fig. 3 and 4, will convey a very correct idea of its appearance: it is most curious and singular in its construction; the window-like formation at the lower part next the tympanum is particularly so.

Subjoined is a complete list of the birds of Greenland, as far as I conceive they are at present ascertained; the Fauna Groenlandica has been taken as the foundation thereof, and the alterations which appear to be necessary have been made in it.

The species enumerated by Fabricius are fifty-four: I have reduced five of these, considering them as synonyms of some of the others, but have enlarged the list again by the addition of an equal number of species which had not fallen under the notice of that author; the names of the five reduced species are placed in italics under those to which I have referred them; and the added species are marked with an †; in those cases where I have given the bird of the Fauna Groenlandica under a more correct name, the synonym of that work follows in the same line in italics. The birds which are marked * are described in the preceding pages.

1. Falco
Capt. Sabine's Memoir on the Birds of Greenland, &c. 557


* 2. —— Islandicus. *Falco Islandus.*
   —— rusticolus.
   —— fuscus.

†* 3. —— peregrinus. Not mentioned by Fabricius, or by any other author, as a bird of Greenland.

4. Strix nyctea.

5. —— asio. Fabricius had not seen this bird himself.


* 7. Tetrao lagopus.

* 8. Emberiza nivalis.


10. —— linaria.


15. —— gallinago. This and the preceding species are very rare according to Fabricius.


17. —— interpres. Not seen by Fabricius.

†* 18. —— cinerea. Not mentioned by Fabricius or by any other author as a bird of Greenland.

* 19. —— Alpina.

* 20. Charadrius hiaticula.


* 23. —— platyrynchos. *Tringa fulicaria.* Not seen by Fabricius, but described as a Greenland bird by Brünnich.

25. Alca torda.
   —— pica.
26. —— Arctica.
* 27. —— alle.
* 29. —— grylle.
30. Colymbus glacialis.
* 31. —— septentrionalis.
* 32. Sterna hirundo.
* 33. Larus marinus.
* 34. —— glaucus.
†* 35. —— argentatus. Not noticed by Fabricius.
* 36. —— eburneus. Larus candidus.
* 37. —— tridactylus.
   —— cinerarius. Not seen by Fabricius.
* 40. Procellaria glacialis.
41. —— puffinus.
42. Mergus merganser. Not seen by Fabricius.
43. —— serrator.
44. Anas anser. Not seen by Fabricius.
45. —— bernica.
* 46. —— spectabilis.
* 47. —— mollissima.
48. —— boschas.
49. —— clangula.
   —— glaucion.
* 50. —— hyemalis.
51. —— histrionica.

52. Peli-
52. Pelicanus carbo.

53. ———— graculus. Pelicanus cristatus.

54. ———— Bassanus. Only seen off the coast; not an inhabitant.

Of the above fifty-four species, I have in the preceding pages described twenty-eight which came immediately under my own observation. Of the twenty-six species which I did not meet with, six were not even seen by Fabricius, and others are unquestionably rare birds in Greenland.
XXXV. Characters and Description of Lyellia, a new Genus of Mosses, with Observations on the Section of the Order to which it belongs; and some Remarks on Leptostomum and Buxbaumia.

By Robert Brown, Esq. F.R.S. Libr. L.S.

Read April 6, 1819.

In the tenth volume of the Society’s Transactions, I have given a description of Dawsonia, a genus of Mosses having entirely the habit of Polytrichum, but whose peristomium, instead of consisting of a single row of short teeth connected by a horizontal membrane, is composed of an indefinite number of capillary cilia. These cilia, originating both from the inner surface of the capsule, immediately within the orifice, and from the columella itself, form a loose pencil, of which the hairs are sufficiently distinct to allow of a gradual discharge of the seeds.

The correctness of this account of Dawsonia, especially as to the origin of the peristomium*, and the nature of the supposed columella†, has been questioned by some of those authors, who have since adopted the genus.

From a careful re-examination, however, I find no reason to alter in any respect the generic character formerly given; and to the description of the species I have only to add, that the upper surface of the leaves is furnished with parallel lamellæ, like those of Polytrichum; and that the inner membrane of the capsule is,

† De la Pylaie in Journal de Botanique appliq. iii. p. 134.
in the early stage at least, connected by numerous plicae with those elevations of the surface of the columella, which are noticed in my description, and well expressed in Mr. Bauer's excellent figure.

My principal object, in the present paper, is to establish another genus of the same family, equally related to Polytrichum in habit, which resembles Dawsonia in the remarkable form of its capsule, but whose peristomium is of so peculiar a structure as to require its separation from both these, and readily to distinguish it from all other genera of Mosses.

This new genus I shall name *Lyellia*, in honour of Mr. Charles Lyell, an accurate English Botanist, who has particularly studied, and made several important discoveries in, the natural order to which it belongs.

Mr. Hooker has already intimated his intention of establishing a *Lyellia* in the same order, to consist of those species of Leuco don that have a mitriform calyptra*; but he has readily agreed to transfer the name of our friend from a genus, respecting which there is still some uncertainty, to one so unquestionable as that here proposed; and as I have not a drawing prepared to accompany the present communication, I trust he will give the necessary illustration of this interesting genus, in an early number of his excellent *Musci Exotici*.

**LYELLIA.**

*Stoma edentulum, clausum epiphragmate (crasso depresse), cujus discus circularis a limbo (latiori) persistenti secedens, cum columellâ remanenti inclusâ cohæret.*

*Capsula hinc plana inde convexa.*

*Calypttra cucullata (apice pilosa).*

*Musci Exotici, vol. i. 17.*

*Muscus*
Mr. Brown on Lyellia, Leptostomum, and Buxbaumia.

Muscus (Nepalensis) habitu Polytrichì; capsulae figurā et structurā interiori Dawsoniē similis; peristomio ab utroque genere diversissimus.

**Lyellia crispa.**

**Descripțio.** Muscus cæspitosus.

Caulis erectus, simplicissimus, 3-4-uncialis, ipsa basi tomento radicāli cinereo copioso tenuissimo tectus, dein, ad ½ circiter longitudinis, basibus emarcidīs foliorum squamatus, supra dense foliatus.

Folia undique versa, e basibus dilatātis subcuneātis semivaginantibus membranaceis pallidis imbricatis, subulata, canaliculata, nigro-viridia, opaca; marginibus ab apice ad ½ longitudinis et ipso apice carināe serratis; disco intus longitudinaliter lamellis numerosīs, parallelo-approximatis, tenuissimis, e nervo ipsaque superficie ortis; limbo clamello lato minutissime areolato; madore patula leviterque introrum falcata, siccitate contorta.

Masculi Flores non visi.

Fructificatio Femīnea terminalis, solitaria.

Vaginula cylindracea, villis implexīs instructa, apice truncato simplici.

Seta sesquïuncialis—biuncialis, erecta, teres, lævis, castanea, demum cava.

Calyptra (nonnullae delapsae solum a nobis visae) cucullata, hinc altē fissa inde truncata, lævis, apice pilis brevibus simplicibus hispidula.

Capsula erectiuscula, circumscriptione ovata, fusca, vix manifeste areolata, hinc plana et ala perangusta cincta, inde convexiuscula, collo brevissimo cylindraceo. Apophysis nulla nisi basis castaneo-fusca et undique instructa punctis parvis, sparsi numerosi, pustuliformibus, verticaliter elipticis
lipticis, margine paulo incrassatis, disco angusto, porum referente sed laminam tantum exteriorem perforante.

Operculum (unicum tantum visum quod calyptra delapsa inclusum) e basi depresso-conica desinens in rostrum longitudine circiter ipsius baseos, intus auctum processu cylindraceo, centro baseos inserto, et proculubio disco circulari terminali columnellæ applicito.

Peristomium horizontale, nec obliquum, clausum quasi operculo interiori seu epiphragmate crasso, opaco, edentulo, planiusculo, persistente; limbo latiusculo crassiore castaneo; disco pallido leviter depresso; ipso centro circulari plano, crassiusculo fusco, a disco pallido mox separante, arcte cum columella coherentis, eaque demum abbreviata intra cavitatem retracto.

Membrana interior (s. Theca vera) approximata exteriori, quacum processubus numerosis vasculiformibus connexâ, ore coarctato, spongioso-membranaceo, collum breve columnellæ arcte amplexante, superficie interiore altè corrugata. Columella in capsula matura majuscula, subovalis, lacunosa, rugis elevatis applicitis et forsan connexis plicis respondentibus membranæ interioris.

Semina minutissima, in cumulo viridia, separatim hyalina, lævia.

Lyellia crispa was lately discovered in Nepaul (probably in the vicinity of Kathmandu,) by the botanical collectors sent from the Company's garden at Calcutta, by Dr. Nathaniel Wallich, the worthy successor of Dr. Roxburgh in that establishment.

The specimens here described were received from Dr. Wallich by Sir Joseph Banks; and I have also seen others sent at the same time to Mr. Lambert, part of which he very liberally communicated.
Mr. Brown on *Lyellia, Leptostomum, and Buxbaumia.*

The whole number of capsules examined does not exceed twenty-five; but as all of these were ripe and of uniform appearance and structure, they will probably be considered sufficient for the establishment of the genus.

To complete the description of *Lyellia,* male flowers, which, however, probably resemble those of *Polytrichum* and *Dawsonia,* are still wanting; and although there is no reason to doubt that the calyptra and operculum, both of which I have ventured to describe from fallen specimens, really belong to this species, yet it would be more satisfactory to find them while still attached to the capsule; for in this state only, the form of the operculum and its probable central connection with the orbicular disk of the peristomium can be absolutely determined. It will be necessary also to examine a greater number of specimens, and perhaps in different states, to ascertain absolutely the economy of this moss in the dispersion of its seeds. It is evident, however, if the description already given be correct, that as far as dispersion takes place, by the mouth of the capsule, it can only be effected by a contraction or shortening of the columella, and a corresponding retraction within the cavity of the capsule, of the central portion of the peristomium which adheres to it; and in this state several of the specimens were actually found.

But it is also manifest, both from the great size of the columella, and its numerous points of connection with the inner membrane, that in this way the whole of the seeds cannot be discharged. It is possible therefore, that in certain circumstances at least, their dispersion may be assisted by the minute pores existing at the base of the capsule. These pores, in the specimens examined, were found to penetrate the outer membrane, or even its external layer only, and being situated below the origin of the seminal bag, their first effect will probably be to accelerate the decay of the internal spongy
spongy texture of the base of the capsule. But by thus removing support from the columella and inner membrane, they may contribute to the greater shortening of the former, and consequently in increasing the dispersion by the mouth of the capsule; or, from the same cause, the inner membrane being at length ruptured, the seeds may be in part discharged by the pores themselves.

It seems then not improbable, from what we at present know of the structure of *Lyellia*, that for the dispersion of the seeds in this genus there are two distinct contrivances, both of which, however, in the only species yet known, are apparently imperfect. But hence it is perhaps allowable to conjecture, that either other species of *Lyellia*, or a nearly-related genus may exist, in which while the mouth of the capsule remains absolutely shut, the pores of the base may be sufficiently enlarged for the complete performance of this important function.

Pores exactly resembling those of *Lyellia crispa* have not hitherto been found in any other moss. I have observed, however, in several specimens of *Polytrichum alpinum* still more minute pustules, not very different in appearance, and similarly situated on the base of the capsule.

In establishing this new genus of Mosses, it is of importance to determine its more intimate affinities in the family to which it belongs. Its place is unquestionably between *Polytrichum* and *Dawsonia*; and it will I believe be admitted, that these three genera, in the natural method, cannot be separated; though they will necessarily form or be referable to distinct sections of an artificial system founded chiefly on modifications of the peristomium.

In attempting to discover characters by which this group of *Polytrichoidae* may be distinguished from other Mosses, it is in the first place necessary to determine the whole structure of *Polytrichum*; for this genus, though one of the most common of the
the order, and, from the great size of the capsules in many of its species, most readily admitting of accurate observation, has never yet been thoroughly examined.

One of the most striking characters of Polytrichum is the dense texture and consequent opacity of the leaves; in which it agrees with the other two genera of the section. This character, however, is not altogether confined to Polytrichoidae, and is wanting in Polytrichum undulatum and angustatum. But the lamellae of the upper surface of the leaves probably exist, though in very different degrees, in all the species of Polytrichum; are equally observable in Lyellia and Dawsonia; and I am not aware that they have been found in any other genera of the order.

These lamellae, which are represented in several of the species figured in English Botany, by Wahlenberg in P. laevigatum*, and since noticed by Messrs. Hooker and Taylor† as existing in nearly the whole of the genus, do not belong to the nerve only, as the authors of Muscologia Britannica seem to suppose, but in several species cover the greater part of the surface of the upper or spreading portion of the leaf; the sheathing base being either entirely destitute of them, or having them much less developed and strictly confined to the nerve.

In the form and position of the male flowers there is probably an absolute uniformity in the whole of this group: but the only peculiarities consist in the perigonial leaf or bractea being formed chiefly of the sheathing part of the stem-leaf; and in the new shoot proceeding from the centre of the star-like cluster. In P. undulatum, however, the former character is by no means obvious, and the latter is not perhaps constant; and both are only presumed to exist in Lyellia.

The double calyptra of Polytrichum, long considered as the essential

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essential character of the genus, equally exists in Dawsonia. But this outer or spurious calyptra, formed of densely matted hairs originating from the vaginula and the apex of the inner cucullate calyptra, is wanting in several species of Polytrichum, in some of which, and in Lyellia, the true calyptra is furnished with a few hairs only, either scattered over the whole of its surface, or confined to its apex; while in others, as in Polytrichum undulatum, it is nearly, and in P. magellanicum and laxigatum, entirely smooth.

Respecting the teeth of the peristomium of Polytrichum, I have very little to add, except that in P. magellanicum they appear to be eighty in number, which is a higher multiple of sixteen than has hitherto been noticed in this genus, and the greatest number that has yet been found in a single series in the order.

On the nature of the transverse membrane or tympanum of Polytrichum, I have formerly made some remarks in treating of Dawsonia, and have there considered it as the remains of the pulpy continuation of the columella, originally occupying the cavity of the operculum. But its uniform texture, as well as its exactly circular form and equal margin remain to be accounted for; unless this regularity may be supposed to depend on the circular, and apparently corresponding, aperture of the inner membrane.

Most authors have described the tympanum of Polytrichum as minutely perforated. These pores I have never been able to detect; but I observe in many cases an appearance which may perhaps account for the belief in their existence, namely, a minute reticulation on the outer surface of the membrane, apparently owing to the corresponding areolæ of the inner surface of the operculum, with which it was originally in contact.

Polytrichum is remarkable for the various forms of its capsule. Those species, indeed, in which it is quadrangular have been considered
considered as a distinct genus by Mons. de Beauvois. But unless this difference of external form should be found connected with others, either in the habit or in the internal structure, which I believe is not the case, it seems hardly sufficient to justify the subdivision of so natural a genus.

The symmetrical quadrangular capsule, admitting of a regular cylindrical inner membrane, is a character of inferior importance to the plano-convex or dimidiate capsule, which almost necessarily implies, and in *Dawsonia* and *Lyellia* at least is found to be connected with, a corresponding irregularity in the figure of the cavity; and hence I have introduced this remarkable form into the characters of both these genera.

On the structure of the inner membrane of the capsule in *Polytrichum* the only observation that I have met with occurs in *English Botany*, where, in the account of *Polytrichum subrotundum* (plate 1624), it is stated that Mr. James D. Sowerby has discovered, in this species as well as in *Polytrichum undulatum*, a real membranaceous peristomium within the teeth, which, according to Sir James Smith, "gives quite a new idea of the generic character."

This inner peristomium, if it may be so termed, which is well represented in the figure referred to, and consists of a horizontal projection of the inner membrane immediately below its apex, will, I believe, be found to exist in all the species of the genus, and in some cases reduces the aperture of the inner capsule to half the size of the outer at the origin of the teeth. It is always, however, quite entire, and, according to my observations, is formed of a doubling of the inner membrane, with a loose cellular or rather spongy substance interposed between the lamellæ.

Besides this transverse annular projection there are in the inner membrane of all the species of *Polytrichum* that I have examined, *P. undu-
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*P. undulatum* alone excepted, four longitudinal equidistant processes, extending from the aperture to the base of the capsule; and in many species projecting so far into its cavity as to come in contact either with the salient angles or sides of the columella, and consequently to subdivide it into a determinate number of cells.

The analogy of these longitudinal processes with the more numerous and irregular plicæ in *Dawsonia* and *Lyellia* is obvious; and I have not myself met with similar processes of the inner membrane in any other genus of mosses. They do not, however, afford an absolutely distinguishing character of this group, as they seem to be altogether wanting in *Polytrichum undulatum*; and Hedwig, it must be admitted, has represented an apparently analogous structure in *Gymnostomum pyriforme*.

The quadrangular or four-winged columella of *Polytrichum commune* is well figured and described by the accurate Schmidel; and I have found an equally regular form of this body in most of the species of *Polytrichum* that I have examined; though in many it is less evidently winged than in *P. commune* and the species nearly related to it.

Mons. de Beauvois seems to consider the alæ of the columella as themselves forming complete septa, and also that in this state they exist only in such species as have quadrangular capsules; for to these he limits his genus *Polytrichum*, distinguished by him from *Pogonatum* by its multilocular fruit. The cavity, however, is completely subdivided in several of the species with cylindrical capsules, as in *P. urnigerum*, and in a new species very nearly related to it (*P. microstomum*, nob.) lately received from Dr. Wallich: and the alæ of the columella, as far as

† Icones pl. p. 236. tab. 59. fig. 15.
I have observed, never form complete septa, at least in the ripe fruit; though in those species having quadrangular capsules they nearly reach the parietes opposite to the external angles, towards which they are directed.

As the columella of *Polytrichum* retains its regular form in the ripe capsule, its real structure may even then be in a great measure determined. In this stage I find its wings, or compressed sides, to consist of a double membrane with an intermediate spongy substance, in which there is no appearance of granules; and the internal denser substance of the axis is equally free from granular matter. But as there is no indication of lateral rupture, the sides in several species remaining perfectly smooth, nor of any central cavity, this structure affords a powerful argument in refutation of those hypotheses which assume the existence of two kinds of granules in the capsules of mosses; the one produced in the cavity formed by the internal membrane, the other in the substance or supposed cavity of the columella itself; the latter being considered as seeds in one of the hypotheses*, and in the other as pollen†.

This argument, however, is not here advanced to disprove the existence of two kinds of granules in the capsules of mosses, but merely against their production in the distinct cavities assigned to them in the hypotheses referred to.

In the greater number of *Polytricha* as well as in *Lyellia* and *Dawsonia* the seeds are extremely minute; a fact with which the increased surface for their production is probably connected: for in *P. undulatum*, where the seeds are larger than in most other species of the genus, this increased surface does not exist; and in *P. lavigatum*, where they are of still greater size, the plicæ of the inner membrane are probably also wanting.


Although
Although there is but little resemblance in the structure of the peristomium among the different genera of Polytrichioideae, they may still be said essentially to agree in the function of this part: for in all of them the complete separation of the seeds is ensured by the smallness of the apertures for their discharge. It may be remarked, that the necessity for this complete dispersion in Mosses seems to be inversely as the size of the seeds. For in those genera of the order in which the capsule either bursts irregularly or has a naked mouth, the seeds are in general larger than in those with a single, and still more manifestly than in those with a double, peristomium. And in conformity with this also, in Polytrichum undulatum and laxigatum the tympanum is sooner ruptured or removed than in the other species of the genus.

The result of this comparison of Polytrichum with Lyellia and Dawsonia, although it confirms the propriety of their approximation, does not afford any clearly distinguishing mark for the very natural section of the order which these three genera form. In the mean time, however, it may be circumscribed, though not with absolute precision, by a combination of the more general characters which have been now enumerated.

**LEPTOSTOMUM.**

In defining this genus, which was first proposed in my former paper on Mosses, I relied chiefly on the undivided annular projection of the inner membrane of the capsule. I was induced to employ this modification of the peristomium as a character, though certainly far from being obvious, in finding it to exist in several mosses of the southern hemisphere, having a similar and peculiar habit; and which, had it been neglected, I must have referred to Gymnostomum, with the greater number of whose species they have hardly any thing in common.
Mr. Hooker, however, has since found, as he states, the same structure in several other mosses, generally considered as having a naked peristomium, particularly in Gymnostomum microstomum, Griffithianum, and fasciculare; and as these species have but little resemblance to each other, and still less affinity to Leptostomum, he has reduced this genus also to Gymnostomum.

If the statement referred to be correct, Leptostomum, though it may be a natural genus, must be given up, until other marks shall be found by which it may be distinguished. I have not had specimens sufficiently perfect to enable me to judge of the structure of all the species of Gymnostomum mentioned by Mr. Hooker. In one of them, however, Gymnostomum microstomum, the peristomium is certainly very different from that of Leptostomum. In this species I find, on removing the operculum, that the mouth of the capsule is not only completely covered by a horizontal membrane, but that this covering is derived from the outer membrane of the capsule, and consequently differs in origin as well as in form from the peristomium which it has been said to resemble. Its central portion, however, being extremely thin is soon ruptured and deciduous, and in this state only it has been seen by the authors of the Muscologia Britannica.

Gymnostomum microstomum therefore may itself be considered as a distinct genus, to which the name of Hymenostomum* may be given; and it is worthy of remark, that in its technical character it approaches most nearly to Lyellia, though no two mosses differ more widely in almost every other respect.

*Hymenostomum.

Fl. Fem. terminalis.
Stoma edentulum, clausum epiphragmate (e membrana exteriore orto), disco tenuissimo (a columella libero) mox rupto et evanido; limbo persistenti horizontali indiviso.
Calyptra dimidiata, laevis.
Fl. Mas terminalis, gemmiformis.
From the account given of Gymnostomum Griffithianum it appears that this species also has in the early stage a membrane completely covering the mouth of the capsule. But this membrane probably differs in origin, at least, from that of Hymenostomum, as it seems to do both in form and dehiscence from the peristomium of Leptostomum.

Of Gymnostomum fasciculare I have examined only imperfect specimens, I cannot therefore speak with confidence of its structure. The annular process, however, mentioned by Mr. Hooker is more likely to be the remains of a complete horizontal covering, and probably originating from the inner membrane, than to resemble the peristomium either of Hymenostomum or Leptostomum. A membrane of this kind is certainly present in some species of Gymnostomum, and perhaps may be found in all those that really belong to that genus. It exists also in Weissia Templetoni, which so closely resembles Gymnostomum fasciculare as to be with difficulty distinguished from it, unless by the inspection of the peristomium; and, in addition to the erect annular peristomium from which the character of the genus is taken, I have observed a similar membrane in Leptostomum itself. It seems even to be not an uncommon process or termination of the inner membrane, though it has been remarked only in some of its more obvious and persistent modifications. Thus the spongy membrane figured and described in the two published species of Calymperes, seems to be an analogous structure*, as is also the circular disk terminating the capsule of the species of Calymperes; for, in the only species that I have examined, it is either entirely wanting, or firmly adheres to the inner surface of the operculum, along with which, also, a considerable portion of the columella separates. Nor has Swartz, who established the genus (in Spreng. Schrad. und Link Jahrb. der Gewäch. vol. i. p. 1.) even noticed this membrane in his description.

* The circular spongy membrane covering the mouth of the capsule certainly does not form an essential part of the character of Calymperes; for, in the only species that I have examined, it is either entirely wanting, or firmly adheres to the inner surface of the operculum, along with which, also, a considerable portion of the columella separates. Nor has Swartz, who established the genus (in Spreng. Schrad. und Link Jahrb. der Gewäch. vol. i. p. 1.) even noticed this membrane in his description.
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ing the columella in several species of Splachnum; and perhaps even the tympanum of Polytrichum may be of similar origin.

But these characters of Leptostomum and Hymenostomum, though they do not appear to have been yet observed in any other mosses, may still perhaps be considered too minute for generic distinctions: and it must be admitted that were nothing to be obtained but the subdivision of an extensive natural genus it could not be necessary to have recourse to them. The divisions in question, however, are certainly not of that kind.

The weakest part indeed of Hedwig's system is its bringing together all those mosses that have a naked peristomium, and even including the greater part of them in the genus Gymnostomum; while many of the species so associated are in real affinity much nearer to several other genera of the order having a simple or even a double peristomium.

Thus Gymnostomum microstomum, the Hymenostomum of the present paper, has less the habit of the genus in which it is placed than of Weissia, to some of whose species, especially W. affinis and trichodes, it seems to approach even in the structure of its peristomium.

Several species of that section of Gymnostomum, to which perhaps the genus should be limited, especially G. fasciculare, Bonplandii, and Rottleri, can hardly be distinguished from Weissia Templetoni*.

* Weissia Templetoni, along with a nearly related species found in New Holland, Funaria minor of Delile (Flor. Ægypt.), and perhaps also Weissia radians, may form a genus distinct from Weissia, and nearly related to Funaria, differing chiefly in the irregular bursting and evanesence of the inner peristomium, which in Funaria is regularly divided and generally persistent, though in some cases perhaps equally deciduous. In a variety of Weissia Templetoni, or a very nearly related species, collected in 1800 in the county of Donegal, I have observed the outer peristomium to be not unfrequently wanting, even before the separation of the operculum; a fact which, if hereafter confirmed, would establish its affinity to Gymnostomum fasciculare.

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Gymnostomum or Anictangium pulvinatum agrees in every other part of its structure with Grimmia.

Gymnostomum lapponicum, notwithstanding the difference of calyptra, may be considered as related to Grimmia Daviesii, and consequently to Orthotrichum, which G. Daviesii* resembles in its teeth being approximated in pairs.

Gymnostomum viridissimum has exactly the habit and calyptra of Zygodon.

Gymnostomum pennatum (Schistostega of Mohr,) in one remarkable character may be compared with Fissidens†.

Anictangium aquaticum is evidently related to Cinclidotus or Trichostomum.

Gymnostomum julaceum and Hedwigia secunda of Hooker resemble certain species of Pterygynandrum, Neckera and Leskia.

An unpublished moss (Glyphocarpa capensis) with a naked peristomium, which I observed on the Table Mountain of the Cape

* Griffithia Daviesii nob.
† As Schkuhr (in Krypt. Gewäch. ii. p. 31. t. 12.) has ascertained that the operculum of Gymnostomum pennatum separates entire, the genus Schistostega must be again reduced to Gymnostomum, until other distinguishing characters are discovered.

Its resemblance to Fissidens consists in the somewhat similar disposition of leaves.

In Fissidens, as limited by Bridel, (Muscol. Nov. p. 186) the leaves are universally described as presenting their margin instead of their disk to the stem, and as having a doubling of the lower half of their inner or upper margin, extending as far as the nerve.

On this view Bridel (in l. cit.) has formed a separate section of the order, consisting of Fissidens and Octodiceras; and hence also M. de la Pylaie has changed the name of Fissidens to Skitophyllum. (Journal de Botan. Appliq. iv. p. 133.) It seems to me a much simpler explanation of the apparent anomaly to consider the supposed doubling or division of the leaf as its true disk, and the deviation from the usual structure as consequently consisting in the greater compression of the leaf, and in the addition of a dorsal and terminal wing. In support of this view it may be observed, that in the lower leaves of the stem both the additional wings are greatly reduced in size, and in some cases entirely wanting, as they universally are in the perigonial leaves, which have likewise the more ordinary form, being moderately concave and not even navicular.
of Good Hope, has the spherical striated capsule as well as the inflorescence and ramification of *Bartramia*: and with this genus also *Anictangium Humboldtii* agrees in its capsule, though its habit is that of *Leskea* or *Hypnum*.

*Drepanophyllum* of Richard (*Dicranum? falcifolium* of Hooker,) in form and disposition of leaves is related to *Fissidens* and *Neckera*. *Calymperes* approaches to *Orthotrichum*, or rather, perhaps, to *Schlotheimia* or *Macromitrium*.

*Lyellia*, which belongs to the same division of the artificial system, is evidently allied to *Dawsonia* and *Polytrichum*.

And lastly, *Leptostomum*, the genus more particularly under consideration, appears to me most nearly related to *Bryum*; with which indeed its affinity would be completely established, were Hedwig’s account of the peristomium of *Bryum macrocarpum* proved to be correct.

To the observations now made on the various affinities of mosses which agree in having a naked peristomium, it may be added, that the genera with a simple peristomium do not form a strictly natural series, several of them being much more nearly related to those in which the peristomium is double than to each other.

But if the correctness of these statements be admitted, it follows that, in many cases to obtain natural genera in this order either additional sources of distinction must be sought for, or those at present in use more minutely investigated.

Of additional characters, which in some cases may be employed with advantage, I shall merely advert to the membranes of the capsule being distinct or contiguous, and to that more intimate union where there seems to be a single membrane only; to the modifications of internal structure of the inner membrane; the differences in form and duration of the columella, or even its being entirely wanting in the ripe capsule; the presence or absence
sence of the annulus; and the insertion, form and relative position of the male flowers, which, though always considered of importance by Hedwig, many of the most distinguished muscologists of the present day entirely exclude from the characters of their genera.

With respect to the principal source of generic distinctions, the Peristomium, in addition to the circumstances generally attended to, namely, the origin, number, direction, form, and actual division of the teeth, it may be of some importance to ascertain their aestivation, which, though very generally, is not always valvular: and especially to mark the existence or want of the longitudinal striae or semi-pellucid lines: for these, if they do not prove the compound nature, at least clearly indicate a tendency to division in the teeth where they are found; division being always in the course of the striae, and in no instance taking place unless where they are present.

But in considering them, which I am inclined to do, as proving composition or confluence of the teeth, it would appear that there is a much greater uniformity in the structure of the simple or outer peristomium, at least, than is generally admitted; and that the prevailing number of teeth in this series is thirty-two; though by a coalescence, more or less complete, they are frequently reduced to sixteen, in some cases to eight, and in a few even to four.

According to this view, a single longitudinal line in the axis of a tooth indicates the confluence of two teeth; three equidistant lines, one being central, the coalescence of four; and seven lines similarly disposed that of eight.

Nearly the whole of these modifications exist in that natural subdivision of the order, which may be named Splachnææ, consisting of Splachnum, Systylium, Tayloria, (Hookeria of Schwaegrichen,) Splachnum squarrosum of Hooker, and Weissia splachnoides.
The number of teeth in *Splachne* is thirty-two, which, however, are never entirely distinct and at the same time equidistant, but approximated or united in various degrees in the different genera and species of the section.

Thus in *Tayloria* and *Systylium* the thirty-two teeth are distinct and disposed in sixteen pairs.

In *Splachnum rubrum* and *luteum* there are apparently only eight pairs, each tooth, however, having a pellucid and obscurely-perforated axis. In almost all the other genuine species of *Splachnum* there is the same disposition as in *S. rubrum* and *luteum*; but the pellucid axis of each tooth is less distinct and imperforated.

In *Splachnum angustatum*, and I believe also in a second species nearly related to it, the arrangement is somewhat different; for the sixteen apparent teeth are approximated, and at the base even united in fours, the pellucid axis of each tooth being still less obvious. Hence these species in their peristomium very nearly approach to *Tetraphis*, to which they would be absolutely referable were the union complete.

In *Splachnum squarrosum* the apparent number of teeth is eight, without any actual subdivision. But as each tooth has three equidistant pellucid lines, of which the lateral are nearly as distinct as the central, there can be no doubt that the composition is the same here as in the rest of the section*.

By

* In a late number of *Musci Exotici*, (No. 17, tab. 136.) *Splachnum squarrosum* is transferred to *Octoblepharum*, and, on the authority of M. de Beauvois, is stated to be *Octoblepharum serratum* of Bridel. Mr. Hooker, however, continues to refer it to this genus, on the supposition of its agreeing with the original species in the form of its calyptra: observing that if this should prove not to be the case, it ought to be separated, under the generic name *Orthodon*, formerly given to it by its discoverer M. Bory de St. Vincent.

The calyptra of *O. albidum* is represented as distinctly cucullate, both by Swartz (in *Obs. Bot.* tab. xi. fig. 1.) and M. de Beauvois (in *Flore d'Oware*, i. tab. 31.). I have also observed
By these lines also *S. squarrosum* is readily distinguished from *Octoblepharum*, in which the apparent number of teeth is the same: for in *Octoblepharum* each tooth has only a single pellucid line; and hence its affinity to certain species at present referable to *Weissia*, with a nearly similar habit and sixteen distinct teeth, whose axis is not perceptibly pellucid.

*Weissia splachnoides* differs from the other *Splachneae* in having sixteen equidistant teeth; but as these teeth, according to the indication of the pellucid axis, are double, the arrangement may be compared with that of *Tayloria* and *Systylium*, in which the separation into thirty-two is complete, and the sixteen pairs equidistant. It agrees, however, also in this respect with *Grimmia* and with several species of *Weissia*: but in other important characters, as well as in habit, it is evidently related to *Splachnum*, and offers perhaps one of the best examples of the importance of the male flowers in distinguishing natural genera.

Even *Tetraphis pellucida* may be cited in proof of the same prevailing number in the peristomium; each of its four teeth, when highly magnified, appearing to have seven longitudinal striae, which, according to this test, would make the real number thirty-two; a structure contributing to fix the place of *Tetraphis* in the natural series between *Splachnum* and *Orthotrichum*.

observed it of the same form in specimens from Madagascar. There seems, therefore, no reason to doubt that these two mosses differ materially even in this part of their structure; and as other differences, of at least equal importance, also exist, both in the peristomium and male flowers, *Octoblepharum serratum*, whose habit is nearly that of *Splachnum*, may be distinguished both from that genus and from *Octoblepharum* by the following characters.

**ORTHODON.**

*Fl. Fem.* terminalis.

*Peristomium* simplex, octodentatum, dente singulo strisi tribus longitudinalibus instructo (ideoque e quatuor coalitis composito).

*Calyptra* mitriformis (4-fida, pilosa).

*Fl. Mas* terminalis, discoideus.
Better evidence on the same subject is afforded by *Trichostomum*, *Didymodon*, and *Leucodon*, in all of which the thirty-two teeth are distinct, though approximated in pairs; by the sixteen bifid teeth of *Dicranum* and *Fissidens*; and by the like number of teeth with a perforated axis in *Trematodon*, *Weissia nuda*, *Didymodon latifolium*, and several species of *Grimmia*.

In all the genera having a double peristomium I believe the pellucid axis more or less manifestly exists; but in these genera there is a great uniformity in the apparent number of teeth in the outer peristomium; there being no instance of actual division in this series beyond sixteen, or of a further approximation, unless in *Orthotrichum*, in several of whose species the approximation or even union of the double teeth by pairs takes place, while in a few others the sixteen teeth are slightly divided at the apex, and in the whole genus the pellucid axis is remarkably distinct.

The only exceptions to the actual division into thirty-two, or the structure indicating that number, in the simple peristomium of mosses, occur on the one hand in certain species of *Weissia*, perhaps in *Encalypta* and in *Octoblepharum*, in all of which, I believe, there is a reduction to sixteen: and on the other in *Polytrichum*, where the number is frequently increased, varying in the different species, and chiefly by multiples of sixteen, from thirty-two to eighty. In this genus also, whatever the number may be, the teeth never have a semipellucid, but rather an opake or thickened axis, and no tendency to union or even approximation is observable. The constant equidistance of the teeth in *Polytrichum* seems to be connected with its peculiar mode of dissemination; for as this takes place through the interstices of the teeth, and as complete separation of the seeds seems necessary on account of their extreme minuteness, a reduction in number and consequent increase of size of these apertures would probably,
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bly, in some degree, prevent dispersion, while the unequal distances of the teeth might either produce a deviation from the regular figure, or an early rupture, of the tympanum, which forms an essential part in this economy.

BUXBAUMIA.

In my former paper I have proposed to preserve the genus Buxbaumia, as established by Schmidel; and in constructing a character to comprehend both species, I entirely rejected the outer peristomium of Hedwig; and having also adopted his opinion respecting the middle peristomium of B. aphylla, which he has termed corona, and considered as analogous to the annulus in many other mosses, it became unnecessary to advert to this part in defining the genus.

Mr. Hooker has since published an excellent analysis of both species, and has followed Ehrhart and Mohr in regarding them as forming distinct genera.

This determination I have now no hesitation in adopting; for, whatever the nature of Hedwig's corona may be, it affords at least an obvious character, and is connected with other differences of sufficient importance to justify the separation; though the two genera must always remain in the same natural section of the order.

The observations that follow belong, therefore, solely to Buxbaumia aphylla.

My first remark on this plant relates to its peristomium, on the nature of which, as compared with that of other mosses, at least two different opinions may be formed.

According to one of these, the outer peristomium of Hooker may with Hedwig be considered analogous to the fimbria or annulus existing in many other mosses; and the principal objection
to this view would perhaps be obviated by rejecting the outer peristomium of Hedwig, as I have formerly proposed, and which Mr. Hooker has since done; as there would then be nothing either in the origin or texture of this part essentially at variance with the supposition; the principal remaining difference being its greater length; for the cilia of the peristomium of Buxbaumia may be compared with the striæ or divisions existing in the annulus, which seem to be equally determinate in number, and in some cases also disposed in a double series.

On the second supposition, the peristomium of Buxbaumia originating entirely from the outer membrane, may, though consisting of several and even of dissimilar series, be regarded as analogous to that portion of the pencil of Dawsonia which arises from the same part of the capsule. This analogy is suggested by Mr. Hooker, and is confirmed by a circumstance that he does not seem to have noticed, namely, that his outer peristomium, the corona of Hedwig, consists of a double series of cilia. The number of cilia in each series exceeds sixteen, but hardly amounts to thirty-two; it probably, however, corresponds with that of the plicæ in the membranaceous peristomium.

We have here then a passage from a number still perhaps definite, though disposed in a triple series, to the indefinite number peculiar to, and so striking in, Dawsonia.

My second observation relates to the inner membrane of the capsule, of which I find the mouth to be quite entire and open, though before the separation of the operculum it is closed by the terminating process of the columella. Hence Buxbaumia has some resemblance to Polytrichum, and a still greater to Lyellia, in this part of its structure.

Buxbaumia aphylla is the only moss considered as being entirely destitute of leaves; and though it has been oftener and more fully described
described than any other plant of the order, from the monographs of Linnaeus and Schmidel to the excellent illustration recently published by Mr. Hooker, there is no difference of opinion on this point. I have lately ascertained, however, that *Buxbaumia aphylla* is always furnished with perfect leaves, which more nearly resemble, both in texture and division, those of a *Jungermannia* than of any species of moss properly so called; and consequently are widely different from those of *Polytrichoidae*, to which this genus is in several respects related.

The leaves in the barren plant, where I first observed them, are lanceolate and but slightly divided. Those at the base of the female perichaetium are even broader than the former, but more deeply cut, both laterally and at top, into several capillary segments; while the leaves which proceed from the surface of the perichaetium are still more deeply divided, and their segments so much elongated that the minute foliaceous base has been universally overlooked, and the perichaetium consequently described as covered with hairs.
XXXVI. EXTRACTS FROM THE MINUTE-BOOK OF THE SOCIETY.

Mar. 18, READ an Extract of a Letter addressed to the Secretary from Sir John Jamison, F.L.S., dated at Regentville, New South Wales, September 10, 1816, as follows:

"I cannot avoid relating to you an extraordinary peculiarity which I have lately discovered in the Ornithorynchus paradoxus.—The male of this wonderful animal is provided with spurs on the hind feet or legs, like a cock. The spur is situated over a cyst of venemous fluid, and has a tube or cannula up its centre, through which the animal can, like a serpent, force the poison when it inflicts its wound. I wounded one with small shot; and on my overseer's taking it out of the water, it stuck its spurs into the palm and back of his right hand with such force, and retained them in with such strength, that they could not be withdrawn until it was killed. The hand instantly swelled to a prodigious bulk; and the inflammation having rapidly extended to his shoulder, he was in a few minutes threatened with locked-jaw, and exhibited all the symptoms of a person bitten by a venomous snake. The pain from the first was insupportable, and cold sweats and sickness of stomach took place so alarmingly, that I found it necessary, besides the external application of oil and vinegar, to administer large quantities of the volatile alkali with opium, which I really think preserved his life. He was obliged to keep his bed for several days, and did not recover the perfect use of his hand for nine weeks. This unexpected and
and extraordinary occurrence induced me to examine the spur of the animal; and on pressing it down on the leg the fluid squirted through the tube: but for what purpose Nature has so armed these animals is as yet unknown to me. The female is oviparous, and lives in burrows in the ground, so that it is seldom seen either on shore or in the water. The males are seen in numbers throughout our winter months only, floating and diving in all our large rivers; but they cannot continue long under water. I had one drowned by having been left during the night in a large tub of water. I have found no other substance in their stomachs than small fish and fry. They are very shy, and avoid the shot by diving and afterwards rising at a considerable distance."

Jan. 20. Mr. Lambert, V.P. communicated to the Society an extract of a letter from Don Jose Pavon of Madrid, one of the authors of the Flora Peruviana, stating that he and his companions Ruiz and Dombey had found the potatoe (Solanum tuberosum) growing wild in the environs of Lima, and fourteen leagues from thence on the coast of Peru, as well as in Chili; and that it is cultivated very abundantly in those countries by the Indians, who call it Papas.

Dr. Maton, V.P. communicated a letter from the Rev. Revett Sheppard, F.L.S., stating that on the first of this month he shot a fine specimen of the common heron (Ardea major), and that its feathers were covered with a powder of a light blue colour; but in what manner this powder is secreted, or whether it occurs in the winter season only, he has not been able to ascertain.

Feb. 17. The Secretary stated, that Mr. Robert Gee has communicated to the President a specimen of Salix cinerea, (Flor. Brit. 1063, Eng. Bot. 1897,) with androgynous catkins,
kins, nearly half the flowers in the upper part of the cat-
kin being male, and the rest female. It was found by
himself at Duckinfield near Stockport, in Cheshire.

April 7. Read a Letter addressed to the Secretary by the Rev.
Patrick Keith, F.L.S., of which the following is a copy:

DEAR SIR,
Bethersden, Ashford, Kent, March 30, 1818.

In my Paper on the subject of the Developement of
the Seminal Germ, published in the last volume* of the
Society's Transactions, I find that I have unhappily
exhibited an incorrect and imperfect representation of
Mr. T. A. Knight's hypothesis on the same subject. I
have said that "the grand defect of Mr. Knight's hypo-
thesis is, that it does not at all account for the ascent of
the plumelet;" a statement that proves to be erroneous;
since the fact is, that Mr. Knight's hypothesis does ac-
count for the ascent of the plumelet as well as for the
descent of the radicle, though the circumstance (I am
sorry to say) had completely escaped my recollection at
the time I wrote my Paper: not that I had merely
 glanced at Mr. Knight's hypothesis, and then, after a
long interval, undertaken a refutation of it from memory;
but that the notes which I did take from Mr. Knight's
Paper at the time I read and perused it, contained, by
some unaccountable oversight, nothing whatever on the
subject of the ascent of the plumelet: I am desirous,
therefore, that this declaration and admission of error on
my part should appear in the next volume of the Soci-
ety's Transactions, that the reparation which I now offer
to Mr. Knight may be commensurate, as much as pos-
sible, with the injury he has sustained. I am, &c.

P. KEITH.

To A. MacLeay, Esq.

* Page 252.

May 25.
May 25. Mr. James Dickson, F.L.S. presented a specimen of the Misseltoe, found by him on the 20th of this month growing upon an oak-tree about four miles from Maidstone, by the side of the Medway.

The President announced, that an extensive and valuable collection of Quadrupeds, Birds and Reptiles, made by Mr. George Caley in New South Wales, has been purchased by subscription by the following Members of the Society, and lodged in the Society’s Museum, viz.

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Nov. 3. Dr. Leach exhibited a new species of Guillemot, named by him *Uria Francsii*, discovered by Mr. Francs near Ferroe, and afterwards by Lieut. Parry, R. N. on the west coast of Greenland.

* For a description of this Bird, under the name of *Uria Brünnichii*, by Capt. Edward Sabine, see page 538.
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Continued from Page 426 of Vol. XI. of the Society's Transactions.

N.B. To Books which are Continuations of Works included in any of the former Parts of the Catalogue, the original Numbers are here affixed; and the other Books are numbered in regular progression.

816. Beck's (T. R.) Annual Address delivered by Appointment before the Society for the Promotion of useful Arts in the City of Albany. Albany, 1813, 8vo.
819. Bigelow's (J.) Account of the White Mountains of New Hampshire, 1816, 8vo.
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826. Burrows's (G. M.) Account of two Cases of Death from eating Mussels; with some general Observations on Fish Poison. London, 1815, 8vo.
828. Clinton's (De Witt) Discourse delivered before the Literary and Philosophical Society of New York on the 4th of May 1814. New York, 1815, 4to.
829. Elliot's (S.) Sketch of the Botany of South Carolina and Georgia, no. 1. Charleston, 1816, 8vo.
830. Fischer (G.) Zoognosia, ed. 3tia. vol. 1. Mosquae, 1813, 4to.
831. ———— Notice d'un Animal Fossile de Siberie. Moscou, 1809, 4to.
834. ———— Prodromus Craniologiae Comparatæ. Mosquae, 1811, fol.
835. ———— Essai sur la Turquoise et sur la Calaite. Moscou, 1816, 8vo.
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862. Heyne's
862. Heyne's (B.) Tracts Historical and Statistical on India. London, 1814, 4to.
863. Lamouroux (J. V.) Essai sur les Genres de la Famille des Thalassiophytes non articulées. Paris, 1813, 4to.
865. ——— A general Notice of the Animals taken by Mr. John Cranch during the Expedition to explore the Source of the River Zaire. London, 1818, 4to.
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877. ——— Sketch of the Economy of Man. Ludlow, 1819, 8vo.
884. Rootsey's (S.) General Dispensatory. Bristol, 1815, 12mo.
885. ——— Syllabus of a Course of Botanical Lectures. Bristol, 1818, 12mo.

891. ——— Observationes in varias Trifoliorum Species. Florentiae, 1810, 8vo.


896. Smith (J. E.) Compendium Florae Britannicae. Londini, 1816, 12mo.


900. Spafford's
901. Spurzheim's (J. G.) Examination of the Objections made in Britain against the Doctrines of Gall and Spurzheim. Edinburgh, 1817, 8vo.
905. Temminck (C. J.) Manuel d'Ornithologie, ou Tableau Systematique des Oiseaux qui se trouvent en Europe. Amsterdam, 1815, 8vo.
908. ———— Mémoire sur le Cactus Opuntia. Paris, 1813, 8vo.
909. ———— Coup d'Œil Historique, Agricole, Botanique et Pittoresque sur le Monte Cirello. Paris, 1814, 8vo.
912. ———— Phosphorescentia Maris. Genua, 1805, 4to.
922. Me-


924. Pharmacopoeia Collegii Regalis Medicorum Londinensis. Londini, 1809, 4to.

925. The American Medical and Philosophical Register, 2d ed., 4 vols. New York, 1814, 8vo.


927. Exposition publique de la Société Royale d'Agriculture et de Botanique de la Ville de Gand, Février, 1818. Gand, 1818, 8vo.

928. Report of a Committee of the Linnean Society of New England relative to a large marine Animal supposed to be a Serpent. Boston, 1817, 8vo.


931. Travels in Louisiana and the Floridas in the Year 1802; translated from the French with Notes by John Davis. New York, 1806, 8vo.
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Continued from Page 430 of Vol. XI. of the Society's Transactions.

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<td>Tofeldia stenopetala &amp; glutinosa</td>
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<td>10.</td>
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<td>11.</td>
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<td>12.</td>
<td>cirrhata &amp; nebulosa</td>
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<td>13.</td>
<td>constrictor &amp; venustula</td>
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<td>14.</td>
<td>Sabia lanceolata</td>
<td>355</td>
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<td>15.</td>
<td>Strychnos axillaris</td>
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<td>15.*</td>
<td>Dischidia bengalensis</td>
<td>357</td>
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<tr>
<td>16.</td>
<td>Tylophora exilis</td>
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<td>17.</td>
<td>Macrolobium bijugum</td>
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<td>18.</td>
<td>Pygeum acuminatum</td>
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<td>20.</td>
<td>Rhizomorpha medullaris</td>
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<tr>
<td>21.</td>
<td>Pelicium cyanipes, Anelastes Drurii, &amp;c.</td>
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<td>22.</td>
<td>Eurynotus muricatus, Adelium calosomoides, &amp;c.</td>
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<td>23.</td>
<td>Buprestis cruentata, B. phæorhea, &amp;c.</td>
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<td>24.</td>
<td>Chætodon monodactylus</td>
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<td>25.</td>
<td>Perca antarctica</td>
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<td>26.</td>
<td>Callionymus diacanthus</td>
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</table>
Directions for placing the Plates of the Twelfth Volume.

TAB. 27. Labrus ornatus - - - - to face page 502
28. Fossil Terebratulae - - - - - - 516
29. Larus Sabini - - - - - - 522
30. Tracheæ of Anas spectabilis, mollissima and glacialis - 554

The Binder is requested to observe, that as a general Title-page and a Table of Contents for the whole Volume are now given, the Title-pages to the separate Parts, and the Table of Contents for Part I., are to be cancelled.

END OF THE TWELFTH VOLUME.

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ERRATA.

Page 294, line 17, (and throughout Mr. Bicheno’s Paper on Juncus,) for Coruncula read Caruncula.

and for Coruncula read Caruncula.

315, line 9, for Wahlenburg read Wahlenberg.

357, after line 8, insert Tab. XV i*.

399, line 10, for brevisus read laetus.

415, line 16, for subcinerea read subcinereus,

and for obscura read obscurus.

429, line 1, dele Pl. XXII. fig. 8.

— after line 20, insert Pl. XXII. fig. 9.

537, line 1, for Groelandica read Groenlandica.

ERRATA IN THE PLATES.

Tab. 9, for Perisperm read Caruncula.

21, fig. 8, letter k wanting, to point out terms.

23, fig. 13, letters a, b wanting, to indicate front and antennae.