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THE TRANSACTIONS OF THE LINNEAN SOCIETY OF LONDON.

VOLUME XV.

LONDON:

PRINTED BY RICHARD TAYLOR, RED LION COURT, FLEET STREET:

SOLD AT THE SOCIETY'S HOUSE, SOHO-SQUARE;

AND BY LONGMAN, REES, ORME, BROWN, AND GREEN, PATERNOSTER-ROW;

AND WILLIAM WOOD, STRAND.

MDCCCXXVII.

MISSOURI
BOTANICAL
GARDEN.

THE

TRANSACTIONS

OF

THE LINNEAN SOCIETY

OF

LONDON.

VOLUME XV.
PART THE FIRST.

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CONTENTS.

PART I.

I. *A Catalogue of the Norfolk and Suffolk Birds; with Remarks. By the Rev.* Revett Sheppard, *A.M. F.L.S. and the Rev.* William Whitear, *A.M. F.L.S.* p. 1

II. *On the Structure of the Tarsus in the Tetramerous and Trimerous Coleoptera of the French Entomologists. By* W. S. MacLeay, *Esq. A.M. F.L.S. Communicated by the Zoological Club of the Linnean Society* - p. 63

III. *Notice on a peculiar Property of a Species of Echinus. By* E. T. Bennett, *Esq. F.L.S. Communicated by the Zoological Club of the Linnean Society* - - p. 74

IV. *A Commentary on the Third Part of the Hortus Malabaricus. By* Francis Hamilton, *M.D. F.R.S. and F.L.S.* - - - - - - - p. 78

V. *Observations on the Crepitaculum and the Foramina in the anterior Tibiæ of some Orthopterous Insects. By the Rev.* Lansdown Guilding, *B.A. F.L.S.* - p. 153

VI. *De-*

VI. *Description of the* Plectrophanes Lapponica; *a Species lately discovered in the British Islands. By* Prideaux John Selby, *Esq. F.L.S. Communicated by the Zoological Club of the Linnean Society* - - p. 156

VII. *Description of a new Genus of the Class Mammalia, from the Himalaya Chain of Hills between Nepaul and the Snowy Mountains. By Major-General* Hardwicke, *F.R.S. and F.L.S.* - - - - - p. 161

VIII. *Description of two new Birds from Nepaul. By Major-General* Hardwicke, *F.R.S. and F.L.S.* - p. 166

IX. *A Description of the Australian Birds in the Collection of the Linnean Society; with an Attempt at Arranging them according to their natural Affinities. By* N. A. Vigors, *Esq., M.A., F.R.S. F.L.S. and F.G.S., and* Thomas Horsfield, *M.D., F.L.S. and F.G.S. Communicated by the Zoological Club of the Linnean Society* p. 170

X. *Notice of a Species of Ursus from Nepaul. By* Thomas Horsfield, *M.D. F.L.S.* - - - - p. 332

TRANS-

TRANSACTIONS

OF

THE LINNEAN SOCIETY.

I. *A Catalogue of the Norfolk and Suffolk Birds; with Remarks. By the Rev. Revett Sheppard, A.M. F.L.S. and the Rev. William Whitear, A.M. F.L.S.*

Read April 20, 1824, *and May* 3, 1825.

THE proximity of the counties of Norfolk and Suffolk to the northern part of the Continent, affords an opportunity to many migrative species of birds to visit these parts of the kingdom, in their passage to and from their breeding haunts. The abundance of food which the sea-coasts, rivers, and marshes supply to the waders and web-footed birds forms an attraction to these tribes. Hence this district is particularly favourable to the pursuits of ornithologists. The following paper has been drawn up with a view to facilitate such pursuits, and to illustrate the history of several species of birds. Its object will be sufficiently answered if this end shall be in any degree accomplished; and, at the same time, some light thrown upon the wisdom and goodness of the Author of Nature in the works of his creation.

The classification and names adopted are those of the second edition of Temminck's *Manuel d'Ornithologie*, a work which

evinces in its author a more extensive and accurate acquaintance with the birds of Europe, than any other that has been hitherto published.

Genus I. FALCO.

1. *F. Islandicus* (Jerfalcon).

Several years since, a beautiful specimen of the Jerfalcon was shot on Bungay common; and being only slightly wounded in the pinion, it lived for some time in the possession of John Cooper, Esq. of that place.

2. *F. peregrinus* (Peregrine Falcon).

Mr. Hoy, of Higham in Suffolk, trapped two of these birds, and has seen others at that place. He catches them by fastening baited steel traps, covered with moss, on the top of a high tree, upon which he has observed them to be fond of perching.

The Peregrine Falcon visits the warren at Beechamwell, on the estate of John Motteux, Esq., in autumn, and continues there during the winter. A pair of these birds bred many years successively in the cliffs at Hunstanton in Norfolk, though constantly deprived of their young, which were taken and trained to falconry by Mr. Downes of Gunton; but during the three last years they have ceased to build there.

3. *F. Subbuteo* (Hobby).

4. *F. Æsalon* (Merlin).

5. *F. Tinnunculus* (Kestril, Wind-hover, Hover Hawk).

The stomach of a Kestril killed late in the year was filled with grubs.

The Rev. Joseph Harrison has employed with success the following method of taking the Kestril.—A white napkin was spread

spread in a meadow, and fastened at the corners with little hooked sticks. On the middle of the napkin a live sparrow was fixed by means of a string three or four inches in length. Slender twigs were stuck up on both sides the cloth, to prevent the Hawk from attacking the sparrow on either side. Two long slender twigs of weeping-willow, well covered with birdlime, were stuck in the ground, one at each end of the napkin, both forming an arch over the bird, but at such a distance that the sparrow could not touch them with its wings whilst fluttering; neither could any Hawk reach the sparrow without coming in contact with the limed twigs. The intention of the white cloth was to attract the attention of the Hawk at a greater distance to the sparrow fluttering upon it. The limed twigs were stuck so slightly in the ground, that if the Hawk, upon finding himself entangled, should struggle, they would have gone off with him and prevented his flight. Mr. H. observes, that twigs covered with birdlime, when long and slender, will stop the flight of the strongest bird, if fixed so as to pass off with him, when touched by his plumage; for they then become like a chain binding the wings to the body. By these twigs he has caught the Cuckoo, Pigeon, &c., and has no doubt but that the Eagle, and every bird of prey, might be taken by them when their nests or haunts are discovered.

The disposition of the Kestril is bold and familiar. Immediately upon the capture of one by the above method, Mr. Harrison placed him upon a table, and gave him the sparrow which he had killed when taken: he plucked and ate it in his presence, showing no more dread than if he had been brought up tame. After capturing three of these birds, Mr. H. made no further attempts upon them, as he considers them to be of great benefit to the farmer, and doing very little injury to the sportsman.

A Hawk of this kind was observed to dart upon a weasel, and immediately to mount aloft with it in his talons; but had not proceeded far before both fell from a considerable height: the weasel ran off; but the Kestril, upon examination, was found to have been killed by a bite in the throat.

6. *F. fulvus* (Golden Eagle).

An account of a bird of this species, killed in Suffolk, may be seen in Pennant's *British Zoology*, edit. 1812.

7. *F. Haliaëtus* (Osprey).

The Osprey has been met with in the neighbourhood of rivers and large pieces of water, both in Norfolk and Suffolk. A very fine specimen, which we saw in the possession of Mr. Crickmore of Beccles, had a beautiful bronze gloss upon the upper parts of its plumage.

8. *F. Albicilla* (Sea Eagle).

Some years since a Sea Eagle was met with in the western part of Norfolk, and being only slightly wounded with a gun was with difficulty overpowered. It afterwards lived sixteen years in the possession of the late Henry Styleman, Esq. of Snettisham, at whose house we saw it in full vigour in the year 1818. Another bird of the same species in full plumage, killed in Norfolk a few years ago, was sent to Mr. Hunt of Norwich. In its young state,—the Sea-Eagle of most English authors,—it has been frequently shot both in Norfolk and Suffolk.

A young one, which is kept by the Rev. Joseph Harrison of Great Oakley in Essex, and is very familiar with him, and which he procured when about ten weeks old from Sweden, sounds an alarm upon the approach of any strangers, and will fly violently

to

to attack them if they approach too near: he has, however, a little of the coward about him, as this is generally done when their backs are towards him. We saw his manner of devouring a large puppy. He ate the whole of the head, and then from the neck picked out the remainder of the bones and flesh, dexterously turning the skin inside out as he proceeded. His note at first a good deal resembled that of the Raven; at present it is more like that of the Great black-backed Gull.

9. *F. Nisus* (Sparrow-Hawk).

We have been favoured by Mr. Harrison with the following observations upon this species.—"This bird may be taken in a similar manner to that described for taking the Kestril,—by limed twigs and a sparrow. His disposition, however, appears much more shy and fearful of the human species than that of the other. I made an experiment to tame one last summer. He was brought to me whilst very young, and every possible care was taken to gain his attachment; but this proved of no avail: he was fierce, savage and fearful, and without any attachment to those who fed him. His wing was cut, to prevent him from preying upon living birds. When oppressed with hunger he would come upon my arm, if I approached him and showed him either bird, mouse, or flesh of any kind, but would not long remain unless he had something given him. He had a stand in the garden, where he was regularly fed whilst young; but when he became capable of flying to a distance, he would not remain there to eat what was placed upon it, unless it was fastened by a string or wire; and even then he would leave it on the appearance of any of the domestics who had been in the habit of feeding him, or of any animal. When I gently approached him myself, at the same time calling to him, he would sometimes remain. His favourite abode was in a meadow near the house,

perched

perched on a rail by the side of a brook, where he would sit almost from morning to night, calling to me at all times when I made my appearance.

"I found, after two months' experience, that no discipline or attention could gain his affections. Both this bird and the Kestril seem fond of washing themselves in hot weather, and of basking and rubbing themselves in dust and ashes."

10. *F. Milvus* (Kite).

11. *F. Buteo* (Buzzard).

12. *F. lagopus* (Rough-legged Falcon).

We are informed by Mr. Scales of Beechamwell, near Swaffham, that this bird annually visits the warren at that place about the month of November, and continues there for some time in quest of rabbits. A fine bird of this species, which Mr. S. kept alive many months, is now preserved in the British Museum. Not long since, a pair of Rough-legged Falcons were killed at Holkham; and we have heard of one which was shot at Butley in Suffolk.

13. *F. apivorus* (Honey Buzzard).

A dark-coloured specimen of this bird was killed near Yarmouth, and is now in the beautiful and extensive collection of British birds belonging to Joseph Sabine, Esq.

14. *F. rufus* (Moor Buzzard).

These birds breed in some of the marshes of Norfolk. They devour the eggs of wild ducks which frequent the same places, and have been caught in steel traps baited with a duck's egg.

15. *F. cy-*

15. *F. cyaneus* (Henharrier).

This bird breeds in the channel-fen at Barton in Norfolk, where we have more than once thought ourselves in danger of being attacked by it, when we had approached the place where undoubtedly its nest was concealed.

Genus II. Strix.

1. *S. Nyctea* (Snowy Owl).

A female Snowy Owl was shot at Felbrigg in Norfolk the first week in April 1814, the weight of which was $5\frac{1}{4}$ pounds; length 2 feet; breadth 5 feet 4 inches. This is the first instance we have heard of the Snowy Owl being seen in England. In the month of January 1820 another specimen of the same bird was killed near Gunton, not many miles distant from the spot where the former one was found. The latter bird is now in the possession of Lord Suffield.

2. *S. Aluco* (Brown Owl).

3. *S. flammea* (White Owl).

This bird, as well as others of the genus, is destructive among rabbits, as we have been informed by a relative, who has shot it in the very act of striking them on a warren; and we have ourselves frequently seen White Owls skimming over the burrows.

4. *S. brachyotos* (Short-eared Owl).

These Owls visit this part of the kingdom in September and October, and remain till the spring. They arrive in flocks of from ten to twenty, and frequent heaths; in which respect they differ from the Long-eared species, which is fond of the gloom of fir-plantations. Montagu says, that the ears in a dead specimen are not discoverable; but in one which we have seen, the ears

remained

remained distinct from the rest of the plumage after the bird was killed,—dead or alive there was no difference.

5. *S. Otus* (Long-eared Owl).

A pair of Long-eared Owls bred a few years since in Stavender-park near Orford. There were five young ones in the nest, one of which was kept alive for four years. It is said to be common near Beccles, and to breed in that neighbourhood. A female of this species, which we killed on the 13th of March, was not so beautiful as a male killed the beginning of the same month. We have seen seven of these birds together, and on being disturbed they would take their flight high in the air, where they resembled Hawks.

Genus III. CORVUS.

1. *C. Corax* (Raven).

In October 1812 we had an opportunity of observing the great superiority of the Crow over the Raven, although the latter is by much the larger bird. From a tree, whence we had noticed an uncommon chattering and clamour to proceed, three Ravens issued successively, and were instantly attacked and driven off with the greatest impetuosity by a Crow, which had been seated on the same tree with them. The antipathy, indeed, these birds bear to each other is very strong, as we have more than once had an opportunity of noticing. During the breeding-season we have seen a single Rook attack and drive away a Raven which had approached its nest, the Rook uttering at the same time a very angry note. Yet the Raven, when impelled by the force of affection for its young, may be superior to the Rook, as appears by the instance recorded by Mr. Markwick, of a pair of Ravens, which had a nest at Broomham in Sussex, causing the

the Rooks to desert a rookery in the same grove, which they had previously frequented for many years.

2. *C. Corone* (Crow).

We have often been much amused with the sagacious instinct of this bird, and of others of the same genus, in getting at their prey. In the winter season they frequent the sea-shores during the ebb tide in search of muscles and other shell-fish. As soon as the bird has found one, it flies up almost perpendicularly into the air, with the fish in its beak, and lets it fall on the stones in order to break its shell. The bird quickly follows the falling booty, and devours it.

The eggs of the Crow are subject to vary both in shape and colour. Two of them in our possession, taken from the same nest, differ considerably; one being of a pale green with very few small spots, and the other almost entirely covered with large dusky spots.

3. *C. Cornix* (Hooded Crow).

The Hooded Crow made its appearance in this country in the year 1816 as early as October 9th. They are very common in Suffolk on heaths. Sometimes they will approach the habitations of man, and feed upon the carrion preserved for dogs. This species is rather numerous in the neighbourhood of Yarmouth during the winter, feeding among the ooze at low-water; it is also frequently seen on the road between that place and Norwich.

4. *C. frugilegus* (Rook).

The eggs of the Rook are very good to eat, and by some persons have been thought equal to those of the Lapwing. Like those of the Crow, they are sometimes seen of a pale green,

with scarcely any spots upon them. We have seen two instances of a variety of this bird, in which the upper mandible was about an inch longer than the under one. Mr. Harrison has put Rooks' eggs into the nest of a Magpie, and the young Rooks have been reared by that bird. He says, that he has known this plan adopted with success by those who wished to have a rookery. The same gentleman has had Thrushes reared by a Hedge-sparrow, but in that case he usually assisted the old birds in feeding them.

5. *C. Monedula* (Jackdaw, Cadaw).

We have seen a flock of these birds busily employed in picking acorns from an oak. They used formerly to breed in hollow trees in the park at Ash in Suffolk. Their eggs, as well as those of Rooks, are very good to eat.

6. *C. Pica* (Magpie).

The sons of Mr. Lord of Ramsey, Essex, took four young Ravens from a nest, and put them into a waggon in a cart-shed. About the same time they destroyed the young of a Magpie, which had its nest near the cart-shed, and the old Magpies, hearing the young Ravens crying for food, carried them some, and constantly fed them till they were disposed of by the boys.

7. *C. glandarius* (Jay).

Some years since, as two gentlemen were sporting at Tunstal in Suffolk, distant about five miles from the sea, they observed an extraordinary flight of Jays, passing in a single line from seaward towards the interior. This line extended further than the eye could reach, and must have consisted of some thousands. Several of them were killed as they passed. But the firing at them did not occasion the rest to deviate from their line of flight.

This

This circumstance shows that they were then migrating, and it seems highly probable that they came from the Continent.

Genus IV. Bombycivora.

1. *B. garrula* (Waxen Chatterer).

The Waxen Chatterer, though only an occasional visitant, has not unfrequently made its appearance in these counties, and generally from November to March. Some years since a prodigious flock of them were seen in a grove at Bawdsey in Suffolk, by W. W. Page, Esq., then resident at that place. Mr. Leathes informs us that these birds were in considerable abundance at Herringfleet in the winter of 1810.

Genus V. Coracias.

1. *C. garrula* (Roller).

"In the month of May 1811, Sir Thomas Gooch's keeper shot a female Roller near Benacre in Suffolk, on the same spot where he had killed the male four years since: the ground they frequented was a coarse sort of heath and fen intermixed."—*Brit. Zool.* edit. 1812. In answer to some queries respecting a Roller killed in Suffolk, Mr. Hunt of Norwich replies, "The specimen of the Roller, which was shot at Bungay September 23, 1817, I suspect was a young male bird, as it differs materially in plumage from a female one now in my possession. This bird is now in the collection of Joseph Sabine, Esq. I am also credibly informed, that another specimen of the same bird was killed in the neighbourhood of Yarmouth about the same time. A few years since a Roller was shot at Bromeswell in Suffolk. And late in the spring of 1818 another was killed in the neighbourhood of Cromer."

Genus VI. ORIOLUS.

1. *O. Galbula* (Golden Oriole).

The late John Sheppard, Esq., of Campsey Ash, shot a female bird of this species at that place. Three others (two males and a female) were killed a few years since at Saxmundham. And we have been informed that a pair of these birds built a nest in the garden of the Rev. Mr. Lucas, of Ormsby in Norfolk. One of those mentioned above was killed in the spring.

Genus VII. STURNUS.

1. *S. vulgaris* (Starling).

The Starling was formerly seen in Suffolk in much greater flocks than at present, it being now a rare thing to see more than two hundred together; whereas formerly many thousands might be found congregated in the same flock. Very large flocks of Starlings are still sometimes seen in the marshes of Norfolk.

Genus VIII. PASTOR.

1. *P. roseus* (Rose-coloured Thrush).

This species has been four times noticed in Suffolk in the course of a few years. One was shot upon a cherry-tree at Chelmondiston, and being only winged, was fed with raw meat, and kept alive three months; another was also feeding upon cherries at the time it was killed at Polstead in the summer of 1818; a third was met with at Winston near Debenham; and a fourth, which was a beautiful specimen, was shot at Beccles towards the latter end of the summer. About the same time one was killed in the neighbourhood of Yarmouth.

Genus IX. Lanius.

1. *L. Excubitor* (Great Cinereous Shrike).

The migrations of this species are uncertain. It has been killed in Suffolk in the months of January, April, May, and September. And on the 9th of July 1816 we saw a female Cinereous Shrike at Baytham in that county, which made a noise like that of a pair of shears clipping a fence. We are informed by the Rev. George Reading Leathes, that this bird has been frequently seen in the Hyde near Bury (a large wood on the estate of Sir Thomas Gage), and that he has received a specimen shot there. In the autumn of 1819 four of these birds were sent to Mr. Hunt, which had been killed in Norfolk. Early in December 1819 a Cinereous Shrike frequented a thick thorn hedge, near Mr. Hoy's house at Higham, but was so shy that it could not be approached within gun-shot. On examining the hedge Mr. Hoy found three frogs, and as many mice, spitted on the thorns. He therefore set six very small steel traps, each baited with a mouse. On the following day two of the traps were found sprung, and the baits gone. By watching in concealment Mr. H. soon afterwards observed the Shrike to dart down upon a bait, and rise perpendicularly, but not quick enough to escape, as it was caught by two of its toes. The bird was carried alive to the house, and placed in a room in which a thorn bush was fixed, and some mice given to it: one of which it was observed through a hole to spit upon a thorn with the greatest quickness and adroitness.

2. *L. Collurio* (Red-backed Shrike).

A nest of this bird, built at Offton, was composed of dried grass and green moss, with a few small twigs of the *Clematis vitalba*, and lined with fibres. The eggs of the Red-backed Shrike,

Shrike, like those of many other birds, are subject to some variation. The ground of them is sometimes blueish-white, sometimes yellowish-white, and the spots are much larger and more numerous upon some than upon others. The beak of one of these birds which we shot, was coated over with cow-dung, doubtless from its having been searching therein for insects. We once saw a male Red-backed Shrike eager in chase of a Blackbird. We have heard a bird of this kind exactly imitate the cry of a young Owl; but are at a loss to conjecture its object, as it cannot be supposed to have done so with a view of decoying birds of that sort within its reach.

Genus X. MUSCICAPA.

1. *M. Grisola* (Spotted Flycatcher, Wall-bird).

The plumage of the young is very different from that of the old birds, being all over spotted.

The form of the Spotted Flycatcher is altogether adapted for activity of wing: its legs are very short; its breast broad: the bird narrows rapidly from breast to tail; and it has great length of wing in proportion to its size.

A Spotted Flycatcher was once observed by us to alight upon a rail with a large white butterfly in its mouth, which it swallowed whole, wings as well as body; whereas a tame Brambling, which has often butterflies given to it, uniformly rejects the wings. Having one evening let fly a large specimen of the *Lucanus Cervus*, it was immediately caught by a Spotted Flycatcher. This bird is known in Norfolk and Suffolk by the name of Wall-bird, from the circumstance of its frequently making its nest in a tree against a wall.

2. *M. albicollis* (Pied Flycatcher).

We have seen a specimen of this bird, which was killed near Cromer.

Cromer. Two others were caught by Mr. Downes in his garden at Gunton in Suffolk; and a fourth was shot at Keswick near Norwich.

Genus XI. Turdus.

1. *T. viscivorus* (Missel Thrush).

The Missel Thrush sings its loud note till the beginning of May, after which time it is not often heard. We have once, and only once, heard it run through a great variety of the most melodious notes, at a time when the male was wooing the female. The young have somewhat the appearance of hawks. The old birds are very fierce, and make a noise like a watchman's rattle. We have witnessed a similar affray between a pair of these birds and some magpies to that mentioned in White's *History of Selborne*. After the loss of their brood, the old birds used from time to time to make a noise like a magpie.

2. *T. pilaris* (Fieldfare, Meslin-Bird).

In backward seasons the Fieldfare is late before it leaves this country: it has been killed in the neighbourhood of Cromer the first week in June. The bird had then more dark spots upon the breast and sides than one which was killed in autumn, and the spots upon the first part were of a deeper hue. A specimen shot at this season of the year is in the museum of Joseph Sabine, Esq. On the 5th of May 1812, we saw Fieldfares in prodigious numbers, flying very high and steering due north. They were probably migrating at that time, as none were afterwards seen. We observed a very large flock of these birds on the 3rd of May 1820: they were extremely tame, and suffered us to approach within a few yards. They were observed again on the following day in the morning, but were all gone in the afternoon.

3. *T. mu-*

3. *T. musicus* (Song Thrush).

4. *T. iliacus* (Red-wing Thrush, Storm Bird).

5. *T. torquatus* (Ring-Ouzel).

The Ring-Ouzel has been met with in this part of the kingdom at various seasons of the year; but it appears to be most common in October, at which time we have seen twenty of them together. The Rev. G. R. Leathes says, "About the year 1804, a pair of these birds built in a garden at Lowestoffe, and laid eggs." When on the wing, the Ring-Ouzel makes a noise like that caused by the striking of two large stones. Its flight more resembles that of the Fieldfare than that of the Blackbird.

6. *T. Merula* (Blackbird).

Genus XII. CINCLUS.

1. *C. aquaticus* (Water Ouzel).

A few of these birds have been killed in this part of the kingdom.

Genus XIII. SYLVIA.

1. *S. Locustella* (Grasshopper Warbler).

We have met with this species both in Norfolk and Suffolk. Montagu does not mention, as Bewick has done, the spots upon the throat and neck. Its plumage is very glossy, having a silvery tinge upon it, particularly the under part. It very much resembles a Lark in its general figure, but the hind claw is not long enough for it to rank in that genus.

On the 15th of May 1820, a nest of the Grasshopper Warbler was found among some high grass, in a wood in the parish of Stoke by Nayland, in which were six eggs. The old male bird

was

was killed upon the nest. The structure of this nest resembled that described by Montagu, but the eggs were different from those found by him. They were white, with numerous small purplish-red spots. The nest was artfully concealed, having the long grass drawn over the top; and a hole was made in the grass, as if cut with a pair of scissors, forming a path for the bird to escape. Two other birds of this species were killed at the same time, and several others were heard. They were observed to frequent that part of the wood where the grass was high and the trees low.

2. *S. Phragmites* (Sedge Warbler, Reed-bird).

The legs and feet of the Sedge Warbler are remarkably large in proportion to the size of the body; the bill is also larger than is usual in birds of this genus. The disproportion of these parts has been noticed by Ray and White, but seems not to have been remarked by other authors. In a specimen which we killed, the legs as far as the toes were covered with an epidermis, which might easily have been pulled off. The under part of the toes is yellow. The base of the hind toe very stout and broad, doubtless to give it a firm grasp, the bird living chiefly in sedges and bushes hanging over the water. The wings are very short, compared with the length of the body. Its shape is altogether well calculated for making its way through the close coverts which it frequents. The Sedge Warbler will sometimes begin its song exactly like that of the Swallow; it will fly into the air singing, and come down with its wings turned up in the manner of the Lesser Field Lark, which may perhaps account for its having been called Willow Lark.

3. *S. arundinacea* (Reed Wren).

The Reed Wren frequents the reeds in the river Gipping, and

we have seen it at Higham: it is also found in other parts of these counties. A bird, which appears to be a variety of this species, was shot about the middle of May by the Rev. James Brown of Norwich, in the marshes below that city. This bird has no *vibrissæ*.

4. *S. Luscinia* (Nightingale).

5. *S. Atricapilla* (Black-cap).

The Black-cap may with propriety be called the English Mocking-bird. We have heard it sing the notes of the Blackbird, Thrush, Nightingale, Redstart, and Sedge Warbler; and besides its own peculiar whistle, which is most delightful, it frequently makes a noise resembling that of a pair of shears used in clipping a fence, which also is the noise made by the young of this species. During the period of incubation the male Black-cap occasionally sits on the eggs in the absence of the female.

6. *S. hortensis* (Greater Pettychaps).

This species of warbler has been found in the neighbourhood of Ipswich, and we have received its eggs from Diss. One which we examined agreed with Montagu's description; to which might be added, that the upper mandible is notched, and the base of the bill beset with *vibrissæ*. It may also be remarked, that when the mandibles are closed, the suture appears of a yellowish hue: the upper parts of the head and the back to the insertion of the tail, have a silvery tint upon them, and in particular lights are damasked, as it were, in longitudinal lines. The under parts of the young are deeply tinged with yellow. In the evening the Greater Pettychaps will sit in the midst of a thick bush, and warble very melodiously for a length of time, in that respect resembling the Nightingale. It will frequently begin its

its song exactly like that of a Blackbird, but always ends with its own. Its general habits are similar to those of the Yellow Wren; for, like that bird, it seems constantly in motion, hopping about from bough to bough in search of insects, and singing at intervals.

7. *S. cinerea* (White-throat, Hay-jack).

8. *S. Curruca* (Lesser White-throat).

We have noticed the Lesser White-throat more than once at Starston, and have also procured its eggs at the same place. It appears to be not uncommon in the neighbourhood of Diss, at which place we have seen several nests belonging to this species. In the month of July 1820, we observed a Lesser White-throat very busy in picking the *Aphis lanigera* from the apple-trees. This bird often utters a remarkably curious and fine-drawn note, scarcely to be heard. It also warbles softly and finely, as Montagu observes; and before its common note *chu, lu, lu, lu,* it usually begins with a short and gentle warble.

9. *S. Rubecula* (Red-breast).

10. *S. Phanicurus* (Redstart, Firetail).

Perhaps the Redstart sings earlier and later than any other diurnal songster. We have heard it singing after ten o'clock at night, and at three the following morning. A Redstart, which built in our garden in the summer of 1819, adopted part of the song of a Lesser White-throat, which much frequented the same place; and its imitation was so exact as sometimes to deceive the nicest ear. Almost all the summer warblers are, more or less, mock-birds.

11. *S. Hippolais* (Lesser Pettychaps, White-throat).

12. *S. sibilatrix* (Wood Wren).

13. *S. Trochilus* (Yellow Wren, Oven Bird).

14. *S. Regulus* (Golden-crested Wren).

The nest of this bird is generally built underneath the branch of a tree, and in form similar to that of a Chaffinch. But we have also seen it pendulous, with an aperture on one side; so that Montagu was wrong in contradicting what other authors have said on this subject. There are few birds which do not occasionally vary from the general form in building their nests. There is one peculiarity in the nest of the Golden-crested Wren: the inside of it is not made smooth, like those of the generality of birds, but loose feathers hang into the middle of the nest, so that neither the eggs, nor the young, when small, can be seen. The design of this structure seems to be, to preserve the warmth of its diminutive contents.

15. *S. Troglodytes* (Common Wren; Jenny Wren, Kitty, Titty, and Bobby Wren).

Genus XIV. SAXICOLA.

1. *S. Œnanthe* (Wheatear).

The Wheatear breeds in the rabbit-burrows which abound in the sand-hills on the coast of Norfolk. In Suffolk it frequents gravel and sand-pits, heaths, and uncultivated places: it is also found on similar spots in the first-mentioned county.

2. *S. Rubetra* (Whinchat).

3. *S. Rubicola* (Stonechat).

Genus XV. Accentor.

1. *A. modularis* (Hedge Warbler).

Genus XVI. Motacilla.

1. *M. alba* (White Wagtail).

2. *M. Boarurula* (Gray Wagtail).

The Gray Wagtail is by no means uncommon in the autumn and winter season in the low meadows by the river Gipping in Suffolk, and likewise in the neighbourhood of Higham. It is also frequently met with in Norfolk at the same seasons. It runs upon the tops of the weeds, which are partly submerged in the ditches, and probably feeds upon the *Dytisci* and *Gyrini*, which are almost always to be found in those situations.

3. *M. flava* (Yellow Wagtail).

This species is not generally plentiful in Suffolk, though it is pretty common on parts of the river Waveney, which divides that county from Norfolk.

Genus XVII. Anthus.

1. *A. pratensis* (Tit Lark).

2. *A. arboreus* (Field Lark).

A common species in the neighbourhood of Harleston during the summer; and it is also found in various parts both of Norfolk and Suffolk. This bird is subject not only to an *Hippobosca*, but likewise to a large species of *Acarus*. Five of these insects were taken off the head of a lark on the first day of its arrival.

Genus XVIII. ALAUDA.

1. *A. arvensis* (Skylark).

It appears from the following remarks of Mr. Woolnough of Hollesley, that these birds frequently migrate into this country from the Continent in autumn, and return thither in the spring. Mr. W. thus writes:—"I have frequently seen *larks* and *rooks* come flying off the sea; not in one year only, but in many; not on one day only in the same year, but on several. I have seen them coming off the sea for many hours in the same day;—the *larks* from five and ten to forty or fifty in a flock; the *rooks*, on the same day, in companies from three to fifteen. This I once observed in November for three days in succession; the early part of that month was the general time of their coming: our fields were then covered with the *larks*, to the great destruction of the late-sown wheat. They generally remained with us till the first heavy fall of snow, and then disappeared. Early in the February following they appeared again on the coast in innumerable flocks, but disappeared as soon as the weather became fine, with a light westerly wind: from which circumstance I concluded that they again crossed the sea. They appeared to me to be the same as our common Skylarks.

"Those *larks* and *rooks* that I have seen coming off the sea, did not appear like birds that had flown off for pleasure; they always flew low, close to the water, and seemed fully intent on reaching the shore, on which they often alighted directly on reaching it."

2. *A. arborea* (Woodlark).

The Wood-Lark breeds in this part of the kingdom, but it is a thinly-scattered species.

Genus XIX. Parus.

1. *P. major* (Great Titmouse).

This species has an astonishing variety of notes. When disturbed on its nest it will make a hissing noise, and boom with its wings like the Blue Titmouse. We have seen such a number of the Great Titmouse in a large plantation of evergreens at Campsey Ash, that the place resounded with the noise of their beaks rapping against the bark of the yew-trees. The large hind toe and crooked claw of this kind, and of others of the genus, are doubtless of service in enabling these birds to hang in a variety of attitudes while searching for their food.

2. *P. ater* (Colemouse).

3. *P. cæruleus* (Blue Titmouse, Betty Tit and Jenny Tit).

In winter the Blue Titmouse frequents the sheds in which turnips are kept, for the sake of feeding on the maggots which are frequently found in that root, and many of which are exposed when the tops of the turnips are cut off previous to their being given to the cattle.

4. *P. palustris* (Marsh Titmouse).

5. *P. caudatus* (Long-tailed Titmouse, Pudding-poke, Capon Long-tail).

In this part of the kingdom the Long-tailed Titmouse is known by the name of Pudding-poke, without doubt from the circumstance of its building its nest in the form of that household article. We have more than once this spring observed an old bird of this species sitting in its nest, with its head partly out of the hole

hole in the side of the nest, and its tail turned over its head, and projecting about an inch and a half.

6. *P. biarmicus* (Bearded Titmouse).

Genus XX. EMBERIZA.

1. *E. Citrinella* (Yellow Bunting).

2. *E. Miliaria* (Common Bunting, Clod-bird).

3. *E. Schœniclus* (Reed Bunting).

The Reed-Bunting uses the same artifice to attract attention from its nest, as the Partridge does to save its young,—limping along upon the ground, screaming, and shaking its wings.

4. *E. nivalis* (Snow Bunting).

Flocks of Snow Buntings visit the coast of Norfolk every winter; and they are sometimes found in great abundance at Caistor near Yarmouth.—The wings of this species are long and pointed, which give it somewhat the appearance of a Sandpiper in flight. This enlarged power of wing was probably designed to enable the bird to accomplish its migrations to and from the arctic circle.

Genus XXI. LOXIA.

1. *L. Curvirostra* (Crossbill).

In the year 1810 Crossbills were numerous at Offton in Suffolk. March 4th, 1815, a small flock of them again made their appearance at the same place, and were very busy in feeding upon the seeds of Scotch, Spruce, and Larch Firs, apparently giving the preference

preference to the latter. A male bird sang a little on their first arrival; and in a few days after he poured out his full note, which was very agreeable, and equal to that of many of our singing birds, though different from the note of any other bird we ever heard. We saw him tread the hen, which convinced us that they would breed there. On the 26th of March they had completed their nest, and we were looking forward with the expectation of seeing the progress of rearing their young, when our hopes were disappointed by a Hawk, which killed both the old birds. A pair of Crossbills were, however, more fortunate at Livermere, having succeeded in rearing their young several times in the garden of Lee Acton, Esq. of that place. They built on a Fir-tree.

Genus XXII. Phyrrhula.

1. *P. vulgaris* (Bulfinch, Blood-Olph).

Genus XXIII. Fringilla.

1. *F. Coccothraustes* (Hawfinch).

The Hawfinch has occasionally been seen both in Norfolk and Suffolk, and for the most part during the winter season.

2. *F. Chloris* (Green Grosbeak).

3. *F. domestica* (House-Sparrow).

The growth of the feathers of the young of this bird is very rapid in hot weather. On the 9th of August we took a young Sparrow from a nest; there was neither down nor feathers upon it, but the rudiments of the feathers were visible under the skin upon the back of the head and along the back: on the sides of the wings the shafts of the quills had just pierced the

skin. Eight days afterwards we took another young one from the same nest. This bird was covered with feathers, and was able to make some use of its wings. The parent birds had adapted the food which they brought to their young to their powers of digestion. The stomach of the first of the above Sparrows was weak, and filled almost entirely with insects; only one grain of wheat and a few grains of sand were found in it. In the second the gizzard was become vastly more muscular, and contained nine grains of wheat nearly whole, besides some pieces, the remains of several small beetles, and some pretty large gravel-stones.

4. *F. montana* (Tree-Sparrow).

We have received a specimen of the Tree-Sparrow from the Rev. H. Tilney of Hockwold, at which place it breeds. Mr. Scales pointed out to us this species at Beechamwell, and favoured us with its eggs. We have also seen it at Freston in Suffolk.

5. *F. cælebs* (Chaffinch, Spink).

6. *F. Montifringilla* (Brambling).

This winter bird of passage sometimes makes its appearance in very large flocks. At Beechamwell, Mr. Scales considered them of service to his land, from their devouring in great abundance the seeds of the Knot-grass (*Polygonum aviculare*). In the severe winter of 1819-20 large flocks of these birds were observed at Stratton Strawless feeding on the Beech-mast. Bramblings have been observed in the spring as late as the 27th of April. A male and female, which were only winged, we kept for some time in a cage, and fed with canary and hemp seed, of which the former agrees with them best. The male was the larger

of

of the two: he would frequently erect his crest, and both of them would snap their beaks at each other by way of menace. He had no regular song, but uttered notes resembling those of the Greater Redpole and Green Grosbeak, and also the gentle complacent note occasionally uttered by the female Chaffinch.—Latham says the legs are gray, and Bewick describes them as pale-brown. The hind part of the legs and the bottoms of the feet of a specimen which we examined, were of a bright yellow. In a female killed late in April, the remark of Linnæus, *alarum basi subtus flavissima*, was very striking.

7. *F. cannabina* (Common Linnet).

8. *F. montium* (Twite, French Linnet).

This is a winter bird of passage. We have found them plentiful in the month of October on Pewit Island, and on the main land of Essex near it, in flocks of ten and twenty together; and towards evening we noticed a flock of about a hundred: so that it seems not improbable that the flocks may collect together to pass the night. No other birds were mixed with these flocks, which were feeding on the seeds of the Marsh Samphire (*Salicornia herbacea*), and Sea Starwort (*Aster tripolium*). Their little twittering note, as they sit or fly, might easily be mistaken for that of the Siskin; but their *ay, ay, ay, twìte, twìte, twìte,* (whence certainly their name,) at once distinguishes them. Twites are found in the salt-marshes near Yarmouth; and we have seen a flock of them at Shotley Point in Suffolk. A Twite was killed on the 23rd of May; so that a few may perhaps breed in this country. Mr. Scales informs us that this species of Finch visits Beechamwell very early in the spring, and feeds upon the seeds of the Alder as they drop from the cones.

At half-past five o'clock in the morning of March 20th, 1820,

a very extraordinary migration of small birds was witnessed at Little Oakley in Essex. The attention of the observer was arrested by an uncommon chattering of birds, and looking up he beheld an incredible number of small birds flying a-breast, in a line extending as far as the eye could distinguish them, and three or four yards deep. Their direction was towards the south-east, the wind favouring them; their height only a few yards from the ground. The flock was supposed to consist principally of Chaffinches, Linnets, Twites, and Bramblings. None of the two latter species were seen in the neighbourhood after that time; and there is on those shores in the winter season an immense quantity of Linnets, more than can be bred in the neighbourhood.

9. *F. Spinus* (Siskin).

Small flocks of Siskins are occasionally seen in Norfolk and Suffolk during the winter season, particularly in severe weather. A flock of them was observed at Sturston as late as the 4th of March, 1820. They kept up a constant twittering as they flew briskly from tree to tree, apparently for the purpose of keeping the flock together. The twittering of this bird very much resembles that of the Lesser Redpole.

10. *F. Linaria* (Lesser Redpole).

11. *F. Carduelis* (Goldfinch).

Genus XXIV. CUCULUS.

1. *C. canorus* (Cuckoo).

The opinion still prevails among the vulgar in Suffolk, that Cuckoos are transformed into Hawks in winter.—On July 31st, 1816,

1816, we observed a pair of Red-backed Shrikes very busy in feeding a young Cuckoo which was perched on an oak. This fact confirms Temminck's remark, who says that the Cuckoo will sometimes lay its egg in the nest of the above-mentioned Shrike. It also contradicts Montagu, who asserts that "the Yellow-hammer's egg is larger than that of any other bird in whose nest the Cuckoo chooses to lay:" for the egg of the Red-backed Shrike is larger than that of the Yellow-hammer. We have heard the note of the old Cuckoo as late as the last day in July. The note of the female Cuckoo resembles that of the Common Gallinule. A Cuckoo has been observed to enter the nest of a Magpie, probably for the purpose of devouring the eggs, which, according to Temminck, constitute part of its food.

Genus XXV. Picus.

1. *P. viridis* (Green Woodpecker).

2. *P. major* (Greater Spotted Woodpecker).

An old male bird of this species was brought to us, which was shot whilst flying about and making a most vociferous noise, as a boy was robbing its nest from a hole in a tree. The young, three in number, were completely fledged; and what is singular, one of them weighed more than the old bird. Their plumage exactly corresponded with that attributed to the *Picus medius* of English authors. This instance, therefore, is a corroboration of that mentioned by Montagu in proof that these two birds are the young and old of the same species. We have killed the young of this species in the act of making a jarring noise, and are unable to reconcile this fact with the assertion of Montagu, that the jarring noise is the call of love. But every difficulty upon the subject vanishes if the statement of Wilson be correct, who

asserts

asserts that the jarring noise made by Woodpeckers is designed to drive insects from their lurking-places.

3. *P. minor* (Lesser Spotted Woodpecker).

This species is pretty common at Campsey Ash in Suffolk; and it also breeds in Helmingham Park in the same county. Mr. Hunt has frequently observed it in his garden at Norwich.

Genus XXVI. YUNX.

1. *Y. Torquilla* (Wryneck).

In general Bewick's figures are remarkable for their accuracy; but that which he has given of the Wryneck is faulty: the beak is too long, the head too small; and, indeed, the whole figure represents the bird smaller than it really is. He has also made the legs too slender, for it has exceedingly stout ones. The Wryneck in fact is, as White observes, a very robust bird.

Genus XXVII. SITTA.

1. *S. europæa* (Nuthatch).

The Nuthatch is met with in great numbers at Campsey Ash. The great length of its hind toe, in addition to its use in assisting it to run up and down the trunks of trees, probably assists it in grasping and carrying away nuts. It generally breeds in the holes of trees made by the *Picus viridis*, which, being too large, it walls up with mortar to a proper size. It lays five, and often six eggs, and is so tenacious of its nest that the bird will retain its possession until the last.

Genus XXVIII. CERTHIA.

1. *C. familiaris* (Common Creeper).

Genus

Genus XXIX. Upupa.

1. *U. Epops* (Hoopoe).

Several instances have occurred of the Hoopoe having been met with both in Norfolk and Suffolk, particularly in the latter county.

Genus XXX. Merops.

1. *M. Apiaster* (Bee-eater).

A Bee-eater, killed on a white-thorn at Blyburgh in the month of May, is now in the possession of Mr. Whittingham of Yoxford. Another, shot near Yarmouth, is in the collection of Mr. Seaman of Ipswich. This is a smaller bird than the former. In the third volume of the *Linnean Transactions* mention is also made of a bird of this species having been killed in Norfolk.

Genus XXXI. Alcedo.

1. *A. Ispida* (Kingfisher).

The Kingfisher appears to vary much in size: we have seen large ones in Suffolk and in Essex, whereas all those we have met with in Nottinghamshire have been smaller. This bird seems to be subject to a partial migration, as it comes up the river Gipping in Suffolk every autumn. In the autumn of 1818 Kingfishers abounded along the shores and creeks of the Stour, though not one was to be seen in the summer. At the latter end of the last year none were to be found in the same places. Some were destroyed by the severity of the preceding winter, and were picked up dead; and it is probable that others might have perished by the rising of the waters from the heavy rains which fell during the breeding season. Temminck asserts that this bird, besides fish, will eat aquatic insects, worms, leeches, and snails. A young one which Montagu had would eat nothing but

but fish, and died in a few weeks for want of proper food. The Kingfisher will sometimes lay its eggs on the bare earth, at the end of a hole, without making any nest. In Suffolk the nests of this bird have been found in holes in gravel-pits, at the distance of a mile from any large pond or river. The eggs are white and round.

Genus XXXII. HIRUNDO.

1. *H. rustica* (Swallow).

At the time when Swallows are congregated in the autumn for the purpose of migrating, a part of them have been observed to ascend in the air in a spiral direction beyond the reach of human vision, and after continuing out of sight a short time, to descend again. Sometimes they would continue to do this at intervals for two or three days together, and then all would disappear. Query: Do they ascend in this manner to ascertain whether there is an upper current of air favourable to their migration? and do they prefer migrating high in the air, in order to have a greater scope of vision?

A young Swallow, which was kept alive by a lady, was observed to become uneasy as the time of migrating approached; and when its cage was hung in the air, the wild Swallows came about it, and appeared to invite it to go with them. After they had all disappeared it became tolerably easy.

The following extraordinary circumstance in the natural history of the Swallow, which occurred at Christ Church, Ipswich (the residence of the Rev. Mr. Fonnereau), very forcibly illustrates the unusual coldness and backwardness of the season:—"On the mornings of the 5th and 6th of June 1816, the gardeners could have taken up hundreds of these birds in their hands: they were collected in knots, and sat on the grass in parcels of thirty and forty. This, there is reason to believe, was owing

owing both to cold and hunger."—*Suffolk Chronicle*, June 15, 1816. The same summer many House Martins were found dead on the ground in Norfolk, and others were so weak that the cats sprang upon them and caught them as they flew near the ground. A pair of these birds, which had completed a nest under the eaves of our house, were both found dead in it before any eggs were laid. From the above circumstances birds of this kind were unusually scarce throughout the summer.

2. *H. urbica* (Martin).

Some young Martins did not leave their nest at Starston till the 7th of October, 1819; and on the 11th of the same month all the Martins had left that part of the country.

Genus XXXIII. Cypselus.

1. *C. murarius* (Swift, Deviling).

Genus XXXIV. Caprimulgus.

1. *C. europæus* (Goatsucker).

We have twice seen a Goatsucker hawking about in search of food in the middle of the day; and upon one of these occasions the sun was shining very bright.

Genus XXXV. Columba.

1. *C. Palumbus* (Ring-Dove, Dow).

2. *C. Œnas* (Stock-Dove).

We are informed by Mr. Scales of Beechamwell that the Stock-Dove breeds upon his warren in old rabbit-burrows. He describes the eggs as being much rounder, and less than those

of the Ring-Dove. When the warreners find the young in a burrow, they fix sticks at the mouth of the hole in such a manner as to prevent the escape of the young, but to allow the old birds to feed them; and when they are in good condition they are taken for the table. This bird is now rarely seen in Suffolk; formerly it used to visit that county in prodigious flocks during the winter season, feeding on the Buck-wheat stubbles. Mr. Leathes says that it breeds in old trees near the decoy at Herringfleet. It lays two eggs, which are nearly oval.

3. *C. Turtur* (Turtle-Dove).

Genus XXXVI. PHASIANUS.

1. *P. Colchicus* (Pheasant).

At Campsey Ash, where the Pheasants are well fed with potatoes, buck-wheat, and barley, a cock Pheasant has been killed which weighed four pounds and a half.

Genus XXXVII. PERDIX.

1. *P. rubra* (Guernsey Partridge).

These birds are now very plentiful in some parts of Suffolk. We have seen at least 150 brace in a morning upon Dunningworth-heath; and they are found in greater or less numbers from Aldborough to Woodbridge. A few are also sometimes seen in Norfolk. And in moving a straw-stack in the neighbourhood of Harleston last summer, a nest of the Red-legged Partridge was found upon the top of it, in which were six eggs.

The sportsman finds birds of this kind more difficult to get at than the Common Partridge, as they run very much before the dogs.

2. *P. ci-*

2. *P. cinerea* (Partridge).

The Partridges at Blakenham in Suffolk, where the soil is chalky, are said to be of a lighter colour than they usually are seen upon other soils. We know not whether the same remark has been made upon those which inhabit the other chalky districts of the kingdom. Temminck, in his *Natural History of Pigeons and Gallinaceous Birds*, observes, that the Common Partridge, as well as other birds, is subject to vary both in size and colour from local causes, particularly from the abundance or want of food. We have seen a brace of White Partridges, which were killed last year at Kittleburg in Suffolk: through the white, the markings of the feathers, on close inspection, faintly appear.

The bills of young Partridges are dusky at the base, with horn-coloured tips. Those of the old ones are of a pale lead colour. The legs of the young birds have a yellow tinge, which in the old ones is changed to a blueish tint.

3. *P. Coturnix* (Quail).

This species used formerly to be very common in the neighbourhood of Diss. It is now become scarce, but still occasionally breeds in that part of the country: and not long since two Quails' nests were found by some workmen mowing clover. In one of them there were seventeen eggs; in the other, twelve. We have also received its eggs from the neighbourhood of Hunstanton in Norfolk. These birds are also become scarce in those parts of Suffolk where they formerly abounded.

Genus XXXVIII. Otis.

1. *O. Tarda* (Great Bustard).

These noble birds still continue to breed in the open parts both of Norfolk and Suffolk, though they are become much scarcer

scarcer than formerly. The places most frequented by them are, Westacre in the former county, and Icklingham in the latter. At both places they are carefully preserved by the proprietors. In the summer of 1819, nineteen of them were observed together at Westacre. We have twice seen a male Bustard in the neighbourhood of Burnham. It suffered itself to be approached to about the distance of a hundred yards, then walked deliberately a few paces, and took wing without the least difficulty. In flying it moved its wings slowly, more like a Heron than one of the gallinaceous tribe. Mr. Hardy of Norwich has more than once succeeded in domesticating this species.

2. *O. Tetrax* (Little Bustard).

We have been informed by John Cooper, Esq. of Bungay, that a female Little Bustard was killed near that town in November 1804. A bird of the same species was also shot on the bank of the Ipswich river, near the seat of Sir Robert Harland, in whose possession it now is.

Genus XXXIX. ŒDICNEMUS.

1. *O. crepitans* (Thick-kneed Bustard).

Genus XL. CALIDRIS.

1. *C. arenaria* (Sanderling).

The Sanderling visits the eastern coast of England in the spring, and remains till the autumn. Its toes are fringed with a widely serrated membrane, which is probably of service in giving it support upon soft ground. The flight of this bird is very placid, and without noise.

Genus XLI. Hæmatopus.

1. *H. Ostralegus* (Oyster-catcher).

The northern shore of Norfolk is a favourite breeding-place of this species. The Oyster-catcher is an expert diver; one which had its wing broken was with difficulty caught by a good water dog.

Genus XLII. Charadrius.

1. *C. Pluvialis* (Golden Plover).

Golden Plovers make their appearance in this part of the kingdom in the spring, on their passage to the North, and again on their return towards the end of the year, at which season they are sometimes seen in large flocks; and they have been killed as late as the end of December. It is probable that they may occasionally breed in Norfolk, as a few of these birds were seen last year during the breeding season on Mousehold-heath near Norwich.

2. *C. morinellus* (Dottrel).

Both in spring and autumn the Dottrel has been met with in Norfolk. A considerable number of them were seen in May 1816 in the parts westward of Burnham. We have also noticed them on Martlesham-heath, Suffolk.

3. *C. Hiaticula* (Ringed Plover).

Mr. Scales informs us that the Ringed Plover breeds on the warren at Beechamwell: this place is many miles distant from the sea. And in Mr. Sabine's museum there are specimens of this species of Plover which were killed at Elston near Thetford.

Genus XLIII. VANELLUS.

1. *V. Melanogaster* (Swiss Sandpiper).

This beautiful bird has been met with several times in the spring of the year at Yarmouth, probably on its passage to its breeding haunts. It has also been killed at the same place late in autumn, at which time it has acquired the plumage usually attributed to the Gray Sandpiper; and it is by no means uncommon on the Essex coast throughout the winter. As the plumage upon the upper parts of this bird in autumn is interspersed with yellow spots, it assumes at that season a resemblance to a Golden Plover. And there can be little doubt that it was a Swiss Sandpiper in its autumn dress to which Mr. Markwick alludes, when he says, "I once saw a Golden Plover which had a small back toe."—*Linn. Trans.* vol. iv. pp. 25, 26.

The flight of the Swiss Sandpiper is smooth, gentle, and without noise, much like that of the Sanderling; and it carries its wings arched in flight, in the manner of that bird.

2. *V. cristatus* (Lapwing, Flap-Jack, Horn-Pie).

Genus XLIV. STREPSILAS.

1. *S. collaris* (Turnstone).

These birds are found sparingly on the sea-coast. We noticed five of them passing from the Mussel Islands to the main-land of Essex: they flew in a line one after the other, and so low as almost to touch the water.

Genus XLV. CICONIA.

1. *C. alba* (White Stork).

A few years since a pair of White Storks were seen at Gorleston, and one of them was killed. Another pair was observed at Aclea

Aclea in the month of June 1817. And about the same time a female of this species was killed near Burgh Castle, and another in the month of November following.

Last year two young Storks were taken from a nest in Holland, and given to Mr. Harrison. They have borne the winter, though not without much shivering on the coldest days, on which they were always observed to be more than usually voracious. Each of them has swallowed two rats which were more than half-grown; and whilst the tail of the second was hanging out of the bill a third has more than once been attempted. On these cold days, when Mr. H. has been cutting horse-flesh for them, so voracious have they been that he was fearful of cutting the ends of their bills as they darted at their food. They rest much on one leg; and are fond of wading into a pond, from which they procure some kind of food, though there are no fish therein.

Genus XLVI. Ardea.

1. *A. cinerea* (Common Heron).

We once watched the motions of a Heron which was standing by the side of a river, where the bank was rather steep: in darting at a fish he precipitated himself into the water, but was out again in an instant with his prey. When a Heron has caught a large eel, it carries it upon firm land, and dashes it repeatedly with violence against the ground, till the fish is so weakened that it can be swallowed with ease. The edges of both the mandibles of this bird are sharp, which structure enables it more securely to hold its slippery prey.

We remarked in a paper already laid before the Society, that the feathers of this species are frequently loaded with a blue powder. We have since noticed an abundance of white dust upon the feathers of the breast and belly of a White Owl killed in

in August. Bruce, upon lifting the Bearded Eagle which he shot in Abyssinia, found himself covered with a yellowish dust; the plumage of the bird being tawny. The flesh of the Heron is much admired by some persons. The legs have sometimes a rank fishy taste, though the other parts of the bird are well-flavoured.

2. *A. Egretta* (Great White Heron).

On the 3rd of October last, in a walk on the banks of the river Stour, we observed a large White Heron cross over from the Suffolk to the Essex side of the river. It appeared to be pure white, and to stand up rather taller than some Common Herons which were feeding not far off. A similar bird was observed in the spring on the Oakley shores; and, subsequently to our observation, one was seen on the banks of the river Orwell.

3. *A. Nycticora* (Night Heron).

Mr. Stagg of Yarmouth shot a Night Heron upon a tree in his nursery. And we are informed by Mr. Hunt, that the specimen of this bird in his possession was shot in Suffolk, and kept alive some time, being only slightly wounded. Another bird of the same species was killed at Mr. Coke's in the winter of 1819, and is now in the possession of the Rev. George Glover.

4. *A. stellaris* (Bittern).

Some of the marshes of Norfolk afford a breeding-place to the Bittern, whence we have received its egg, both ends of which are nearly of the same shape. Pennant has justly remarked that this bird has a double iris. In one which we examined, that next the pupil was reddish-yellow, the outer one hazel. There was also a notch at the extremity of the upper mandible;

mandible ; and both mandibles, nearly half-way along the edges (reckoning from their tips), are furnished with a beautiful and regular serrature, the points of which stand inward, and are so fine as almost to require a magnifying-glass to distinguish them. This structure must be of great service to the bird in securing its prey.

5. *A. ralloides* (Squacco Heron).

An account has already been laid before the Society by Mr. Youell of a beautiful specimen of this rare bird which was taken at Ormesby.

6. *A. minuta* (Little Bittern).

We are assured by Mr. Hunt that a Little Bittern was killed at Burlingham in the winter of 1819.

Genus XLVII. Recurvirostra.

1. *R. Avocetta* (Avoset, Shoeing-horn).

During the breeding season the Avoset used to frequent the marshes at Winterton ; and in the summer of 1816 we saw one there which had young. This bird made several circles round us, uttering a shrill note, and then alighted in the middle of a pool of water, on which it floated ; then took several turns on wing, and again alighted on the water, where it sat motionless. The bill of the Avoset is so flexible that it is totally unfit for a weapon of offence, and the bird itself has a peculiarly harmless and meek appearance.

Genus XLVIII. Platalea.

1. *P. Leucorodia* (Spoonbill).

This species is occasionally met with near Yarmouth, and generally

generally during the winter season. It has also been shot on the river Stour, which divides the counties of Essex and Suffolk. A pair of Spoonbills were seen at Cromer in June 1818; and one was killed at Yarmouth in the month of May of the same year. In the stomach of this last bird there was an abundance of the shells of shrimps.

Genus XLIX. IBIS.

1. *I. Falcinellus* (Glossy Ibis).

We have seen a bird of this species which was shot in the winter of 1818 in the marshes on the western coast of Norfolk, near Lynn. It did not appear to have attained its full plumage, from the circumstance of its having four transverse bars of white on its throat. In the month of May 1822, three birds of this species were seen at Hockwold in Norfolk. Two of them were killed, and are in the possession of the Rev. Henry Tilney of that place.

Genus L. NUMENIUS.

1. *N. Arquata* (Curlew).

Curlews may be met with at all times of the year between Ipswich and Harwich; but their nests have hitherto not been found in those parts. The common note of this species is *hoë, hoë, hoë, hoë.* It has another note, which may be sounded *kor-lew*, whence its name.

2. *N. Phæopus* (Whimbrel, Half-Curlew).

These birds arrive upon the coasts of Essex and Suffolk early in May, and migrate again in the latter part of the autumn. The note of the Whimbrel may be thus expressed, *weddy, tetty, tetty, tetty, tet*, quickly repeated.

Genus LI. Tringa.

1. *T. subarquata* (Pigmy Curlew).

Several of these birds have been killed at Yarmouth in the autumn. One of them, which was shot at that place in the month of August, had a red breast, and was in plumage similar to the one in a summer dress preserved in the British Museum. We have met with this species on Pewit Island. It is more solitary than the Dunlin, not more than a pair being seen together; and is a stupid bird, suffering a boat to approach close to it. The legs of this bird when fresh killed are of a pale-green, but when dried they appear black.

2. *T. variabilis* (Dunlin, Sea-Snipe, Stint).

Very large flocks of Dunlins are sometimes seen on the eastern coast of the kingdom.

3. *T. maritima* (Purple Sandpiper).

A few of these birds have been killed at Yarmouth. We once observed a Sandpiper, which appeared to belong to this species, flying along the shore of the Stour, hovering like a bird of prey, and continually darting down close to the ooze.

4. *T. minuta* (Little Sandpiper).

We have received this bird from Yarmouth, and also killed it on Ray Island in the river Stour.

5. *T. cinerea* (Knot).

In spring the Knot visits the coasts of this part of the kingdom, on its way to the North to breed; and again makes its appearance on its return, sometimes as early as the month of August; but the principal flocks arrive later in autumn, and a

few sometimes remain throughout the winter. At these times it is found in various states of plumage. Some of the birds killed in the spring have only partially acquired the red breast; and of those shot in autumn some have only partially lost it. This appears to be an exceedingly stupid species. We met with a flock of sixteen in September last, which, though repeatedly shot at, would not leave the spot, and were all killed. Some of them being wounded fell into the water, and swam about with great ease. A Redshank, which was shot the same day, showed an equal facility in swimming. The species was observed by Captain Parry within the arctic circle.

6. *T. Pugnax* (Ruff).

Ruffs and Reeves breed in the marshes of Norfolk; but they are becoming scarcer every year, on account of the old birds being eagerly sought after as soon as they arrive, for the London market; to which place also the eggs are sent, together with those of many other marsh birds. The Reeve is very tenacious of her eggs. In the summer of 1817 one was taken upon the nest by the warrener's boy at Winterton, who carried it to his master, and was ordered to set it at liberty: on the following day we found the same bird upon her eggs again.

Genus LII. TOTANUS.

1. *T. fuscus* (Spotted Snipe).

A bird of this species, in the autumn plumage, was killed at Yarmouth, and preserved by Mr. Youell. Another, shot near Ipswich, in its summer dress, is now in the British Museum. Mr. Wigg of Yarmouth has also seen two other specimens which were shot near that town.

The use of the small web between the outer and middle toes of this and of several other species of waders appears to be, to give

give the bird a surer footing when wading upon soft mud. In consequence of this structure, the inner toes of each foot must necessarily sink deeper than the outer ones, and secure the bird from all danger of falling over on either side.

2. *T. Calidris* (Redshank, Red-legs).

A specimen of this bird, examined April 28th, varied from the descriptions given by Linnæus and Montagu. The base of the lower mandible only was red; the coverts of the primaries were purplish on their outer webs, and dusky black on their inner. Montagu says "the secondaries are tipped with white:" in the above specimen they were more than half white.

The Redshank is found in considerable numbers in many of the marshes both of Norfolk and Suffolk during the breeding season. It is indeed more common than any other kind of wader. To sportsmen it is very troublesome, flying around them and uttering an incessant shrill whistle, which alarms all the birds near the spot. A few Redshanks are sometimes met with during the winter season, but the greater part of them migrate. This species is found solitary and also in flocks on the ooze of the river Stour. The ordinary posture of the young Redshank is with the head sunk back between the shoulders, the back of the neck being void of feathers, like that of the Bittern.

3. *T. Ochropus* (Green Sandpiper).

We cannot positively affirm that this species breeds here, though it seems probable that it sometimes does so, as five Green Sandpipers were constantly found one summer near the old decoy at Levington in Suffolk. It is seen in these counties throughout the winter.

4. *T. Hypoleucos* (Common Sandpiper, Summer Snipe).

The Common Snipe comes up the river Gipping in Suffolk in the

the spring, and stays till the end of autumn. At night it makes a remarkably loud piping noise. Some years since, we saw a Sandpiper flying across a river attacked by a Hawk, when it instantly dived, and remained under water until its enemy disappeared. It then emerged, and joined its companions. This bird when flushed, sometimes utters a note resembling as nearly as possible that of the Kingfisher. It has a habit of jirking its tail up and down as it runs.

5. *T. Glottis* (Greenshank).

Genus LIII. LIMOSA.

1. *L. Melanura* (Red Godwit).

We have named this bird (the Red Godwit of English authors) after Temminck, because both species of British Godwits have red breasts in spring.

Some of these birds used to breed in the marshes of Norfolk, and three years since we received the egg of this species from Yarmouth. But it is doubtful whether they are to be found at present in their former haunts. The draining of the marshes, the eagerness with which eggs are sought after for market, and the keen pursuit of sportsmen, have rendered water-birds of all kinds much scarcer than they used to be formerly. There was, however, a large flock of these birds at Yarmouth in October 1819.

2. *L. rufa* (Common Godwit).

We have examined specimens of this bird killed in Norfolk in various states of plumage. Those met with in autumn have been in the dress of the Common Godwit of English authors: but when the individual was killed early in the spring, it was in a state of change between that bird and the Red-breasted Snipe of Montagu. Before it leaves this country to breed, it has

assumed

assumed the full plumage of that bird; and we have noticed it in the same state on its return in the beginning of August.

Genus LIV. Scolopax.

1. *S. Rusticola* (Woodcock).

A Woodcock was killed in Suffolk on the 3rd of September 1818. Mr. Seaman of Ipswich had a bird of this species brought to him alive and in fine condition in the month of July 1817. And we have been informed by the Rev. G. R. Leathes, that the eggs and young of the same were taken two years in succession at Brettenham, the residence of the late G. Wynwyve, Esq.

2. *S. major* (Great Snipe).

We have examined several specimens of this bird killed in Norfolk. Its legs are of a light flesh-colour, blended with a slight tinge of green. The length of its bill is subject to great variation.

3. *S. Gallinago* (Common Snipe).

4. *S. Gallinula* (Jack Snipe).

Genus LV. Rallus.

1. *R. aquaticus* (Water Rail).

Genus LVI. Gallinula.

1. *G. Crex* (Crake Gallinule).

The Crake Gallinule occasionally breeds in Norfolk and Suffolk: is most common in autumn, frequenting fields of seed-clover, but is by no means abundant. One which we had alive uttered a short low inward note when alarmed or angry.

2. *G. Por-*

2. *G. Porzana* (Spotted Gallinule).

There can be no doubt that the Spotted Gallinule breeds in the marshes of Norfolk. We have seen a considerable number of its eggs at Yarmouth, which, as well as its young, were found in the neighbourhood of that place. And we are also in possession of an egg taken from a female of this species which was killed in the marshes below Norwich.

3. *G. Baillonii* (Baillon's Gallinule).

We have met with a specimen of this bird in the collection of Mr. Crickmore of Beccles, which was shot near that town. The throat, neck and belly are ash-colour; the sides and under tail-coverts barred and spotted with black and white. The back is like that of the Spotted Gallinule; but this bird is considerably smaller than that species. An extremely small Gallinule, probably of the above kind, was shot at Nacton in Suffolk many years since, and was in the possession of the late John Vernon, Esq.

4. *G. Chloropus* (Common Gallinule).

The Common Gallinule frequently roosts on trees. Two young birds of this species, which were hatched by Mr. Youell under a hen, used to take their food from the bill of their foster-mother; and it was not till they were several weeks old that they would pick their food from the ground. We have notwithstanding observed this bird in its natural state, when it had only been hatched a few days, running about upon the tops of the weeds and picking insects from them.

Genus LVII. FULICA.

1. *F. atra* (Coot).

The Coot breeds on those large pieces of water in the marshes called

called "*Broads*" in Norfolk, and on some of them in considerable numbers. In autumn and winter these birds make their appearance on the rivers in vast flocks; and upon an appointed day all the boats and guns are put in requisition, and a general attack is made upon them. On the banks of the Stour the fowlers approach them, while sitting upon the ooze, by concealing themselves behind a skreen made of bushes, which is placed upon a sledge and driven before them. There is a difficulty in plucking these birds clean, it being almost impossible to get the down off by that process. The method therefore used is, to pluck off the feathers as clean as possible, then to dredge powdered resin over the bird, and to plunge it into hot water; after which the down will come off quite clean, and the bird appear perfectly white and nice.—On crossing the Stour in the month of January 1819, in a dead calm, we observed the Coots floating upon the water in a semicircle. On our approach within about 200 yards, the whole body, amounting at the least calculation to several thousands, partly rose and flapped along the surface of the water, making a tremendous rushing noise. Had there been any wind, they would have risen into the air without difficulty; but there being none, they could scarcely disentangle their feet. We killed two wounded birds: one of them afforded excellent sport, not suffering the boat to approach it without diving, and coming up oftentimes a hundred yards off: it had the action and alertness of a Dobchick. Foxes frequent the banks of the Stour very early in the morning to catch the wounded birds, which generally make to land, and of which there are sometimes great numbers. The larger kinds of Gulls often attack and devour Coots. We have observed the latter, on the approach of their enemy, rush together from all quarters, and form a close, round, compact body, appearing like bees in the act of swarming. The Gull kept hovering over their heads, and frequently

MISSOURI
BOTANICAL
GARDEN.

dashed within a yard or two of them. Whenever he flew to a distance the Coots dispersed, and again at his return flocked together. This scene continued as long as we stood upon the shore, which was more than half an hour. White, in his *History of Selborne*, vol. ii. p. 52, says, " Dobchicks, Moorhens, and Coots fly erect with their legs hanging down, and hardly make any dispatch." Had he seen the Coots fly on the Stour, he would not have included them in the number; for they not only fly with great celerity, but also stretch out their legs backwards like the Heron. The Coot is soon reconciled to confinement, and becomes domestic. A bird of this species, having its whole plumage white except the head and tail, was seen on the Stour last December.

Genus LVIII. PHALAROPUS.

1. *P. Platyrhinchus* (Gray Phalarope).

Genus LIX. PODICEPS.

1. *P. cristatus* (Crested Grebe).

The Crested Grebe breeds on Fritton Decoy, and also on many of the *Broads* of Norfolk. It is said that the young when alarmed will get under the wings of the female, which immediately dives with them.

2. *P. rubricollis* (Red-necked Grebe).

We have seen a specimen of this bird in the collection of Mr. Hunt of Norwich, who informs us that he has had three others of the same kind killed in Norfolk. Mr. Wigg of Yarmouth has also had one shot in the neighbourhood of that place.

3. *P. auritus* (Eared Grebe).

We received a specimen of this bird from Yarmouth in the autumn

autumn of 1817. It was caught alive, and was remarkably tame, pluming itself with great composure soon after it was taken. Mr. Sabine has likewise a bird of this species, which was also sent to him from the same place.

4. *P. minor* (Little Grebe).

Genus LX. Sterna.

1. *S. Cantiaca* (Sandwich Tern).

The Sandwich Tern has been killed at Yarmouth. On the 5th of May 1820, we shot two of these birds at Walton in Essex. They had made their appearance only two days previous. The foreheads of these birds were black, and the extent of their wings 3 feet $1\frac{3}{4}$ inches. That described by Bewick, being less in breadth and having a white forehead, was probably a young bird. The legs of the Sandwich Tern are very strong; the claws crooked and strong. It has a very flapping kind of flight, and often sits on the sands at the edge of the water. It may be distinguished from the other kinds by its note, which is stronger than that of the common species. On the 24th of April last we saw two of these birds swimming in the Stour, one of which we shot.

The Common, Black, and Lesser Terns all breed on the coasts and in the marshes of Norfolk, and are plentiful in some parts. Towards the end of summer Terns congregate, and appear in large flocks upon the ooze of Breydon Water.

2. *S. Hirundo* (Common Tern).

3. *S. nigra* (Black Tern).

4. *S. minuta* (Lesser Tern).

Genus LXI. LARUS.

1. *L. marinus* (Great Black-backed Gull).

2. *L. argentatus* (Herring Gull).

3. *L. fuscus* (Less Black-backed Gull).

4. *L. canus* (Common Gull, Sea Pie, Sea Cob).

5. *L. tridactylus* (Kittiwake).

6. *L. ridibundus* (Brown-headed Gull, Puit).

Near the centre of the county of Norfolk, at the distance of about twenty-five miles from the sea, and two from Hingham, is a large piece of water called Scoulton Mere. In the middle of this mere there is a boggy island of seventy acres extent covered with reeds, and on which there are some birch- and willow-trees. There is no river communicating between the mere and the sea. This mere has from time immemorial been a favourite breeding spot of the Brown-headed Gull. These birds begin to make their appearance at Scoulton about the middle of February; and by the end of the first week in March the great body of them have always arrived. They spread themselves over the neighbouring country to the distance of several miles in search of food, following the plough as regularly as Rooks; and from the great quantity of worms and grubs which they devour, they render essential service to the farmer. If the spring is mild, the Gulls begin to lay about the middle of April; but the month of May is the time at which the eggs are found in the greatest abundance. At this season a man and three boys find constant employment in collecting them, and they have sometimes gathered upwards of a thousand in a day. These eggs are sold on the

the spot at the rate of fourpence a score, and are regularly sent in considerable quantities to the markets at Norwich and Lynn. They are eaten cold, like Lapwing's eggs, and also used for culinary purposes; but they are rather of an inferior quality, and somewhat like Duck's eggs in flavour. The person who sells these eggs gives fifteen pounds a year for the privilege of collecting them.

This species of Gull never lays more than three eggs the first time; but if these are taken, it will lay again. We found many of the old birds sitting in the middle of June; most of these had only one egg in the nest, but a few of them had two. Their nests are made of the tops of reeds and sedge, and are very flat at the top. The eggs vary so much in size, shape, and colour, that a person not well acquainted with them would suppose some of them to belong to a different species of bird. Some are thickly covered with dusky spots, and others are of a light-blue colour without any spots at all. The young birds leave the nest as soon as hatched, and take to the water. When they can fly well the old ones depart with them, and disperse themselves on the sea-coast, where they are found during the autumn and winter. By the middle of July they all leave Scoulton, and are not seen there again till the following spring. We were a little surprised at seeing some of these Gulls alight and sit upon some low bushy willows which grow on the island. No other than the Brown-headed Gull breeds at the above mere. A few of that kind also breed in many of the marshes contiguous to the sea-coast of Norfolk.

Genus LXII. Lestris.

1. *L. pomarinus* (Pomarine Gull).

A specimen of this Gull killed near Ipswich is in the collection of Mr. Seaman.

2. *L. pa-*

2. *L. parasiticus* (Arctic Gull).

We are informed by Joseph Sabine, Esq. that he procured a young Arctic Gull, killed on a rabbit-warren near Brandon the beginning of October 1819. In the same month another bird of this species was shot at Yarmouth.

Genus LXIII. PROCELLARIA.

1. *P. pelagica* (Stormy Petrel).

This kind of Petrel sometimes makes its appearance on the coasts, and has been shot from the beach at Yarmouth. The oil issued from the nostrils of one which we killed on the Stour, May 29th, 1820. The forepart of the head of this bird is curiously peaked, which does not seem to be noticed by any author. It is extremely buoyant when floating on the water.

Genus LXIV. ANAS.

1. *Anser ferus* (Gray-lag Goose).

2. *A. Segetum* (Bean Goose).

The Bean Goose is occasionally met with in this part of the island, particularly about Yarmouth. It is said to be more common than the Gray-lag Goose.

3. *A. albifrons* (White-fronted Goose).

4. *A. leucopsis* (Bernacle Goose).

5. *A. Bernicla* (Brent Goose).

During the winter the Brent Goose is not uncommon. The cry of a flock of these birds very much resembles the noise of a pack

pack of hounds, and we have twice been deceived by it. It is among the birds observed by Captain Parry within the arctic circle.

6. *A. ruficollis* (Red-breasted Goose).

Mr. Wigg had a specimen of this rare bird, which was killed at Halvergate in Norfolk in the year 1805. He says its flesh was well flavoured.

7. *A. Cygnus* (Whistling Swan).

In severe winters these birds are not unfrequently to be met with at Yarmouth and the adjacent parts. Many of them were killed in the hard weather of 1819.

8. *A. Olor* (Tame Swan).

9. *A. Tadorna* (Shieldrake).

The Shieldrake breeds in the rabbit-burrows formed in the sand-hills upon the coast of Norfolk. Its nest is discovered by the print of its feet on the sand, and therefore most easily found in calm weather; for in windy weather the driving sand soon obliterates the impression. The old bird is sometimes taken by a snare set at the mouth of the burrow. The eggs are often hatched under domestic hens, and the birds kept as an ornament in ponds.

10. *A. Boschas* (Wild Duck).

The Common Wild Duck constantly breeds in our marshes. It is very difficult for those who live on the borders of the marshes to prevent their tame Ducks from assuming the habits of the wild ones by mixing with them, and eventually leaving the

the premises on which they were bred. This circumstance accounts for their being frequently taken in the decoys, or shot as wild-fowl.

11. *A. strepera* (Gadwall, Heart-Duck, Summer Duck).

In this part of the kingdom the Gadwall is not common. We have seen a few which were killed in Norfolk.

12. *A. acuta* (Pintail Duck).

This kind of Duck is not uncommon, and it is esteemed for the table.

13. *A. Penelope* (Widgeon, Smee, Easterling).

14. *A. clypeata* (Shoveler, Spoon-bill, Bach).

The Shoveler remains all the year in Norfolk. Mr. Youell has already stated to the Society the fact of its breeding in that county. We have twice met with its nest in Winterton marshes. It was placed in a tuft of grass, where the ground was quite dry, and made of fine grass. After the female begins to sit, she covers her eggs with down plucked from her body. The eggs are of a cream-colour, and their usual number eight or nine. In one instance as many as thirteen were discovered in a nest. In the spring of 1818 the warrener at Winterton found several nests belonging to this species, containing in the whole fifty-six eggs. The weight of the egg is one ounce two scruples.

15. *A. Querquedula* (Garganey, Crick).

It seems probable that the Garganey sometimes breeds in Norfolk, as the Rev. Henry Tilney of Hockwold had a pair brought to him on the 6th of May 1817, in the female of which

was

was a perfect egg. And Mr. Youell has received a specimen of this Duck killed near Yarmouth on the 2nd of June 1820.

16. *A. Crecca* (Teal).

A few Teal breed in Norfolk. In the summer of 1817 Mr. Youell purchased three live young ones of a person who took them from a nest near Reedham, and reared them by a common Duck. Very small young ones have also been observed in company with their parents upon Ranworth *Broad* by Mr. Kerrison of that place; and they also breed on Scoulton Mere.

17. *A. mollissima* (Eider Duck).

An old male Eider Duck in full plumage was shot at Wells in the month of January 1820. There were two others in company with it at the time. In the stomach of this bird there was a considerable quantity of *Echini* and Crabs' claws; in another was found a *Buccinum reticulatum* nearly an inch in length. A female of the same species was killed in the river Orwell the first week in November 1818.

18. *A. fusca* (Velvet Duck).

This is a rare species, but it has been sometimes killed both in Norfolk and Suffolk.

19. *A. nigra* (Scoter).

20. *A. glacialis* (Long-tailed Duck).

In severe winters these Ducks visit our shores and rivers; and they have been taken in the decoy at Herringfleet. In the winter of 1819-20 they were unusually numerous, particularly at Yarmouth, and many of them were killed. Some of these had

the two middle feathers of the tail elongated, but in most of them these two feathers did not exceed the others in length.

21. *A. Marila* (Scaup Duck, Gray-back).

22. *A. ferina* (Pochard).

This species and also the Shoveler breed at Scoulton Mere.

23. *A. Clangula* (Golden-eye Duck, Rattle-wing, Rattler).

Wilson, in his *American Ornithology*, remarks, that the Canvass-back Ducks, "even when feeding and diving in small parties, do not all go down at one time, but some are still left above on the look-out." We have observed that the practice of the Golden-eye Duck is exactly similar to that of the Canvass-back Duck in this respect.

24. *A. Fuligula* (Tufted Duck).

25. *A. leucophthalmos* (Castaneous Duck).

Mr. Wigg has had two specimens of the Castaneous Duck, both killed at different times in the neighbourhood of Yarmouth. One of them was preserved by Mr. Youell; the flavour of the other was said to have been excellent. We have also been informed that the Rev. George Glover had a bird of this species, which was shot in Norfolk a few years since.

Genus LXV. MERGUS.

1. *M. Merganser* (Goosander, Sawyer).

We saw a very beautiful specimen of the male Goosander, the under parts of which were of a fine buff-colour, at Mr. Crickmore's of Beccles. It was killed near Lowestoffe. The young male of this species has been killed in Norfolk: it was in the plumage

plumage of the female; and Mr. Hunt found that the windpipe of this bird exactly resembled that of the Goosander.

2. *M. Serrator* (Red-breasted Merganser).

Dr. Hooker purchased a bird of this kind in the market at Norwich. It is not uncommon on the Essex coast.

3. *M. albellus* (Smew).

It is not uncommon to meet with Smews on the Suffolk coast in cold weather; and they were plentiful at Yarmouth in the winter of 1819-20.

Genus LXVI. Carbo.

1. *C. Cormoranus* (Cormorant).

2. *C. Graculus* (Shag).

In an expedition on the Stour, Sept. 30, 1820, we perceived a bird at a distance swimming prodigiously fast. By great exertion we got near it, when it dived and came up two or three hundred yards in our rear. The force and velocity of this bird in the water were shown by its leaving behind it a white foaming line like the wake of a ship, and which was distinguishable at the distance of several hundred yards.

Genus LXVII. Sula.

1. *S. alba* (Gannet).

Dr. Hooker informs us that a young Gannet was taken alive some years since in the winter season at Pulham, and exhibited at Norwich: it was very fierce. This bird has also been met with both at Lynn and Yarmouth.

Genus LXVIII. COLYMBUS.

1. *C. glacialis* (Northern Diver).

In the beginning of last winter two young birds of this species were killed on the river at Yarmouth. One of them is now in Mr. Sabine's collection.

2. *C. arcticus* (Black-throated Diver).

3. *C. septentrionalis* (Red-throated Diver).

We have seen specimens of the Red-throated Diver in Norfolk, both in its full plumage and also in its speckled state: and Mr. Hunt says that it is not uncommon at Yarmouth during the winter.—The position of the feet of Divers at the extremity of the body, and their horizontal motion, enable them to make rapid turns under water in pursuit of their slippery prey.

Genus LXIX. URIA.

1. *U. Troile* (Foolish Guillemot).

2. *U. Grylle* (Black Guillemot).

3. *U. Alle* (Little Auk).

Some years since a Little Auk was taken alive in the stack-yard of the late Mr. Webb of Pulham, which place is more than twenty miles distant from the sea. Mr. Leathes has had two specimens of this bird, one of which was taken alive on the turnpike-road at Gunton near Lowestoffe; and Miss Lloyd of Hintlesham has one now in her possession which was taken out of the belly of a Codfish.

Genus

Genus LXX. Mormon.

1. *M. Fratercula* (Puffin).

Genus LXXI. Alca.

1. *A. Torda* (Razor-bill Auk).

2. *A. impennis* (Great Auk).

We are assured by Dr. Hooker that a bird of this species was some years since killed near Southwold.

A Table

A Table of the Migration of Summer Birds of Passage at Harleston in Norfolk, Offton in Suffolk, and Wrabness in Essex.

	1812.	1813.	1814.	1815.		1816.		1817.		1818.		1819.		1820.		1821.	
	Offton.	Offton.	Offton.	Harleston.	Offton.	Harleston.	Offton.	Harleston.	Offton.	Harleston.	Wrabness.	Harleston.	Wrabness.	Harleston.	Wrabness.	Harleston.	Wrabness.
Red-backed Shrike	May13	May16	May15	—	May12	—	May19	—	May 8	—	May 6	—	May 6	—	May18	—	—
Cuckoo	Apr.26	May 2	Apr.20	—	May 6	Apr.19	Apr.18	May 3	May 3	Apr.28	Apr.27	Apr.26	Apr.20	Apr.10	Apr.16	Apr.22	Apr.21
Wryneck . . .	Apr.10	Apr.19	Apr.12	Apr. 4	Apr.10	Apr.18	Apr.20	Apr.13	Apr.14	Apr.19	Mar.28	Apr. 5	Apr.16	—	Apr.17	Apr.10	Apr.16
Spotted Flycatcher	May11	May14	May15	—	May 9	—	May18	—	May19	—	May24	—	May11	—	May11	—	May10
Field Lark . . .	—	—	—	—	—	—	—	May 2	Apr.15	—	Apr.16	Apr. 9	Apr.11	Apr.17	Apr. 5	Apr.11	Apr.10
Nightingale . .	Apr.24	Apr.27	Apr.20	Apr.26	Apr.18	Apr.27	Apr.25	May 4	Apr.29	Apr.14	Apr.28	Apr.13	Apr.14	Apr.15	Apr.17	Apr.16	Apr.18
Lesser Pettychaps	Apr. 3	Apr. 9	Apr.14	Mar.27	—	Apr.17	Apr.13	Apr. 3	Apr. 7	—	Apr.11	Apr. 8	Apr. 2	Apr. 4	Apr. 5	Apr. 9	Apr. 9
White-throat . .	—	—	—	—	—	Apr.23	Apr.16	May 5	May 3	Apr.12	Apr.11	Apr.16	Apr.13	Apr.18	Apr. 8	Apr.24	Apr.19
Sedge Warbler . .	—	—	—	—	May 4	—	May 2	—	Apr.30	—	Apr.17	—	Apr.24	—	Apr.26	—	Apr.21
Yellow Wren . .	—	—	—	—	Mar.27	Apr.18	Apr. 8	Apr.13	Apr.15	Apr.12	Apr. 8	Apr. 9	Apr. 3	Apr. 8	Apr. 1	Apr.16	Apr. 9
Redstart . . .	Apr.12	Apr.11	Apr.12	—	Apr.10	Apr.21	Apr.19	Apr.18	Apr. 8	Apr.14	Apr. 9	Apr.11	Apr. 9	Apr. 8	Apr. 5	Apr.20	Apr.13
Black-cap . . .	Apr. 1	Apr. 8	Apr.15	—	Apr. 6	—	Apr.11	—	Apr.22	Apr.19	Apr. 9	Apr.20	Apr. 5	Apr.16	Apr. 6	Apr.14	Apr.19
Swallow . . .	Apr.30	Apr.21	Apr.20	Apr.12	May 1	Apr.19	Apr.19	Apr.22	Apr.21	Apr.18	Apr.11	Apr.15	Apr. 7	Apr.29	Apr. 8	Apr.19	Apr.10
House Martin . .	Apr.27	May 4	Apr.17	—	May 1	May 6	Apr.23	May13	Apr.21	—	May 5	May 9	Apr.26	—	Apr. 8	May 9	Apr.18
Swift	May25	May15	May24	—	May30	—	—	May16	—	—	May15	May 8	Apr.23	—	May15	May19	May15
Sand Martin . .	—	May 5	—	—	May 4	—	—	—	—	—	Apr.23	—	Apr.27	—	—	—	Apr.24
Turtle-Dove . .	May25	May19	—	—	—	—	—	—	May18	—	May17	—	May14	—	May17	—	May12

II. *On the Structure of the Tarsus in the Tetramerous and Trimerous Coleoptera of the French Entomologists.* *By W. S. MacLeay, Esq. A.M. F.L.S.* *Communicated by the Zoological Club of the Linnean Society.*

Read February 1, 1825.

Each succeeding day proves more and more the importance to Natural History of the utmost particularity of detail. This science is one in which correct general views can only be constructed on a minuteness of scrutiny which may be tiresome, nay, to some minds, even disgusting, but can never be unprofitable. The collector who consults books merely that he may be enabled to attach a label to some object in his museum, is as much interested in our observations being minute, as the naturalist whose study it is to ascertain the affinities and analogies which connect together all organized beings. It is only, indeed, upon minute observation that accurate descriptions can ever be founded; and it is therefore impossible for such persons as will not deign to descend into details to attain even mediocrity as naturalists. The entomologist then may say, on behalf of the minute objects which he studies and the minuteness with which he describes them, that unless a similar minuteness of observation be carried into the study of *Mammalia* and Birds, even in these important classes of the creation nothing that is certain as to affinities, nothing that is definite in nomenclature, can ever be attained. Yet even in Entomology, a science of which strict scrutiny is as it were the charac-

characteristic, we may daily perceive that accurate observation remains still a desideratum, merely because we are too apt to despise minutiæ, and too ready to adopt the recorded observations of others as true, for no other reason than because they are so recorded. A curious instance of this facility in trusting to the observations of others I shall proceed to explain; not merely because it has led myself as well as all other modern entomologists into very inaccurate descriptions, but because a system of arrangement, and that system the very one which is most prevalent on the Continent at the present day, has been founded among coleopterous insects upon such false descriptions.

Geoffroy appears to have been the first to observe that the joints of the tarsi varied in number among *Coleoptera*, and also to have been the first to make use of this variation in forming a system of arrangement for the order*. In alluding to this system of Geoffroy, M. Latreille says, "L'ouvrage de ce celébre naturaliste est peut-être celui qui a le plus contribué aux progrès de l'Entomologie, du moins en France. On lui doit la découverte du caractère important, pris du nombre des articles des tarses, caractère qui a par sa constance une plus grande valeur que celui que fournissent les antennes." (*Lat. Hist. Nat. des Crust. et Ins.* ii. 300.) M. Dumeril improved upon Geoffroy's sketch; while M. Latreille and the other French naturalists fancied that they had found a key to a natural arrangement, the honour of which would indisputably belong to France. In the *Genera Insectorum* of M. Latreille, a work which has occasioned the tarsal system to be generally adopted not merely in France but throughout Europe†, we find that the great order of *Coleoptera* is divided into five

* De Geer, *Mém. pour l'Hist. des Ins.* vol. iv. p. 7.

† Until the publication of the first number of the *Annulosa Javanica*, no English entomologist had so far broken through the trammels of this system as to arrange insects in opposition to it, except Dr. Leach, who in the 3rd volume of the *Zoological Miscellany*

five sections: the *first* consisting of *Pentamera*, or insects having five articulations to each of the tarsi of their six feet; the *second*, of *Heteromera*, or insects having five articulations to the tarsi of the four anterior feet, and only four to those of the two last; the *third* consisting of *Tetramera*, or insects having four articulations to each of the tarsi of the six feet; the *fourth*, of *Trimera*, or insects having each of the tarsi with only three articulations; and the *fifth*, of *Dimera*, or insects possessing only two articulations to each of the tarsi of the six feet. In the *Règne Animal* we have a sixth section added to these, called *Monomera*, the insects of which *are said* to have only one joint to the tarsus.

It is unfortunate for this system, that if it be considered as an artificial one, in which all coleopterous insects are to find a place, very little examination is sufficient to prove that multitudes of *Coleoptera* exist which are neither pentamerous nor monomerous, nor, in short, belonging to either of the above sections; such as, for instance, the typical species of *Onitis*, the males of which appear to have no anterior tarsus*; the genus *Cryptophagus*†, where the males and females differ in the number of joints to their tarsi; the aquatic genus *Hydroporus*‡, which is said to have four joints to the tarsi of the four anterior feet, and five to the two last, &c. &c.: all of which ought to form, by parity of reasoning, so many new sections. It is equally unfortunate that, if this system be considered as a natural one, M. Latreille and others of the more scientific entomologists who have adopted it, appear to have set it at nought whenever it interfered too glaringly

luny and in Samouelle's *Compendium* has most properly placed the *Pselaphidæ* next to the *Staphylinidæ*. In the *Horæ Entomologicæ*, page 6, I attacked the system generally, showing it to be "*by no means natural.*"

* *Onitis Sphinx* and its affinities, for instance. In *Onitis Apelles* and its affinities we may, however, observe the tarsus; but then these are species that go off to *Oniticellus*. See *Horæ Entom.* p. 56.

† *Horæ Entomologicæ*, p. 7.

‡ *Ibid.* p. 7, note.

with their notions of affinity; the consequence being, that although proposed as a natural system, they proved it to be artificial;—as, for instance, in the case of the genus *Heterocerus*, which is acknowledged by them to be tetramerous*, and is nevertheless placed among the *Pentamera*. It was therefore with some shadow of reason that other entomologists, who regarded all similar systems only as they were convenient dictionaries, complained at being called upon to see more than really existed in nature, and to account such an insect to be pentamerous merely because the French system would have it so.

The leading objections, however, which I have made to this system in the *Horæ Entomologicæ* are, in the first place, that it fails *de facto* in its object of superseding the Linnean and Fabrician systems; inasmuch as, instead of giving us a natural series, it has only added to the number of artificial systems already invented; and secondly, that it fails *de jure*; that, in brief, it could not have done otherwise than fail, inasmuch as it has, like most other principles of arrangement, been erroneously applied to divide *Coleoptera*, when the grand requisite must always be the natural method of uniting them. It is indeed, as I have elsewhere attempted to show†, a great error to confound the Creator's distribution of his works with our own method of dividing a subject into heads for the sake of perspicuity. That system, in short, which depends on the division of organs or properties must necessarily be artificial, while that which depends on their *method of variation* must be the natural one.

But I have now to propose a third objection to the tarsal system; an objection which will, I suspect, not a little surprise those entomologists who have been in the habit of adopting it as a convenient mode of arranging the contents of their cabinets. It is, that the very basis of this system is erroneous,

* *Gen. Insectorum*, vol. ii. p. 52.

† *Horæ Entomologicæ*, p. 454.

since

since the number of joints in the tarsi of *Coleoptera* does not vary so much as has been supposed. This, it is true, is not an objection that will much affect the series of the *Genera Insectorum*, so far as that work may relate to affinities, because it matters little whether insects are to be held together by being all pentamerous or all tetramerous; but it most seriously affects the nomenclature of the tarsal system,—since, if I place a natural group with five joints to each of the tarsi among *Tetramera*, and another with four joints among the *Trimera*, I clearly give them a false description as well as an erroneous name.

It requires little observation to perceive that Aristotle's group of *Ptilota* is typically pentamerous, or, in other words, that it has in its most normal forms five joints to the tarsus. Aberrant exceptions there are, however, to all rules of this kind; and, as we have seen above, the arrangement of *Coleoptera* given by the French school of naturalists is grounded on such exceptions. Observations universally adopted as accurate, and judged of sufficient importance to form the basis of a system, are not likely to be viewed with suspicion by young naturalists. While, therefore, on entering upon the science, I perceived that the tarsal system was at utter variance with natural affinities, I made no doubt of the statements upon which it was founded being in the main correct. It was certainly evident, as shown above, that this system, as propounded by the French entomologists, would not contain all *Coleoptera;* and, on the other hand, that Illiger and Reichenbach had even exploded the section of *Dimera;* but no one carried his scepticism so far as to express doubts of a Linnean *Cerambyx* and *Curculio* being different from a *Carabus* in being tetramerous, or of a *Coccinella* being properly separated from a *Chrysomela* in being trimerous. The study of natural affinities, however, is of that admirable nature, that, while founded on observation, like a well-proportioned build-

ing it gives superior strength and solidity to that foundation upon which it is constructed: in fact, it seems always to give rise to observations even more beautiful than those from which it has resulted. Thus it was, that in attempting a natural arrangement of the insects collected in Java by Dr. Horsfield, I discovered that the more deeply I penetrated into the science of affinities, the more broken up was the tarsal system. Still, with that respect which we naturally indulge for notions generally adopted, I have confined myself in the first number of the *Annulosa Javanica* to my individual observations*, without venturing to suppose that the French school of entomologists and their followers could be essentially wrong in the very groundwork of their favourite system. Although my confidence in the observations of these naturalists was far from being so implicit as it had been, the reader of the first sixty pages of the above-mentioned work will perceive that, instead of attacking the divisions of *Dimera*, *Trimera*, &c. generally, I contented myself with proving my affinities as it were in spite of them; as, for instance, where I admit the *Erotyli*, generally speaking, to be tetramerous, while proving their immediate affinities to be pentamerous. I had scarcely, however, corrected the press of the first number of that work, when Captain P. P. King, R.N. one of those enterprising and accomplished navigators who at the present moment confer so much honour on our country, requested me to examine the insects which he had collected during his late expedition to survey the coasts of New Holland. Among the new forms of *Coleoptera* in this collection I found a pentamerous insect, which I have since named *Megamerus Kingii*†, and

* See *Ann. Jav.* p. 40.

† For the characters of this genus and of *Carpophagus*, see *Narrative of a Survey of the Intertropical and Western Coasts of Australia, by Capt. P. P. King, R.N.* Appendix, p. 447, 448. tab. B. fig. 1 and 2.

which

which at first puzzled me not a little as to its natural affinities. On dissecting it, however, and comparing it with the genus *Sagra* on one side, and on the other with a New Holland insect allied to *Bruchus*, which, from the circumstance of its being found on plants of the genus *Banksia*, I have called *Carpophagus Banksiæ*, I ascertained in some degree its natural place. But the *Megamerus* was pentamerous; while *Sagra*, leading off to the Linnean genera *Cerambyx* and *Chrysomela*, and while *Bruchus*, leading off to *Curculio*, were both recorded as tetramerous. It was, however, observable that the tarsus of my pentamerous insect differed in no other respect from that of *Sagra* and *Bruchus;* that is, from the tarsus of the majority of M. Latreille's section of *Tetramera*. The three first joints of its tarsus were in short dilated into species of cushions, of which the last was bilobed, while the fourth joint was short, slender, obconical, and forming at first sight one piece with the fifth; so that the three first articulations formed a dilated part of the tarsus, and the two last a filiform part. Had it not been for the presence of the fourth joint and its remarkable size in the *Megamerus Kingii*, I might indeed have described its tarsus in the very words which in the *Règne Animal* are applied to this part of the foot in the Linnean groups *Curculio*, *Cerambyx*, and *Chrysomela*: "Le dessous des trois premiers articles des tarses est spongieux ou garni des brosses avec le penultième divisé profondement en deux lobes." But on examining carefully *Sagra* and *Carpophagus*, these genera will be found pentamerous in the same manner as *Megamerus*. May it not then be possible, we naturally ask, that the majority of insects hitherto called tetramerous, are in reality pentamerous insects? An accurate examination of any Linnean *Cerambyx*, *Curculio*, or *Chrysomela* will prove it to be so, and that, in fact, the accurate description of the tarsus in these three

three very natural groups is, that it consists of five articulations, of which the three first are dilated into cushions, the third being bilobed, while the two last are filiform, the fourth being very small. But if these insects be thus *pentamerous**, our attention will naturally be turned to the *Trimera* of the French school. May not they also have erroneously been described? Latreille, in characterizing the well-known genus *Coccinella* in Deterville's *Dictionnaire d'Histoire Naturelle*, says, "Trois articles aux tarses dont les deux premiers en cœur et garni des brosses." Yet on examining the *Coccinella* 12-*maculata* of Java, we clearly see that it is at least tetramerous, the two first joints of the tarsus being dilated, and the two last filiform. De Geer has even given a correct magnified figure of a similar structure of the tarsus in

* On this paper being read before the Linnean Society, a short notice of its general purport appeared in the *Philosophical Magazine* for February last; and Mr. Kirby having seen this notice, stated in the following number that he was aware of the facts given to the public in my paper. To this effect he quoted a passage from the forthcoming third volume of his *Introduction to Entomology*. However, in a subsequent communication inserted in the *Philosophical Magazine* for April, and intended to correct some mistakes of the former communication, Mr. Kirby, in speaking of the joint of the tarsus in *Coccinella* figured by De Geer, but certainly not understood by that great naturalist, says, "He (i.e. *De Geer*) regarded this joint not as a primary but as a secondary joint, or the joint of a joint, as I am disposed to do myself, and therefore, in the *Introduction to Entomology*, and upon other occasions, I speak of the *Chrysomelidæ*, &c. as tetramerous, and the *Coccinellidæ* as trimerous." As Mr. Kirby thus continues to consider the *Chrysomelidæ*, &c. as tetramerous, and the *Coccinellidæ* as trimerous, and has thus abandoned all claim to that generalization upon which the whole use and merit of this discovery, as I conceive, hinges, I have only to say, that I have not been able to discover with him that *Cassida* has the same kind of tarsus as *Cerambyx* or *Chrysomela*. In the above-mentioned passage, cited from the forthcoming volume of the *Introduction to Entomology*, Mr. Kirby says, that in the Linnean genera *Curculio*, *Cerambyx*, *Chrysomela*, *Cassida*, &c. "the claw-joint consists of two articulations." Judging from the affinity of *Cassida* to *Chrysomela*, I thought so myself at first, but I certainly have not been able to confirm this reasoning by observation.—*May* 1825.

his

his "*Coccinelle à* 15 *points noirs,*" although he considered the genus as trimerous*. And the fact is, that this truly tetramerous structure prevails, as far as I have observed, throughout all the insects hitherto called trimerous: for instance, in *Eumorphus immarginatus*, a Sumatran insect, which I more particularly specify, for the same reason as the Javanese *Coccinella*, because they are both large species in a group of which the insects are generally small, and because the tetramerous structure of their tarsus is therefore visible to the naked eye.

These very remarkable facts destroy even the very nomenclature of M. Latreille's system, and throw doubt on the description of almost every genus that is not recorded as pentamerous in the *Genera Insectorum*. In this stage of the investigation, therefore, two important questions arise, which require much more development than I am able to give them in the present crude sketch. These are, first, What coleopterous genera possess only four joints to each of their tarsi? and, secondly, Considering such tetramerous tarsi as typically pentamerous, what articulation is it that is evanescent in these genera? Such are questions intimately connected with the doctrine of natural affinities, as it relates to *Coleoptera;* and I therefore beg leave to conclude this paper with a few remarks, which may be interesting to those who may be inclined to take up the subject.

Heteromerous insects are, as before said, so called by MM. Dumeril and Latreille because they have five articulations to each of the four first tarsi, and only four to each of the two last. This, as

* In his first letter to the editors of the *Philosophical Magazine,* Mr. Kirby states, on the authority of Mr. Spence, that Müller had discovered the third joint in the tarsus of *Coccinella;* but as Mr. Kirby has not been able to refer me to the work in which Müller published this discovery respecting the *Trimera* of the French system, I can only mention the fact, contenting myself, in consequence, with having been the first to make known to the public the true construction of the tarsus in the insects called *Tetramera* by the French entomologists.—*May* 1825.

far

far as I have been able to observe, is a very accurate description of all those sand insects which are allied to *Pimelia* and *Tenebrio*. The manner, however, in which a *Helops* is heteromerous may perhaps be explained by examining the posterior pentamerous tarsus of *Erotylus;* in which case we should say that it is the penultimate joint of the tarsus that is evanescent in the *Helopidæ*. In the heteromerous *Cistelenæ* of M. Latreille we have a genus *Mycterus*, evidently allied to the *Curculionidæ;* and a very careful dissection has made it appear to me that it is in reality pentamerous, only the third and fourth joints of the posterior tarsi are nearly confluent. Hence, in heteromerous insects generally, we may perhaps suppose that it is the fourth joint of the tarsus which vanishes. I say generally, because there may be many exceptions to the rule; perhaps, for instance, *Meloe* and the insects allied to it. These are true *Heteromera;* but on looking at their posterior feet we find an obconical process, which seems to represent the lost articulation, and occasions one almost to fancy, although not perhaps very philosophically, that it is the second joint of the tarsus which articulates with the tibia. The Linnean genus *Cassida* and *Alurnus* appear to have only four joints to their tarsus, which differs moreover from that of the *Chrysomelidæ*, inasmuch as all these four articulations are dilated. The affinity of *Cassida* to *Chrysomela* shows us here also which joint is evanescent; and we find, in fact, that the last joint, although dilated at the extremity, puts on the appearance of the piece formed by the two last articulations of the tarsus in *Chrysomela*. This circumstance may serve to throw light on the structure of the foot in *Eumorphus*, and the other insects commonly but erroneously called trimerous. I have shown them to be at least tetramerous; and I conceive, from analogy, that it is the penultimate joint that is here also evanescent. But however this may be, enough has been said to prove the worthlessness of the tarsal system, even

even when we consider it in no other light than as affording means of description. As a medium for expressing natural affinities, it had already been sufficiently characterized by the learned entomologist who has been the principal source of its celebrity, when he said, "*Articulorum tarsorum progressio numerica decrescens in methodo naturali non admittenda.*" This assertion I have repeatedly proved to be true, notwithstanding its having been tacitly retracted by M. Latreille, when he brought forward this system in the *Règne Animal distribué après son Organization*. To overturn, therefore, this arrangement of *Coleoptera* altogether, and to demonstrate that it does not even possess the merit of being an accurate artificial one, it only remained to show that this numerical progression of tarsal joints does not really exist in nature, and that we have been hitherto giving those very groups of *Coleoptera*, which perhaps are most familiar to our eyes, names that in point of fact are quite erroneous.

III. *Notice on a peculiar Property of a Species of Echinus.*

By E. T. Bennett, Esq. F.L.S. Communicated by the Zoological Club of the Linnean Society.

Read June 21, 1825.

The property of forming for themselves habitations or cells in stone or other hard substances, with which Nature has endowed certain of the less perfect animals, has repeatedly excited the investigation of zoologists, who are yet divided in opinion as to the means by which it is effected. While some are disposed to regard these cavities as the result chiefly of chemical action, others consider them to be produced by mechanical powers alone. Into this extensive question it is by no means my intention to enter; I merely propose to put on record, for future and more able inquirers, a fact which has recently come to my knowledge, and which is new to those scientific friends whom I have consulted respecting it.

On the surface of a fragment of rock from the coast of the county of Clare, for which I am indebted to the kindness of Mr. J. D. Humphreys of Cork, there exist numerous depressions or cavities, occupied by a species of *Echinus*, and evidently formed by it, as they severally correspond in size with the stage of growth of their respective inhabitants. The fragment, which is about eight inches in length by six in breadth, contains in less than one half of its surface six of these cavities,—each of which is circular,—agreeing in form with that of the *Echinus* which occupies

occupies it, and so deep as to embrace more than two-thirds of the bulk of its animal inhabitant. They are large enough to admit of the animal rising in them a little, but not of its coming out easily; and their depth is in several considerably increased by the deposition, around their upper circumference, of a species of coralline several lines in thickness, and by a thin layer of which they are frequently lined throughout. In common with all the other species, the *Echini* inhabiting these cells have their mouths invariably downwards; and they adhere by their numerous suckers so firmly to the lodgements they have formed, as to be forced, with extreme difficulty, from them when alive.

"The coast of the county of Clare," Mr. Humphreys informs me, "at Milltown Malbay, and indeed from the mouth of the Shannon northward to the isles of Arran, is without a harbour, and, except a few bays of fine sand, presents to the eye the most majestic cliffs. Wherever the rocks project into the sea, so as to form ledges accessible at low water, protected in front by higher rocks, and which are never left entirely dry, these ledges are perforated by the *Echini;* and I have seen thousands of them lying in these cavities side by side. The largest which I saw thus imbedded were about three inches in diameter; and the few that I perceived out of their *nidi* were dead. All that I thus observed were of the same species. The fishermen sometimes take the common *Echinus* in their lobster-pots, but these are never lodged in the rock. I have been lately informed that they lodge in a similar manner in the rocks about Berehaven and Bantry in the west of our county (Cork), and I shall endeavour to obtain further information respecting their habits from thence."

The animal whose interesting habits have formed the subject of the

the present notice appears to be the *Echinus saxatilis* of Linnæus; but the character assigned to this species by that distinguished naturalist is so indefinite as to preclude the possibility of certainty on this point. It however coincides precisely with the description given by Leske of his *Cidaris rupestris*, and with Lamarck's specific character of his *Echinus lividus*; both of these authors (the latter with a mark of doubt) referring to this species of Linnæus as synonymous with theirs respectively. The appositeness of the trivial names both of Linnæus and of Leske to the habitat of the animal in question, might lead to the suspicion that they were acquainted with the property noticed above: but there is no reference in either of them to any author by whom it has been mentioned. Rumphius, indeed, describes the *Echinus saxatilis* as inhabiting "the holes and cavities of corals, in which they sometimes grow to such a size that it is impossible to pull them out." But these words evidently imply his opinion that it sought holes previously formed, in which it increased in bulk; and do not even hint at the conclusion, that itself formed and enlarged the cells in which it dwelt.

Whether the species of *Echinus* described and figured by Rumphius, and referred to by Linnæus as synonymous with his *E. saxatilis*, be identical with the one which inhabits the western coasts of Ireland, may probably, on account of their geographical distribution, be regarded as doubtful, the former having been discovered in the Indian Seas. The species of this genus are, however, so difficult to determine, and so little understood, that I will not at present venture to decide upon this question. If not identical, they are at least analogous; and I may mention as a fact bearing upon this point, that I have lately seen a specimen of *Echinus*, brought by Captain King, F.L.S., from New Holland,

Holland, to which it would be extremely difficult, if not impossible, to assign characters capable of distinguishing it from our common *E. esculentus*.

It may be proper to add, that the species which perforates the rocks of the western coasts of Ireland has not hitherto been described as an inhabitant of the British isles.

IV. *A Com-*

IV. *A Commentary on the Third Part of the Hortus Malabaricus.*

By Francis Hamilton, M.D. F.R.S. and L.S.

Read December 7, 1824; *and June* 21, 1825.

Codda Panna, *p.* 1. *tab.* 1—12.

In mountainous stony places of Malabar I observed the *Codda Panna* of the natives very common; but I never observed it either in flower or fruit, nor did I ever see its leaves so large as Rheede describes them. The leaves which I saw were about the size of those of the *Borassus flabelliformis;* that is, five or six feet in diameter: and it must be observed, that Rheede states that it is only when the tree is young ("antequam ullos emisit ramulos") that its leaf is fourteen feet broad and eighteen long: "folia tamen cum arbor ramos (stipites nempe) undique emittit, altiusque excrescat, sensim minora proferuntur." It is in this state alone that I remember to have seen it. In my *Journey to Mysore* (ii. 488.) I have given an account of the uses to which it is applied; and I must further observe that, notwithstanding its size and woody texture, this plant, like our annuals of Europe, produces fructification only once, and then dies; whereas many herbaceous plants, as well as trees, continue to bud and flower every year for ages.

The generic name *Panna* is not peculiar to Palms, as the author supposed; but even in the *Hortus Malabaricus* is given to several Ferns. (*Hort. Mal.* xii. 31, 35, 61, 65, 67.) It is much

much to be regretted that in the indexes to the *Hortus Malabaricus*, not only in the work itself, but in the *Flora Zeylanica* of Linnæus, and *Thesaurus Zeylanicus* of Burman, the plants have been arranged according to their specific, and not according to their generic names; for in the dialects of India, as well as in English, the specific name usually precedes the generic. There are some exceptions:—the Malabar words *Maram* signifying a tree, *Kodi* a sarmentose plant, *Valli* a climber, *Pullu* a grass, and *Maravara* a parasitical plant, are usually placed after the generic term, being properly denominations of classes or orders. In the same manner *Ghas Gaya* or *Gaha* (herba, planta) in the dialect of Ceylon is to be considered not as denoting a genus, but a class or order. Keeping this in mind, the classification of the natives may be readily discovered, and in general will be found to show a considerable accuracy of observation.

The name *Karetela*, said to be given to this palm by the Brahmans of Malabar, I cannot explain; unless we suppose it composed of two words, *Kare* and *Tela*, the former signifying wild; and the latter may be the same with *Tala* or *Tali*, the Ceylonese name. This is obviously the same with *Tal*, the name given in the north of India to the *Borassus flabelliformis*, to which the *Codda Panna* has a very great resemblance. The term *Ghas Gaya* or *Gaha*, annexed by the Ceylonese, I have already explained; but the word *Pot* added to *Tali* is the same with *Pata* or leaf, annexed because the leaf of this palm is the part most commonly used.

Commeline, in the note annexed, seems to have an unnecessary doubt in referring to the *Codda Panna* C. Bauhin's *Arbor foliis sex brachiorum longis, cujus folio extenso tres quatuorve viri in itinere operiuntur, ut pluvias non metuant.* Except in coining a new name, Ray, as usual with Indian plants, gives us no knowledge but what is derived from Rheede; and the same is

the

the case in this instance with Plukenet (*Alm.* 277.), who adopts the name given by Ray, *Palma montana folio plicatile flabelliformi maximo, semel tantum frugifera:* nor does he quote any synonyma except the *Hortus Malabaricus.*

The elder Burman (*Thes. Zeyl.* 181.) borrowed from Hermann the name *Palma zeylanica, folio longissimo et latissimo*, by no means so characteristic as that of Ray; for, as I have said, in its full growth the leaves are not remarkably larger than those of the *Borassus.*

Rumphius (*Herb. Amb.* i. 44.) compared the leaves of the *Codda Panna* with those of his *Saribus*, but says "verum tantum differt ut diversa sit habenda species." (See my Commentary on the *Herbarium Amboinense.*) Notwithstanding what Rumphius had properly observed, Linnæus in the *Flora Zeylanica* (394.) joined the *Saribus* with the *Codda Panna* to form his *Corypha:* but it was probably the latter that he meant to describe, as we have no reason to believe that the *Saribus* is found in Ceylon. In the *Species Plantarum* and Burman's *Flora Indica* (240.) no change took place, except giving to the *Corypha* the specific name *umbraculifera*, and without any good reason omitting some of the synonyma. Gærtner continued the error; nor do I know which of the fruits he described.

After this long continuance of error, the difference between the *Saribus* and *Codda Panna* was pointed out by M. Lamarck (*Enc. Meth.* ii. 130.), who considered the latter as the *Corypha umbraculifera*, and in this has been followed by Willdenow. (*Sp. Pl.* ii. 201.)

NITI PANNA, *p.* 7.

There is no figure of this plant, and the description is so imperfect that little dependence can be placed on such conjectures as I can offer. It is probably a palm growing in or close by the rivers of Malabar; and as the description says, "folia Palmæ foliis,

foliis, plane similia sunt," we may infer that its leaves have a strong resemblance to those of the *Cocos nucifera*, which by way of eminence Rheede calls *Palma indica*. On these grounds I think it probable that it may be the *Nipa fruticans* (*Willd. Sp. Pl.* iv. 597.). I did not indeed observe this in Malabar; but it is common near the mouths of the Ganges, and on the banks of estuaries in the countries and islands south and east from thence.

Todda Panna, *p.* 9. *tab.* 13—21.

The plant here described is perfectly known to me, although in Malabar the natives call it *Indu* (*Journey to Mysore*, ii. 469.); nor did I there hear of the names *Todda*, *Mouta*, or *Andexa Motha Panna*, which Rheede had received at Cochin. He fell into a great error in considering this as the *Soteetsou* of the Japanese, that is, as the tree which produces *sago*, as is very properly pointed out by Commeline in his note (*p.* 14.). Notwithstanding this, Plukenet (*Alm.* 276.) joins the *Todda Panna* with the *Palma farinifera Japonica* of Breynius, or *Soteetsou* of the Japanese, an error followed by Linnæus (*Fl. Zeyl.* 393.), when he established a new genus called *Cycas*. Concerning these errors, however, I have said every thing necessary in my Commentary on the first part of the *Herbarium Amboinense*, and I need here only insert the real synonyma of the *Todda Panna*.

Palma indica caudice in annulos protuberante distincto. *Raii Hist.* 1360.

Cycas frondibus pinnatis, foliis lineari-lanceolatis, stipitibus spinosis. *Linn. Fl. Zeyl.* 393. (exclusis nisi *Raii* synonymis omnibus).

Olus calaphoides e Celebe vel ex insulis Ulasseriensibus. *Herb. Amb.* i. 87. 89. *t.* 22. 23.

Cycas circinalis. *Burm. Fl. Ind.* 240. (exclusis synonymis *Breynii*

Breynii, *Sebæ*, et *Kæmpferi*. *Enc. Meth.* ii. 231. (excluso *Sebæ* synonymo *Sup.* ii. 425. in observatione.) *Willd. Sp. Pl.* iv. 844. *Brown Nov. Holl.* i. 347. in observatione. *Hort. Kew.* v. 409.

I have only further to add, that in the figures the rings on the stems are represented more regular and deep than I have ever observed on the growing plant, which has probably prevented Dr. Roxburgh (*Hort. Beng.* 71.) from quoting them.

KATOU INDEL, *p.* 15. *tab.* 22—25.

In India this is the most common Palm. The names *Katou Indel*, *Tamara do Muto*, and *Wild Dandel Boom* imply its being a kind of Date; and the resemblance between it and the Date-palm brought from Arabia is so great, that, except by the fruit, I could not distinguish the one from the other: but I did not see the flower of the Arabian plant. The fruits are very different in quality, but not more so than those of the Crab-apple and Pippin; yet the flower of the *Katou Indel* differs so much from that of the *Phœnix dactylifera*, at least as this is described by Linnæus, that he considered it as belonging to a different genus; for its flower has six stamina and three germina, while Linnæus believed that the Date had three stamina and one germen; and it is still thus described in the *Hortus Kewensis* and by Willdenow: but M. Lamarck (*Enc. Meth.* ii. 261.) observes that the *Phœnix dactylifera* has six stamina. He indeed describes it as having only one germen; but he has perhaps been led to do this from no more than one coming to maturity, as is the case also in the *Katou Indel*.

Neither Commeline in his note, nor Plukenet (*Alm.* 276.), seems to have been aware of the strong resemblance between the proper Date-tree and the *Katou Indel*, which they call *Palma sylvestris*

sylvestris Malabarica, folio acuto, fructu Pruni facie. The specific name *Katou* implies *sylvestris;* and *Indel* is evidently the same name with *Indi*, which, according to Plukenet (*Alm.* 277.), the natives of Ceylon give to the Date-palm. *Palma sylvestris* is therefore a translation of *Katou Indel.* The *Phœnix dactylifera*, which was the *Palma* first known to the learned of Europe, according to Plukenet is distinguished by the Ceylonese specific name *Maha* (great) prefixed to *Indi;* while he mentions another kind, called by the Ceylonese *Hin Indi*, which he describes as *Palma dactylifera minor humilis, sylvestris, fructu minore.* (*Alm.* 277.) This he considers as different from the *Katou Indel;* but the elder Burman (*Thes. Zeyl.* 183.) considered them as the same. I should have no doubt that Burman was in the right, were there not another species of thesa me genus (*Phœnix farinifera*, Hort. Beng. 73.) to which the term *humilis* is more applicable; for the *Katou Indel* is fully as large as the *Phœnix dactylifera.* Neither Plukenet nor Burman, however, says any thing specific concerning the size of the *Hin Indi;* only the term *humilis* applied to it, is used also by Plukenet for the dwarf Palm of Spain (*Chamærops humilis*), which is of a similar size with the *Phœnix farinifera*, and does not approach near in magnitude to the *Katou Indel.* I therefore refer the *Hin Indi* to the *Phœnix farinifera*, which is a very common plant on all the hilly country between the Ganges and Cape Comorin. I have, however, great doubts of the *Maha Indi* of Ceylon being the proper Date of Arabia, or of its being different from the *Katou Indel*, which I know is very common in Ceylon; but I never heard of proper Dates being produced either there or in any part of India. It is true that in the gardens of the curious I have seen a few trees imported from Arabia; but I never saw these produce fruit. It is also true that I consider the *Katou Indel* as merely the wild plant of the same species with that which is cultivated in Arabia and Africa:

but this culture has wonderfully improved the fruit; so that from being useless, as in the *Katou Indel*, it has become one of the most valuable vegetable productions.

Linnæus (*Fl. Zeyl.* 390.) however entirely adopted the opinion of Burman, and supposed the *Indi* Palm to be the same with that which produces dates, and to be so common in India that it had communicated its name to the country. This opinion, however, could only be adopted on the supposition that the *Katou Indel* is the *Indi*: but the whole hypothesis seems groundless; for in the dialects of the North of India the *Katou Indel* is called *Khajur* in the vulgar, and *Kharjuri* in the sacred dialect (*Kasouri* of the Brahmans of Malabar); and it was no doubt from some circumstance attending the North of India that the Western nations gave this name to the country. The *Katou Indel*, however, was considered by Linnæus as quite distinct from the Date-palm (*Phœnix dactylifera*), and in the *Flora Zeylanica*, 397. was called *Vaga*; but when he published the *Species Plantarum*, he changed this name to *Elate sylvestris* (*Burm. Fl. Ind.* 241.), considering it, on very slight and insufficient grounds, as the *Elate arbor* of the Romans, which was a tree used in preparing ointments, as Pliny mentions (*Nat. Hist. l.* xii. *c.* 28.), "quam alii Elatam vocant, nos Abietem, alii Palmam, alii Spathen. Laudatur Hammoniaca maxime, mox Ægyptia, dein Syriaca, duntaxat in locis sitientibus odorata, pingui lachryma, quæ in unguenta additur ad domandum oleum." The reason, probably, why Pliny calls it *Abies* is, that Ελατη was the Greek name for the Latin *Abies*: but there is no reason to suppose that this grows either in Egypt or in the Oasis of Ammon. Linnæus was therefore no doubt justifiable in rejecting this supposition of Pliny: but when he adopted the term *Palma*, used also as synonymous with *Elate* in Pliny, he should have considered that this was a generic term; and before he confounded the *Elate* with the

Katou

Katou Indel, he should have inquired whether the latter produces a gum or resin (*lachryma*), such as was used by the Roman perfumers. This being by no means the case, the name *Elate* is improperly applied to the *Katou Indel*.

Willdenow however (*Sp. Pl.* iv. 403.), and the *Hortus Kewensis*, v. 280, continue to describe the *Katou Indel* as the *Elate*, a genus distinct from the *Phœnix*, and place it in *Monœcia hexandria*, probably because Rheede figures and describes only the female tree, the *tria albicantia lanuginosa staminula*, which he mentions, being the three pistilla. M. Lamarck (*Enc. Meth.* iii. 244.), although he continues to describe it as the *Elate sylvestris*, observes, "C'est un Palmier qui nous paroit extrèmement voisin du Dattier (*Phœnix dactylifera*) par ces rapports, et dont même il est peut-être une espèce." The only doubt I have is, whether or not it is to be considered as any thing else than merely the uncultivated variety of the *Phœnix dactylifera*. Dr. Roxburgh indeed, an excellent authority, mentions (*Hort. Beng.* 73.) both a *Phœnix dactylifera* and a *P. sylvestris*; which last I know to be the *Katou Indel*, although he does not quote it, deterred by the authority of so many great botanists: but then in this catalogue he inserts, under distinct names, plants which he admits to be mere varieties; as for example, the *Musa sapientum* and *M. paradisiaca*, *p.* 19: and I must say, that looking with the utmost care at the common plant of India, and that known to have been brought from Arabia, like those in the garden of the late Tippoo Sultaun, when in a similar state of growth,—that is, when the stems were only a foot or two in height, and before they began to flower,—I have not been able to see the smallest difference between them, except that the plant of Arabia was rather the largest and more vigorous. With such an extraordinary similarity, I should be very much indeed surprised to find that the proper Date of Arabia had only one pistillum; but if this be the case, we must admi the

species

species to be distinct. In the mean time I shall describe the *Katou Indel*, so that those who have an opportunity may compare the description with the *Phœnix dactylifera*. For an account of the uses to which the *Katou Indel* is applied, I may refer to my *Journey to Mysore* (i. 54, 56, 393; iii. 320.).

Caudex arboreus, diametro pedali, 10—20 pedes altus, teres, rudimentis stipitum imbricatis undique exasperatus, indivisus. *Frondes* plures terminales, confertæ, patentes, pinnatæ. *Pinnæ* sparsæ, 6—8 hinc inde approximatis squarrosæ, decurrentes, lanceolatæ, integerrimæ, acutæ, glabræ, nervis pluribus longitudinalibus striatæ, rigidæ, ima parte complicata in rachim insertæ; inferiorum nonnullæ subtrigonæ, canaliculatæ, mucronato-pungentes. *Stipites* ad foliola brevissimi, basi dilatato amplexicaules. *Rachis* trigonus, latere inferiori convexo; superioribus, quibus pinnæ adnascuntur, planis. *Stipulæ* intrafoliaceæ, fibris decussantibus intertextæ.

Flores dioici.

Masculinæ arboris:

Spadix axillaris, solitarius, erectus, palmaris, planus, lævis, truncatus, ultra medium extra tectus spicis plurimis in capitulum hemisphæricum magnitudine capitis humani congestis. *Pedunculi* glabri, angulati, flexuosi. *Flores* glabri, nitidi, albidi, sparsi, magni.

Calyx concavus, tridentatus. *Petala* tria, ovata, acuta, rigida, patentia, angulata, calyce multo longiora. *Filamenta* sex, brevissima, receptaculo carnoso parvo inserta. *Antheræ* filiformes, spirales, petalis breviores.

Fœmininæ arboris:

Spadix tectus spicis plurimis, longissimis, erectis, simplicissimis, glabris, flexuosis, angulatis. *Flores* plures, sparsi, sessiles.

Calyx

Calyx monophyllus, ore tridentato cyathiformis. *Petala* tria, subrotunda, in globum ore patulo convoluta. *Germina* tria, oblonga. *Styli* subulati. *Stigmata* acuta.

Drupa, vel potius forte *bacca* (germinum duobus abortivis), solitaria, ovata, Dactylo Arabico dimidio minor, flava, mollis, carnosa, calyce persistente infra cincta. *Cortex* membranaceus, tenuissimus. *Caro* crassiuscula, dulcedine quadam austera.

I may here observe that, besides the *Katou Indel*, I have seen in India three other species of the same genus; one of them a small tree, and the other two without stems. Of these last, one, which I have already mentioned, is common in all the hills of India south from the Ganges, and is what Dr. Roxburgh (*Hort. Beng.* 73.) calls *Phœnix farinifera*; and I think that this is probably the *Hin Indi* of the Ceylonese, and the *Palma dactylifera minor humilis sylvestris fructu minore* of Parkinson, Plukenet, and Burman. In the North of India this is called *Palawat*; and its leaves, which are not so rigid as those of the other species, are bruised and twisted into ropes. Its fruit is supported on a stem almost as long as the leaves (*frondes*).

The other dwarf *Phœnix* is found in the more elevated plains on the north side of the Ganges, where the soil contains much clay, and in the dialect of Bengal is called *Janggali Khajur*; and it is, I presume, what Dr. Roxburgh (*Hort. Beng.* 73.) calls *Phœnix acaulis*. Either the *Phœnix acaulis* or *P. farinifera*, there can be little doubt, is the same with the *P. pusilla* of Gærtner (*De Sem.* i. 24. *t.* 9.). The plant found on the north side of the Ganges is the smallest, and therefore the most suitable for the name *pusilla*; but then Gærtner procured the seeds from Ceylon, where it is probable that the plant of Southern India is alone known. He describes, however, only the fruit; and from that

that only the species, I suspect, cannot be fully determined; which probably induced Dr. Roxburgh to give new names to both plants, although it is probable that his *P. farinifera* is the *P. pusilla* of Gærtner. I shall here give a description of the *Phœnix acaulis*, or *Janggali Khajur* of the Bengalese.

Radix fibrosa, crassa. *Caudex* nullus. *Stipites* plures cum stipulis congesti in bulbum imbricatum vix extra terram emergens, rigidi, brevissimi, trigoni, subtus convexi. *Frondes* pinnatæ, rarius ultra cubitum longæ. *Pinnæ* hinc inde 3—5 approximatis squarrosæ, ima parte complicata in rachim insertæ, lineares, nudæ, nervis longitudinalibus parallelis striatæ, rigidæ, apice spinescentes, inferioribus brevissimis. *Rachis* communis trigonus. *Stipulæ* geminæ, laterales, maximæ, membranaceæ, margini stipitis utrinque longitudinaliter adnatæ, nervis intus reticulatæ.

Flores dioici.

In masculina arbore:

Spadix erectus, e terra exsertus, ramis simplicibus confertis angulatis multifidus. *Spatha* membranacea, marcescens, vaginans, indeterminatè dehiscens. *Flores* duri, angulati, lutei.

Calyx minutus. *Petala* tria, rigida, oblonga, acuta. *Filamenta* nunc tria tunc sex, brevissima. *Antheræ* oblongæ.

In fœminina arbore:

Inflorescentia ut in masculina, sed spadix vix apice e terra emergens. *Flores* virides, squama rigida parva adpressa bracteati.

Calyx monophyllus, crassus, truncatus. *Corolla* rigida, laciniis ovatis obtusis adpressis trifida. *Germina* tria, ovata; quorum duo semper abortiva, cito marcescentia. *Stylus* vix ullus. *Stigmata* acuta.

Bacca oblonga, acuta, nigra, carnosa, mollis, dulcis, pollicem transversum vix longa, calyce multo major. *Semen* oblongum,

longum, obtusum, basi emarginatum, hinc sulco profundo, inde papillula pallida notatum. *Integumentum* membranaceum. *Albumen* cartilagineum, non ruminatum. *Embryo* dorsalis, ovatus, albus.

Tsjaka Maram seu Jaca seu Jaaca, *p.* 17. *tab.* 26—28.

For what I have to say concerning this tree I may in a great measure refer to my Commentary on the first volume of the *Herbarium Amboinense*, the *Jaca* being identically the same with the *Saccus arboreus major* of Rumphius. With this author one might be inclined to think that *Tsjaka* or *Jaca* are derived from the Dutch word *Zak*, signifying a sack,—the fruit resembling a bag filled with seeds; for the tree or fruit is by no means called *Jaka* in the Hindustani language, as Rumphius supposed: but in that dialect it is called *Kantal* and *Punas*, from *Panasa* of the sacred language; and this is the same word with *Ponossou*, which according to Rheede is used by the Brahmans of Malabar. *Pilau* is therefore perhaps the proper Malabar name? It must however be observed, that the natives of Malabar have another tree called *Katou Tsjaka* (*Hort. Mal.* iii. 29.), or the wild *Tsjaka*, which has some resemblance to the *Tsjaka* or *Artocarpus integrifolia*; but its fruit does not resemble a sack: and this would seem to show that *Tsjaka* is a generic word not derived from the Dutch. By the Burmas this tree is called *Pi-næh*.

Ata Maram, *p.* 21. *tab.* 29.

In my Commentary on the *Herbarium Amboinense* (i. 138.) I have said what occurs to me concerning this plant. The names *Ata* and *Atoa*, in general use over India, seem to be derived from the *Atas* of the Portuguese, by whom probably this fine fruit was introduced into India.

ANONA MARAM, *p.* 23. *tab.* 30. 31.

In the Commentary on the *Herbarium Amboinense* (i. 136.), when treating of the *Anona*, I have said all that occurs to me as necessary concerning this plant. From a slight resemblance in the fruit, this and the preceding tree have been erroneously classed by the Brahmans of Malabar with the *Artocarpus* in the genus *Ponossou*.

ANSJELI, *p.* 25. *tab.* 32.

In the Commentary above mentioned (i. 109.), when treating of the *Angelyquen*, I have mentioned all that appears necessary concerning this tree, which the Brahmans most properly class with the *Artocarpus* or *Ponossou*, giving this the specific name *Pata* (small), which in the plate is wrongly engraved *Pala*.

KATOU TSJAKA, *p.* 29. *tab.* 33.

This is the plant which I mentioned in the Commentary on page 17 as having been considered by the natives as belonging to the same genus with the *Artocarpus integrifolia*; no doubt a very rude arrangement, as Commeline in his subjoined note remarks.

Plukenet formed a much more accurate conjecture (*Alm.* 47. & 203.) in classing it with his *Arbor Americana triphylla, fructu Platani quodammodo æmulante* (*Phyt. t.* 77. *f.* 4.); which in another place (*Alm.* 336.) he calls *Scabiosa dendroides Americana, ternis foliis circa caulem ambientibus, floribus ochroleucis*, which is the *Cephalanthus occidentalis*. Linnæus accordingly in the *Flora Zeylanica*, 53, called this plant the *Cephalanthus foliis oppositis*. He afterwards, however, considered that its having five stamina was a ground sufficient for separating it from the *Cephalanthus*, which has only four; and therefore in the first edition of the *Species Plantarum* he called it *Nauclea orientalis*, in which

which he was followed by Burman (*Fl. Ind.* 51.), who added to the synonyma the *Bancalus* of Rumphius (*Herb. Amb.* iii. 84. *tab.* 55.). Now in this plate there are two figures; of which the first represents (setting aside the errors in the direction to the plate) the *Bancalus mas et parvifolia*, which may perhaps be considered as the same with the *Katou Tsjaka*, although this is by no means clear. Without any attention to the fact of two plants being figured in *tab.* 55 by Rumphius, and laying aside his usual accuracy, M. Lamarck quotes the *Bancalus* (*tab.* 55.) for his *Cephalanthus chinensis* (*Enc. Meth.* i. 678.), leaving it doubtful whether or not the *Nauclea orientalis* is different; but he does not quote the *Katou Tsjaka*. Afterwards M. Poiret does not diminish the confusion by giving us a *Nauclea orientalis*, for which he quotes the *Cephalanthus chinensis*, the *Cephalanthus* of Linnæus, and *Bancalus* of Rumphius with doubt, while he refers the *Katou Tsjaka* to his *Nauclea citrifolia* (*Enc. Meth.* iv. 435.), distinguishing this from his *N. orientalis* by its having the pedunculus shorter than the flower; while in his *N. orientalis* this member is much longer, as represented by M. Lamarck (*Ill. Gen. t.* 153. *f.* 1.). Still later, M. Poiret endeavours (*Enc. Meth. Sup.* iv. 63.) to point out differences between his *Nauclea orientalis* and *Cephalanthus chinensis*, which is the *Nauclea purpurea* of Roxburgh and Willdenow (*Sp. Pl.* i. 928.). Now all this seems wrong: for the *Katou Tsjaka* is the *Nauclea orientalis* or *Cephalanthus foliis oppositis* of Linnæus; and the *Nauclea citrifolia*, like this having a short pedunculus, is the real *Nauclea orientalis*; while the *N. orientalis* figured by M. Lamarck must be considered as a new species, and from the size and shape of its leaf might be called *N. citrifolia*, were it not for leading into error. Besides, before we can safely refer the *N. purpurea* or *Cephalanthus chinensis* to the *Bancalus* (*tab.* 55.), we must know whether the first or second figure of Rumphius is meant. Neither

can, with any certainty, be said to represent the *Katou Tsjaka*, both having the pedunculus much too long, and therefore both agreeing with M. Lamarck's figure: yet, as the second figure in Rumphius resembles most M. Lamarck's figure, I should quote for his *N. orientalis* the *Bancalus media* (*Herb. Amb.* iii. 84. *t.* 55. *f.* 2.)

When I returned from Ava to Calcutta (1796), I know that Dr. Roxburgh considered the *Katou Tsjaka* as the *Nauclea orientalis*, and under that name sent it to the Kew Garden, where it still remains (*Hort. Kew.* i. 366.): but Dr. Roxburgh has since (*Hort. Beng.* 14.) left out altogether the *N. orientalis* and *Katou Tsjaka*; and the plant which he and I considered as such, or at least one very like it, he calls *Nauclea Cadamba*. For this he may have had different reasons. In the first place, Gærtner (*De Sem.* i. 151. *t.* 30. *f.* 8.) has, I have little doubt, described the fruit of Dr. Roxburgh's *Nauclea parvifolia* (*Hort. Beng.* 14.) as that of the *N. orientalis*. The synonyma, however, which he quotes are totally erroneous: for his plant has sessile capitula; but those of both *Katou Tsjaka* and *Bancalus* are pedunculated. In the next place, although I think it probable that the *Katou Tsjaka* is called *Kadam* in the vulgar, and *Kadamba* in the sacred dialect of Gangetic India; and although, no doubt, Dr. Roxburgh's *Cadamba* is the same word, yet the same names are given to what I take to be the *Arbor noctis* s. *Bancalus fœmina et latifolia* of Rumphius (*Herb. Amb.* iii. 84. *t.* 54.), which although very like indeed to what I consider as the *Katou Tsjaka*, yet has a fruit which can by no means be reconciled with the description given by Rheede, who says, "fructus globosi virides sunt, qui dein rubicundi, tandemque nigricantes et fragiles evadunt; et si asperius tractentur, facile solvuntur, ac in plures oblongos virides nitentes folliculos secedunt." Now I think that the *folliculi nitentes* imply capsules, such as described by Gærtner, although they

they may be covered by an acid cortex ("sapor in cortice acidus," *H. M.*); but in the *Kadamba*, which I take to be the *Arbor Noctis*, there is not a vestige of capsules, and the fruit is composed of berries of a soft substance throughout. Unfortunately I have not seen the fruit of the *Kadamba*, which I think nearest allied to the *Katou Tsjaka*, and therefore I cannot say whether, like the *Arbor Noctis*, it is composed of berries, or whether, like the *Katou Tsjaka*, it is composed of *capsulæ corticatæ*. There is one circumstance, however, which induces me to suppose that this *Kadamba* is not the *Katou Tsjaka*. This in the figure of the *Hortus Malabaricus* is represented with the stylus no longer than the tube of the corolla; but in our *Kadamba* it is longer than the laciniæ. Although it has a similar stylus, it is quite different from the *Cephalanthus chinensis* (*Enc. Meth. Sup.* iv. 63.), which has violet-coloured flowers, a truncated calyx, and the stamina included within the tube of the corolla. These differences between the *Kadamba* and *Katou Tsjaka*, however, are minute; nor do I know that they are constant, even in the same individual at different periods of growth; and therefore I must leave the matter to be finally determined by those who have leisure to examine the plants in all their stages when cultivated. Should the fruit of both *Kadambas* be similar, I should have no doubt that they are mere varieties; that both should be referred to the *Nauclea Cadamba* of Roxburgh, and to the same genus with the *Arbor Noctis* of Rumphius, which I call *Cadamba nocturna;* and that they are both different from the *Katou Tsjaka*, which is a real *Nauclea* or *Cephalanthus*, for these genera are essentially the same. In the mean time I shall give an account of this *Kadamba*, which is most like the *Katou Tsjaka*, premising that I am uncertain whether it be this or the other plant of the same name that Dr. Roxburgh called *Nauclea Cadamba*. Specimens of the plant which I mean, are to be found in the collection

tion which I presented to the library at the East India House (No. 706).

Nauclea? orientalis. *Hort. Kew.* i. 366? *Willd. Sp. Pl.* i. 928.
Nauclea Cadamba. *Hort. Beng.* 14?
Nauclea citrifolia. *Enc. Meth.* iv. 435?
Cephalanthus foliis oppositis. *Linn. Fl. Zeyl.* 53?
Bancalus mas et parvifolia. *Herb. Amb.* iii. 84. *t.* 55. *f.* 1?
Katou Tsjaka. *Hort. Mal.* iii. 29. *t.* 33?
Kadamba Sanscritæ.
Kadum Hindice et Bengalensium.

Habitat in Indiæ aridioris sylvis.

Folia oblonga, utrinque acuta. *Flores* odore gravi flavi, pistillo albido. *Bracteæ* nullæ. *Pedunculus* mediocris, crassus. *Capitulum* magnitudine Pomi minoris globosum.

Calyx longitudine dimidii tubi corollæ ultra medium quinquefidus, laciniis linearibus concavis obtusis. *Filamenta* longitudine fere antherarum ad medium adnata. *Antheræ* exsertæ. *Stylus* corollæ tubo multum longior. *Stigma* oblongum, utrinque acutum.

Leaving the other *Kadamba* to be described in a Commentary on the *Arbor Noctis* of Rumphius, I shall here give some account of the tree which Gærtner seems to have confounded with the *Katou Tsjaka*, and of which specimens have been deposited in the library at the India House (No. 705). Others were sent home from Ava under the name of *Nauclea odoratissima*, and are now probably in the collection of the late Sir Joseph Banks. From Dr. Roxburgh I know that this is his *Nauclea parvifolia*.

Nauclea parvifolia. *Hort. Beng.* 14. sed nescio an Willdenovii (*Sp. Pl.* i. 929. et *Enc. Meth. Sup.* iv. 63.), cui calyces quinquedentati acuti.

Nauclea

Nauclea orientalis. *Gært. de Sem.* i. 151. *t.* 30. *f.* 8. (exclusis synonymis.)
Thein Burmanorum.
Habitat ubique in Indiæ aridioris sylvis.

Arbor inter elatiores recta, cortice lævi, materia firma. *Ramuli* nudi, tetragoni, obtusanguli. *Folia* opposita, basi nunc acutiuscula, tunc sæpius obtusa, vel etiam retusa, apice obtusiuscula, juniora subpubescentia, maturitate glabra, costis parallelis approximatis lineata, integerrima. *Petiolus* teres, canaliculatus, brevissimus, pubescens. *Stipulæ* interfoliaceæ oppositæ, caducæ, obovatæ, dorso carinatæ, petiolis longiores, nudæ, integerrimæ.
Capitulum magnitudine Pruni terminale, subsessile. *Flores* odorati, subherbacei, bracteis apice incrassato obtusissimis, calyce longioribus interstincti.
Calyx omnino truncatus. *Corolla* infundibuliformis, quinquefida. *Antheræ* ex apice tubi exsertæ, subsessiles. *Stylus* corollæ laciniis longior. *Stigma* capitatum, obtusum, oblongum.
Fructus a Gærtnero bene descriptus.

Pela, *p.* 31. *tab.* 34.
Malacka Pela, *p.* 33. *tab.* 35.

These trees no doubt came originally from the West Indies, although the second is supposed in Malabar to have come from Malacca or China, probably because it came from Mexico by the route of the Philippines. The name *Pela* is evidently a corruption of *Pera*, the term used by the Brahmans, which again is the same with the *Peyara* of the Bengalese, both no doubt derived from the *Peera* of the Portuguese. I mention this, lest the word *Pela* (so unlike *Guajava*, the original name of

of the trees) should be supposed to indicate them to be plants indigenous to Malabar. *Pera* was probably corrupted into *Pela*, because these trees had a considerable resemblance to that which will be next described.

Plukenet (*Alm.* 181.) justly considers both the plants of Rheede as mere varieties of one species differing in the colour and size of the fruit, a distinction that was adopted by Dr. Roxburgh; but Rheede and Linnæus seem rather to have founded the distinction on the shape of the fruit, and erroneously held them to be distinct species. I may however refer to my Commentary on the first volume of the *Herbarium Amboinense* (*p.* 140.) for what further I have to say concerning these plants.

PELOU, *p.* 35 *t.* 36.

The natives of Malabar call this also *Katou Pela;* and in fact it has a considerable resemblance to the *Psidium*, as Rheede and his commentator observe, although it is more nearly allied to the 2nd division of Jussieu's *Myrti*, especially to the *Pirigara* or *Gustavia;* for according to Gærtner (*De Sem.* ii. 264.) it is not yet ascertained that the *Pirigara* wants the albumen. This organ the *Pelou* decidedly has; and on this account it may be doubted if it might not rather be classed with the 2nd division of Jussieu's *Guaiacanæ*, although its petala are quite distinct.

Although one of the most common and generally diffused trees in India, no notice, so far as I know, was taken of it by European botanists until 1800, when I went to Mysore; and on my return in 1801 showed it to Dr. Roxburgh, who in the following year procured plants from Colonel Hardwicke (*Hort. Beng.* 52.), and described it under the name of *Careya arborea*, calling it after the missionary of that name, most justly entitled to the honour by his diligence and knowledge of botany, although I had previously called it *Cumbia*, and under this name

gave

gave specimens and a drawing to Sir J. E. Smith, to whom also I at the same time gave specimens of a dwarf species of the same genus, which Dr. Roxburgh calls *Careya herbacea*, and specimens of the latter are also lodged in the library at the India House.

The following is a description of the *Pelou*, which I do not find mentioned in any author since the time of Rheede; nor does Dr. Roxburgh quote it for his *Careya arborea*, deterred probably by the figure having been taken from a plant with old worm-eaten decayed leaves, in which the serratures are badly represented: but Rheede expressly says "folia in ambitu crenata;" and it must be observed, that he properly represents the leaves on a different branch from the flowers; for in the cool season the tree loses the greater part, or even the whole of its leaves and flowers in spring, before the fresh leaves open; so that it is only a rare branch that can then be found with any leaves, and these generally old, withered, and gnawed by insects.

Careya arborea. *Roxb. Hort. Beng.* 52.
Pelou. *Hort. Mal.* iii. 35. *t.* 36.
Kumb Bengalensium.
Kumbi Hindice.
Cumbia Coneanæ. *Buchanan's Mysore* iii. 187.
Paylay Tamulorum.
Gaula Carnatæ.
Habitat ubique in Indiæ sylvis.

Arbor inter minores ligno fœtido. *Rami* cicatricibus foliorum exasperati. *Folia* alterna, apices versus ramulorum congesta, decidua, obovata, minute serrata, nervo medio subtus carinato-costata, venosa, nuda (Rheedius habet lanuginosa). *Petiolus* brevissimus, trigonus, acutangulus, marginatus, non stipulaceus.

Flores sex seu septem, magni, albi, subsessiles, alterni prodeunt e ramulorum apice ante folia, quæ postea intra flores erumpunt; unde flores terminales, fructus laterales. *Bracteæ* ad singulos flores ternæ, oblongæ, obtusæ, calyce paulo breviores, persistentes.

Calyx superus, quadripartitus, laciniis subrotundis, concavis, ciliatis, prope fundum disco erecto integro cinctus. *Petala* quatuor, coriacea, oblonga, calyce multo longiora, ciliata, oblique revoluta, extra discum inserta. *Filamenta* plurima, indefinita, subulata, multiplice serie disco inserta, basi coalita, interioribus brevissimis, et intermediis tantum antheriferis inæqualia. *Antheræ* oblongæ. *Germen* turbinatum, disco concavo tetragono coronatum, quadriloculare. *Stylus* teres, longitudine staminum, rectus. *Stigma* subrotundum, quadrilobum.

Bacca oviformis, lævis, calyce supero persistente umbilicata, carnosa, filamentosa, septis fere evanescentibus, sed seminibus quadrifariam approximatis, et carne interstinctis obsolete quadrilocularis. *Receptaculum* nullum. *Semina* plura, nidulantia, compressa, glabra, hinc hylo derasa. *Integumentum* coriaceum, crassum. *Albumen* album, forma seminis, carnosum. *Embryo* recta, teres, utrinque acutiuscula, longitudine albuminis centralis.

COVALAM, *p.* 37. *tab.* 37.

In a Commentary on the *Herbarium Amboinense* (i. 197.) I have said every thing that seems necessary concerning this plant. The name *Belou*, given by the Brahmans of Malabar, is evidently the same with the *Bel* of the Bengalese dialect, as the commentator justly observes; and *Scrifole* is his orthography for what I write *Sri-phul* (the holy fruit).

SYALITA,

SYALITA, *p.* 39. *tab.* 38, 39.

I suspect that Rheede has here made a transposition of names, and that the Malabars call this tree *Karinbalapala*, while it is the Brahmans who call it *Syalita;* for these persons usually seem to employ Hindwi names; and *Chalta*, evidently the same with *Syalita*, is the name used in the North of India. Besides, *Karinbalapala* savours of Malabar barbarism.

Strange to say, Plukenet (*Mant.* 124.) confounded this with the *Artocarpus* of the islands in the Pacific Ocean, and gave an account from Dampier very applicable to the *Artocarpus*, but totally at variance with that of Rheede. We may presume, therefore, that he knew neither plant except from the descriptions of the authors quoted. Ray gave the *Syalita* a new name; but, as usual with Indian plants, borrowed all that he says from Rheede.

Rumphius (*Herb. Amb.* ii. 141. *t.* 45.) described what he calls *Songium*; and Burman in the annexed observation considers this, if not quite the same, as at least a species of the same genus; although Rumphius himself rather considered his *Songius* as being the same with the *Syalita*. In this however he was evidently mistaken, as the *Songius* has several flowers on each pedunculus. In the first edition of the *Species Plantarum*, therefore, Linnæus without any doubt united the *Songium* and *Syalita*, under the name of *Dillenia indica* (*Burm. Fl. Ind.* 124.). Thunberg, however, (*Linn. Trans.* i. 200.) considered them as distinct species, calling the *Syalita*, *Dillenia speciosa*, and the *Songium*, *D. elliptica;* but the only difference, which he marks, is, that the former has *folia oblonga, rotundato-acuta*, while the latter has *folia elliptico-ovata, acuta*. These differences are not well defined; and I must confess myself unable to comprehend what a *folium rotundato-acutum* means. From the notes subjoined

joined it would however seem to be the same with *folium obtusum cum acumine;* but in looking at Rheede's figure there is no such appearance, and the leaves of the *Syalita*, as figured in the *Hortus Malabaricus*, are more clearly marked as *elliptica*, than those of the *Songium*, which are nearly *lanceolata*. On the whole, after comparing the descriptions of Rheede and Rumphius with a plant very common in India, I can see no essential difference, and therefore adhere to the opinion of Linnæus, in considering the *Syalita* and *Songium* as one plant. Willdenow however (*Sp. Pl.* ii. 1251, 1252.) and M. Poiret (*Enc. Meth.* vii. 150, 151.) adopt the opinion of Thunberg, but entirely on his authority, neither of them having seen the plant.

I shall here take an opportunity of describing three Indian *Dillenias*, although each may have been already described; for it is of advantage to have accounts from different persons, and I have deposited specimens in the library at the India House.

1. Dillenia pentagyna. *Willd. Sp. Pl.* ii. 1251. *Hort. Kew.* iii. 329. *Hort. Beng.* 43. *Enc. Meth.* vii. 150.
   Ban' Chalta Hindice.
   Habitat in Indiæ aridioris sylvis.

Arbor mediocris. *Ramuli* crassi, teretes, cicatricibus lunatis exasperati. *Folia* decidua, post flores Junio erumpentia, conferta, alterna, oblonga, basi acutiuscula, apice nunc obtusa, tunc acuta, supra pilis incumbentibus aspersa, subtus nuda, costata, venis minutissime reticulata, apicibus costarum prominentibus dentata. *Petiolus* amplexicaulis, brevissimus, margine membranaceo basin versus dilatatus, supra concavus, non stipulaceus.

Gemmæ florales supra cicatrices petiolorum anni præteriti enatæ, squamosæ, pubescentes, multifloræ. *Pedunculi* plures, congesti, uniflori, teretes, glabri, longitudine floris. *Bracteæ* nullæ,

nullæ, nisi gemmarum squamas volueris. *Flores* odorati, magnitudine florum Mali, flavi, ante folia vere prodeuntes. *Calyx* quinquepartitus, laciniis patulis, crassis, ovalibus, concavis, obliquis, imbricatis, apice subciliatis. *Petala* quinque, calyce duplo longiora, obovata, undulata, tenuia, caduca. *Filamenta* plura, linearia; exteriora indefinita, brevissima, incurva; interiora decem, elongata, apice recurva; antherarum loculi bini lineares, apicibus filamentorum longitudinaliter adnati. *Germina* quinque, conica. *Styli* totidem subulati, recurvi. *Stigmata* simplicia, acuta. *Fructus* magnitudine Cerasi majoris, globosus, basi umbilicatus, glaber, flavus, constans e calyce succulento, clauso, imbricato, capsulas tegente quinque conniventes, succulentas. *Semina* in singulis capsulis duo vel tria, angulata.

Like all the other species of this genus the young plants have enormously large leaves, such as are well described by Rumphius in treating of the *Songium*. The only other genus, at least among the *Dicotyledones*, that is equally remarkable in this respect, so far as I know, is the *Artocarpus*, in which the leaves of the young plants are not only of an enormous size, but of quite a different shape from those of the adult.

2. Dillenia aurea. *Enc. Meth. Sup.* v. 145?
Dhengr Hindice.
Habitat in Mithilæ sylvis ad Nepalæ limites.

Arbor magna ramis crassis cicatricosis, ramulis nudis. *Folia* alterna, decidua, oblongo-ovata, basi sæpius obliqua, nervorum apicibus productis denticulata, acuta, nervis parallelis ultra medium simplicissimis costata, venis parallelis reticulata: juniora utrinque pilis mollibus brevibus pubescentia. *Petiolus* amplexicaulis, semiteres, margine acutissimo membranaceo auctus, non stipulaceus.

Gemma

Gemma terminalis, imbricata, squamis quatuor vel sex coriaceis obtusis, quibus reflexis prodit pedunculus unus crassus nudus obtusangulus uniflorus, et ex hujus latere ramulum foliosum foliis equitantibus post florescentiam explicatis. *Flores* Dilleniæ speciosæ iis paulo minores, flavi.

Calyx monophyllus, patulus, crassus, ultra medium 5—7-fidus laciniis concavis, obtusis, margine tenuiore ciliato obliquis, imbricatis. *Petala* tot quot calycis laciniæ obovatæ, calyce multo longiora, plicata, venosa, ungue crasso in discum hypogynum planum inserta. *Filamenta* plura, indefinita, subulata, disco inserta quorum exteriora erecta breviora, interiora apice recurva; antherarum loculi discreti, margini utroque filamenti longitudinaliter adnati, ejusque plusquam dimidium occupantes, apice dehiscentes. *Germina* octo vel novem, coalita in corpus ovatum glabrum, sulcis interstincta. *Styli* totidem subulati, recurvi, supra sulco exarati. *Stigmata* acuta, simplicia.

Fructus magnitudine Pomi minoris, lævis, odore Mangiferæ, flavus, subrotundus, constans e capsulis baccatis tectis calyce clauso, imbricato, carnoso, succo viscido scatente. *Capsulæ* octo vel novem circa receptaculum commune centrale confertæ, parietibus mollibus baccatæ, vix dehiscentes. *Semina* nonnulla angulo interiori capsularum insidentia, obovata.

I am uncertain whether or not this be the plant meant by M. Poiret, as I have not at hand the *Exotic Botany* of our worthy President, which contains a figure of the *Dillenia aurea*.

3. Dillenia pilosa. *Hort. Beng.* 43?
Daine Oksi Bengalensium.
Habitat in Camrupæ montibus.

Arbor magna. *Rami* teretes, pubescentes, cicatricibus exasperati.

rati. *Folia* alterna, oblonga, apicem versus latiora, utrinque acuta, costarum apicibus productis denticulata, costis et nervis parallelis ad angulos rectos se intercipientibus reticulata, utrinque scabra, subpubescentia. *Petiolus* basi dilatatus, compressus, supra planus, marginatus, brevissimus, pubescens, non stipulaceus.

Pedunculi uniflori, e gemmulis anni præteriti lateralibus sæpius ternati, teretes, glabri, flore breviores, quorum unus sæpius longior, medio foliolis oblongis obtusis duobus vel tribus bracteatus, infra bracteas pilosus. *Flores* Calthi magnitudine, flavi.

Calyx quinquepartitus, laciniis oblongis, obtusis, concavis, patentissimis, apice subciliatis, duplice serie positis. *Petala* hypogyna, patentissima, unguiculata, calyce duplo longiora, tenuia, undulata, oblonga, obtusa, obliqua. *Filamenta* plura, quorum exteriora patentissima, decem interiora erecta. *Antheræ* lineares, utrinque dehiscentes, exteriores assurgentes, interiores stellatim patentes. *Germina* supera quinque. *Styli* totidem breves. *Stigmata* antherarum interiorum situ et magnitudine similia.

Capsulæ quinque, tectæ calyce clauso cerasiformi, intus humore crystallino scatente.

I only judge this to be the *Dillenia pilosa* of Dr. Roxburgh from its having been brought from Goyalpara by Mr. R. Kyd, who in 1810 was, on my representation, sent to examine the forests in that vicinity, and who was especially directed to inquire after the *Daine Oksi*, as specimens of its timber which I had sent to Calcutta were found to possess valuable qualities. It is likely, therefore, that he would send growing plants to the Botanical Garden.

The genus *Dillenia* is one of the most natural and well-defined

that

that I know; yet in the number of parts, and even structure of the most essential organs, such as the antheræ, there are great differences existing between different species; which shows the impropriety of founding new genera on differences of number, or even of structure in minute parts, however essential, where there are no corresponding differences in habit or general appearance.

BLATTI, *p.* 43. *tab.* 40.

Both Rheede and his commentator considered this as a species of *Eugenia*, to which it no doubt has some affinity, although this is not very striking. No further notice, except a slight one by Camelli published by Ray, was taken of this plant, until Rumphius described it under the name of *Mangium caseolare* (*Herb. Amb.* iii. 111.), without however noticing its being the *Blatti* of Rheede. This, indeed, is done in the observation annexed by Burman, 113, who says that Rumphius noticed the identity of the plants; but I have not discovered where he says so. Rumphius divides the *Mangium caseolare* into two kinds; *album*, figured in *tab.* 73, and *rubrum*, figured in *tab.* 74. The only difference, however, which he mentions is, that the former has round, and the latter quadrangular branches: "Ejus (*M. cas. rubri*) ramuli non sunt rotundi, sed quadrati, et quasi alati, ita ut oras gerant acutas:" and in fact the figure (74.) represents the branches of this form, while in *tab.* 73 they are round. This difference, I suspect, is not to be relied upon as sufficient; for in the plants which I have seen, both on the banks of the Ganges and of the Erawadi, the description of Rheede is perfectly applicable: "Rami et surculi teneriores quadranguli—vetustiores vero alis privati ac rotundiores," as may be observed in the specimens from the Ganges which I have deposited in the library at the India House. One circumstance, however, might seem to indicate some difference between the plants of Rheede and Rumphius.

phius. In the rivers of Malabar, as well as in the Ganges and Erawadi, it grows on slimy banks; while in the Moluccas it is found on rocky shores.

In his unnatural genus *Rhizophora*, Linnæus included without distinction both the plants of Rumphius, calling them *R. caseolaris*; but, for what reason I know not, the *Blatti* is not quoted (*Burm. Fl. Ind.* 108.). M. Sonnerat in his *Voyage to New Guinea* gave a figure of this plant, calling it *Pagapate*, evidently the same with the *Bagatbat*, by which name it is mentioned by Camelli. The younger Linnæus then became sensible that this plant could not be continued as a *Rhizophora*, and called it *Sonneratia acida*. M. Lamarck divides this into two varieties; the *rubrum* of Rumphius, which he considers as the *Blatti*, and the *album* of Rumphius, which he makes a second variety: but, as I have said, the difference probably consists merely in the age of the branch; the young ones in flower being quadrangular, while those in fruit are rounded. This also seems to have been the opinion of Willdenow (*Sp. Pl.* ii. 999.), who quotes both the 73rd and 74th table of Rumphius, without establishing two varieties. Gærtner, however (*De Sem.* i. 379. *t.* 78. *f.* 2.), for his *Aubletia caseolaris* cites only the *Mangium caseolare album* (*tab.* 73.); and neither quotes the *Mangium caseolare rubrum* of Rumphius, nor the *Blatti* of Rheede. At the time, however, hé would not seem to have known the change that had been introduced by the younger Linnæus: and subsequent authors have considered (*Willd.* ubi supr. *Enc. Meth. Sup.* i. 641.) Gærtner's *Aubletia* as the *Sonneratia acida*.

In Bengal this plant is called *Ourchaka*, which has no resemblance to *Ambetti*, the name used by the Brahmans of Malabar, probably from the fruit being used as an acid seasoning, like that of the *Mangifera*, which they call *Ambo;* and this in the feminine

feminine would be *Ambetti*. On the Erawadi this tree is called *Lan-bu*.

In the same places with the *Sonneratia acida* I found another tree, which in habit so strongly resembles it, that, notwithstanding considerable differences in fructification, I think it cannot be separated; and Dr. Roxburgh, to whom I showed it on my return from Ava in 1796, was of the same opinion. I call it *Sonneratia apetala;* and Dr. Roxburgh has adopted the same name (*Hort. Beng.* 39.); under which name I sent home specimens and a drawing, now probably in the collection of the late Sir Joseph Banks; and I have since given others to the library at the East India House, where also a copy of the drawing may be seen. This tree the Bengalese call *Kheora*, and the people of Pegu *Kam-ba-la*, neither acknowledging it to belong to the same genus with the *Sonneratia acida*. Although very common among the estuaries of the Ganges, and very beautiful, having a general resemblance to the *Salix babylonica*, it would seem to have escaped the notice of botanists; so that until my return from Ava, Dr. Roxburgh had not observed it, although it grows in the immediate vicinity of the Botanical Garden, in which, however, he had not then taken up his residence.

Sonneratia apetala. *Hort. Beng.* 39.

Habitat in Bengalæ et regni Peguensis ripis cænosis æstu inundatis.

Arbor mediocris. *Radix* cornicula plura emittit simillima corniculorum e *Sonneratia acida* prodeuntium. (Vide *Herb. Amb.* iii. 112.) *Rami* sparsi, penduli, teretes, glabri. *Ramuli* oppositi, divaricati, glabri, filiformes. *Folia* opposita, petiolata, ovato-lanceolata, marginum altero gibbosiore obliqua, integerrima, sæpiùs obtusa, enervia, avenia, plana, carno-

carnosiuscula. *Petiolus* linearis, anceps, brevis, glaber, non stipulaceus.

Flores magnitudine nucis moschatæ pedunculati, cernui, herbacei, glabri: laterales axillares solitarii, terminales subterni. *Pedunculi* folio dimidio breviores, penduli, uniflori, nudi, glabri, apicem versus incrassati, angulati, articulis 1—3 divisi.

Calyx inferus, monophyllus, coriaceus, crassus, campanulatus, ultra medium quadrifidus laciniis ovatis patulis acutis, fundo tectus disco crasso integro staminifero ultra calycis divisionem producto. *Filamenta* plurima, indefinita, linearia, longitudine calycis incurva, ad disci marginem inserta. *Antheræ* parvæ, cordatæ. *Germen* turbinatum. *Stylus* teres, staminibus longior, medium versus angulo duplice flexuosus. *Stigma* maximum, supra convexum, subtus concavum, pileiforme.

Pomum? orbiculatum, depressum, calyce patente ad basin cinctum, stylo persistente mucronatum, septis tenuibus carnosis in loculos circiter octo, putamine lignoso extra cinctos, obsoletè divisum. *Semina* angulata, in pulpo nidulantia.

PANITSJIKA MARAM, *p.* 45. *tab.* 41.

Commeline in his annexed note considers this as the same with the *Janipaba* of Piso, a plant of Brazil, which Linnæus called *Genipa*, but by Willdenow joined to the *Gardenia*. Whether or not this last arrangement be proper I need not here inquire, because the *Janipaba* is no doubt a plant of the order of *Rubiaceæ*, with opposite leaves, while the leaves of the *Panitsjika* are alternate. Plukenet, although not aware of Commeline's error, judged more soundly concerning the affinities of the *Panitsjika;* for in treating of the *Pishamin* of Virginia (*Alm.* 180.), the *Diospyros virginiana* of Linnæus, he says (*Mant.* 99.), "Inqui-

rendum propono, an *Panitsjika-maram*, i. e. Janipaba *Pisonis* ut censet Commelinus, sit de hujus genere (*Diospyros* nempe) plantarum, vel non;" and again, treating of the *Genipat* of the Antilles, misled by the authority of Commeline, he says, "Janipaba Pisonis ab hac diversa est, et fortè idem cum *Panitsjika*, quæ potius de Anonarum seu Mespilorum Sappadilliæ dictorum genere est, ut mecum existimo." Now, although he was probably wrong in considering the *Janipaba* different from the *Genipat*, because the latter is quite different from the *Panitsjika*, yet he pointed out an affinity in the *Panitsjika* to the *Sappaditlia* or *Achras*, which, although one of Jussieu's *Sapotæ*, has certainly a considerable affinity to the *Guajacanæ*, to which the *Panitsjika* belongs.

M. Desrousseaux (*Enc. Meth.* iii. 171.), although he acknowledged the resemblance which this tree bears to a *Diospyros*, considered its character, as given by Rheede, to point out its being a *Garcinia*, and accordingly calls it *Garcinia malabarica*.

Gærtner (*De Sem.* i. 145. *t.* 29. *f.* 2.), although he did not quote the *Panitsjika*, is generally supposed to have described it under the name of *Embryopteris peregrina*, and to have probably been misled by the representation of the fruit at the bottom of the plate in the *Hortus Malabaricus*, which by some mistake is drawn inverted, and by the expression in the description, *Fructus in vertice umbilico præditi.* Owing to these circumstances, he imagined that the fruit was crowned by the calyx, in place of being contained in it; and of course could not consider it as a *Diospyros*. Dr. Roxburgh, unwilling to change the generic name given by so good a botanist, when he published his *Flora Coromandeliana*, although perfectly aware of the situation of the calyx, called the plant *Embryopteris glutinifera*,—a name and genus continued by Willdenow (*Sp. Pl.* iv. 836.), although it is by no means certain that he has not described the same

plant

plant under the name of *Diospyros discolor*. This is the *Cavanillea Mabolo* of Lamarck (*Ill. Gen. t.* 454.), and the *Cavanillea Philippensis* of M. Poiret (*Enc. Meth. Sup.* ii. 135; iii. 566.). The latter seems to be of this opinion: yet, although the leaves vary much in form, I have some doubt whether the *Mabolo* is the same species with the *Panitsjika;* because the former has only four or six seeds, and is hairy; while the latter has eight or ten, and is quite smooth. Concerning the genus there can be no doubt. Brown (*Nov. Holl.* i. 525.) and Dr. Roxburgh finally abandoned *Embryopteris* altogether, and called this plant *Diospyros glutinifera* (*Hort. Beng.* 40.); while Persoon, converting the generic into a specific name, calls it *Dyospyros Embryopteris* (*Enc. Meth. Sup.* iii. 566.), which savours too much of botanical Greek, and might lead one to suppose that it was a Fern.

I have already mentioned that the *Mabolo* can scarcely be of the same species with the *Panitsjika*, on account of its roughness and the number of seeds in its fruit. In the woods south of the Ganges I found a tree, which in the catalogue of specimens presented to the library at the India House (No. 2389) I have called *Diospyros exculpta*, on account of its leaves being as it were carved on the upper side. This, both in number of seeds and pubescence resembles the *Mabolo*, and may be the same, although its leaves are much blunter than represented in M. Lamarck's figure. This, however, is uncertain: and it must be observed that I saw only the male flowers, while the description by M. Desrousseaux (*Enc. Meth.* iii. 664.) refers to the hermaphrodite, which will account for some differences. Dr. Roxburgh, however, received a *Mabolo* from the Philippines, which he considered different from the *Diospyros tomentosa* of Bengal; and this perhaps is the tree I am going to describe, although the

natives

natives whom he consulted gave it quite a different name (*Tumala*) from those I employed.

Diospyros exculpta.
Diospyros discolor. *Willd. Sp. Pl.* iv. 1108?
Diospyros tomentosa. *Hort. Beng.* 40?
Diospyros Mabolo. *Hort. Beng.* 40?
Cavanillea philippensis. *Enc. Meth.* iii. 665?
Cavanillea Mabolo. *Lamarck Ill. Gen. t.* 454?
Kend Hindicè.

Habitat in Indiæ Gangeticæ australioris sylvis.

Arbor parva, cuticula crassissima longitudinaliter rimosa. *Ramuli* tomentosi. *Folia* alterna, ovalia vel elliptica vel subrotunda vel obovata, nunc utrinque acuta, tunc apice obtusa, integerrima, costata, supra nuda et venis depressis quasi insculpta, subtus tomentosa. *Petiolus* brevissimus, teres, pilosus, non stipulaceus.

Flores dioici. In masculina arbore pedunculus longitudine petioli axillaris, vel basin versus ramuli lateralis, tomentosus, subtriflorus; flores parvi, albi.

Calyx tomentosus, ore 4- vel 5-lobo erecto obtuso turbinatus. *Corolla* ore clauso 4- seu 5-lobo monopetala, calyce duplo longior, oblonga, utrinque angustata, pilosa. *Filamenta* 15 circiter setacea, disco calycino inserta. *Antheræ* erectæ, mucronatæ, inclusæ.

Bacca ovalis, calyce crasso sexfido tomentoso brevi insidens, pilis rigidis rufis tecta, seminibus varie abortientibus subquadrilocularis.

The fruit, when ripe, is sweet and not very bad tasted. In the heart of some trees, but not in all, is found a black, hard, heavy substance,

substance, which at Mungher is called *Batti*, and at Saseram *Abnus*. The latter word is, I believe, of Persian origin, and the source from which our Ebony is derived.

One of the most common trees in the dry woods of Mysore differs so little from the preceding, that I have little doubt of its being the same. In 1806 I gave specimens of this to Sir J. E. Smith, under the name of *Diospyros Tupru*; and I shall here describe the flower, which I found on both the male and hermaphrodite trees; and this will show that the difference between the inflorescence of the *Kend*, as described above, and of the *Mabolo*, as described by M. Desrousseaux, is not sufficient to distinguish them as species.

Diospyros Tupru.

Tupru Carnatæ. *Buchanan's Mysore*, i. 183.

Habitat in Carnatæ aridioris sylvis.

Planta omnino ut in *D. exculpto*.

Flores diclines; in una arbore sessiles, hermaphroditi et masculini mixti; in altera pedunculati, omnes masculini. In priore flores sessiles, tomentosi, solitarii, squamis 3 seu 4 bracteati.

Herm.—*Calyx* campanulatus, crassus, sexfidus laciniis ovatis, obtusis, margine revoluto, intus membrana connatis. *Corolla* monopetala ore sexfido. *Filamenta* sex brevissima, hypogyna. *Antheræ* oblongæ, acutæ, simplices. *Germen* superum, ovatum. *Styli* tres brevissimi, crassi. *Stigmata* simplicia. *Bacca* calyce cupuliformi infra arcte cincta, magna, hirsuta, umbilicata, mucronata, quadrilocularis. *Semina* solitaria, amygdaliformia.

Masc.—*Calyx* et *corolla* ut in hermaphrodito. *Filamenta* novem brevissima. *Antheræ* simplices, subulatæ, erectæ, inclusæ, nescio

nescio an non steriles? Rudimentum *pistilli* in fundo calycis hemisphæricum, setis undique obsitum.

In arbore masculina pedunculus axillaris, recurvus, incrassatus, petiolo paulo longior, tomentosus, solitarius, 3- seu 4-florus. *Flores* albidi, cernui, extra tomentosi, squamis geminis ovatis minutis bracteati.

Calyx cyathiformis, laciniis ovatis obtusis planis quinquefidus. *Corolla* campanulata, oblongo-ovata, calyce multo longior, ore patulo, et laciniis obtusis altero marginum exteriore obliquis quinquefida. *Filamenta* disco calycino inserta, circiter octodecem, brevissima, erecta, simplicia. *Antheræ* solitariæ, mucronatæ. *Germen* nullum.

The differences between this description taken in Mysore and that taken at Mungher are too trifling to establish even two varieties of one species. From the structure of the filaments, not only this plant, but the *Mabolo* should, according to the characters laid down by Brown (*Nov. Holl.* i. 525.), be more nearly allied to the *Paralia*, and even to the *Royena*, than to the *Diospyros*. These characters, however, seem rather insufficient to mark well-defined genera.

It must be observed that I have met with another tree of nearly the same name, which has a stronger resemblance to the *Panitsjika* than that above described. From its leaves being carved as it were in a similar manner, I have in the catalogue of specimens presented to the India Company's library (No. 2388) called it *Dyospyros insculpta;* and, although I have not seen the flower, I shall here give a description.

Diospyros insculpta.

Kendu Bengalensium.

Habitat in Camrupæ orientalis montibus.

Arbor mediocris ligno albido. *Ramuli* teretes, glabri. *Folia* alterna,

alterna, oblonga, basin versus latiora, basi acuta, apice acuminata, integerrima, lucida, nuda, subcostata, venis minutè reticulata. *Petiolus* brevissimus, depressus, corticosus, non stipulaceus.

Bacca solitaria, lateralis, pedunculo brevissimo insidens, basi calyce quadrifido tecta, magnitudine nucis Juglandis mucronata, cortice crasso succulento fibroso glutinoso quadrilocularis, loculorum uno sæpè abortiente. *Semina* solitaria, magna, verticalia, oblonga, hinc convexa, inde angulata. *Funis umbilicalis* ex apice fructus per seminis dorsum decurrens, basique superatâ ramosus, ramis per seminis latera interiora reflexis. *Integumentum* crassum, coriaceum. *Albumen* durissimum, album. *Embryo* subcentralis, rectus. *Cotyledones*, altero minore, conduplicatæ. *Radicula* incrassata, supera.

The generic name *Kend* is also given, with a specific appellation prefixed, to another tree, which I think is the *Diospyros cordifolia* of Dr. Roxburgh (*Hort. Beng.* 40.), a name that has been adopted by other botanists (*Willd. Sp. Pl.* iv. 1111. *Enc. Meth.* v. 432. *Hort. Kew.* v. 479.). I have presented specimens of this tree to the library at the India House (*Cat.* No. 2391). In the Hindwi dialect of Behar it is called *Makar Kend;* but according to Dr. Carey, in the Bengalese dialect it is called *Bun Gab*, that is, the wild *Embryopteris;* yet it has no very striking resemblance either to this plant or to the others called *Kend*. This, besides, agrees entirely with Mr. Brown's character of *Diospyros;* and as the differences between it and the species already described may lead to a more proper discrimination of genera than at present exists among the *Ebenaceæ*, I shall here describe it.

Diospyros cordifolia.

Makar Kend Hindicè.

Habitat in sylvis Magadhæ montosis.

Arbor ramulis annotinis rigidissimis, spina valida terminatis. *Ramuli* novelli inermes, pubescentes. *Folia* oblonga, superiora acuta, inferiora obtusa vel etiam emarginata, basi retuso subcordata, nunc ferè ovata, tunc ferè linearia, integerrima, costata, subquinquenervia, venosa, supra nuda, subtus pubescentia. *Petiolus* brevissimus, depressiusculus, pubescens, non stipulaceus.

Masculinæ arboris *pedunculi* axillares, petiolo paulo longiores, 1—4-flori, apice nutantes, tenues, pubescentes. *Flores* ad apicem pedunculi communis subsessiles, parvi, lutei. *Bracteæ* minutæ.

Calyx pubescens, laciniis acutis apice patulis quadrifidus. *Corolla* campanulata, limbo quadripartito revoluto, et laciniis subrotundis obliquis divisa. *Filamenta* octo brevissima, bifida, basi tubi insidentia, sparsa. *Antheræ* sexdecim, acuminatæ, inclusæ. *Pistillum* nullum.

Hermaphroditæ arboris flores non vidi. *Pedunculus* fructiferus axillaris, solitarius, monocarpus, petiolo paulo longior, ebracteatus. *Bacca* magnitudine Pruni mediocris globosa, flava, glabra, calyce quadrifido parvo reflexo cincta. *Cortex* crassa, e pulpo non separabilis, intus mollis, extra duriuscula. *Pulpa* octolocularis, odore Genistæ fœtida, amarissima. *Loculi* monospermi. *Semina* sæpius quatuor, abortivis totidem, arillo carnoso vestita, oblonga, compressa, intus acutangula, apice acutiora, fasciculis striarum quatuor notata, polita, castanea. *Integumentum* durum. *Albumen* forma seminis corneum, sulcis integumentorum insculptum, sub-

subhyalinum. *Embryo* centralis, rectus. *Cotyledones* planæ, ovales, æquales. *Radicula* longa, supera.

The most essential difference between this fruit and that of the *Diospyros insculpta* is, that the cotyledons of the latter are folded, while those of *D. cordata* are plain. Should this difference be found general between the species with distinct filaments and those with filaments united by pairs, especially if the distinction should be accompanied by any remarkable difference in external appearance, such as between the *D. insculpta* and *D. cordata*, there might be room for distinguishing *Diospyros* from *Cavanilla*.

I have presented to the same collection (*Cat.* No. 2387) another kindred species, of which I have seen only the male flowers. These have a structure very similar to that of the *D. Mabolo* or *D. exculpta*.

Diospyros Toposia.

Toposi Bengalensium.

Colitur ad Camrupæ pagos, ob flores fragrantes dilecta.

Arbor magna ramulis teretibus glabriusculis. *Folia* alterna, ovata vel ovato-oblonga, basi acutiuscula, acuminata, integerrima, vix costata, venis minutissimè reticulata, utrinque glaberrima, supra lucida. *Petiolus* brevissimus, supra concavus, non stipulaceus.

In arbore masculina *pedunculi* plerumque ex foliorum axillis in ramulo imorum, vel infrafoliacei, solitarii, 2- seu 3-flori, brevissimi, teretes, vel aliquando terminales, multiflori, subpaniculati, vix bracteati. *Flores* mediocres, lutei.

Calyx parvus, 2—4-fidus, obtusus, petalo arcte adhærens. *Corolla* carnosa, ore quinquefido ovata. *Laciniæ* cordatæ, altero laterum interiore obliquæ. *Antheræ* plures, indefinitæ, e basi corollæ subsessiles tetragonæ, acutæ, latere

utroque longitudinaliter dehiscentes. *Germinis* in corollæ fundo rudimentum depressum.

NÜRVALA, *p.* 49. *tab.* 42.

Commeline in his note mentions the resemblance between this tree and the *Tapia* of Brazil described by Piso; but he only says, "Putamus duas hasce arbores, si non easdem, saltem esse species persimiles." Plukenet (*Alm.* 34; *Phyt. t.* 137. *f.* 7.) described what he called *Apioscorodon*, on account of its having the smell of Garlic, and seems uncertain whether he should refer it to the *Nürvala* of India or *Tapia* of Brazil. He had also procured another plant from America, which he called *Arbor Americana triphylla, numerosis staminulis, purpureis apicibus præditis floris umbilicum occupantibus* (*Alm.* 47; *Phyt. t.* 147. *f.* 6.), which he also refers with doubt to the *Nürvala;* thus probably implying that he considered all the three as belonging to the same genus.

In the *Flora Zeylanica* (211.) Linnæus mentions the *Nürvala* from a drawing taken in Ceylon by Hermann, and considered it as without doubt the same with the first plant of Plukenet, which in the *Hortus Cliffortianus* he had called *Cratæva inermis;* but the *Nürvala* has not the smell of Garlic: *folia manibus confricta suaveolentia—florum odor suavissimus et vinosus—fructus odoris vinosi:* while the leaves of the American plant, as represented by Plukenet, are much broader in proportion to their length than those of the *Nürvala.* But further, Linnæus along with the *Tapia* of Brazil and the *Nürvala* of India, joined the second plant of Plukenet, above mentioned, from Jamaica; for although he does not quote Plukenet twice, he quotes a plant described by Sloane and Ray, which is no doubt the same with that of Plukenet; and this also has the smell of Garlic. The younger Burman (*Fl. Ind.* 109.), although Linnæus in the *Species Plantarum*

tarum called the plant *Crateva Tapia*, denoting thereby that he meant the American plant, continued to quote the *Nürvala* as synonymous. Besides this error, both authors fell into one infinitely worse, by placing the *Tapia* and *Nürvala* in the same genus with the *Covalam* already mentioned; the former belonging to the order of *Capparides*, while the latter is one of the *Aurantiæ*. The circumstance which seems to have misled Linnæus was, that the *Covalam* was called *Belou* by the Brahmans of Malabar, while the *Nürvala* is their *Rana Belou*. When Linnæus published the second edition of the *Species Plantarum*, he separated the plant of Jamaica, calling it *Cratæva gynandra;* and Willdenow (*Sp. Pl.* ii. 853.) separated the *Nürvala* from the *Tapia* of Brazil, and joined it to the *Cratæva religiosa* of Forster and Vahl, of which a figure is given by M. Lamarck (*Ill. Gen. t.* 395.). Although he is followed in this by M. Poiret (*Enc. Meth.* vii. 582.), yet I suppose that this is an erroneous opinion, as the berry of the *Cratæva religiosa* is described and represented as globular, and no larger than a small plum, and the leaves as still smaller and shorter than those figured by Plukenet.

I have already observed what an unnatural genus the *Cratæva*, as left by Linnæus, must be considered; and Dr. Roxburgh wished to abolish it altogether. He therefore not only removed the species (*Marmelos*) belonging to the order of *Aurantiæ*, but the remaining plant, that he knew, he considered as a mere *Capparis*, which he called *trifoliata* (*Hort. Beng.* 41.). Whoever, in fact, endeavours to point out an essential character common to all the species of *Capparis*, will find it a difficult matter to exclude the *Cratæva*. Linnæus seems to have attempted it, by removing the *Cratæva* to the class *Dodecandria* from the class *Polyandria*, where he at first placed it close by the *Capparis;* but this is trifling: one undoubted *Capparis* has only nine stamina, and in several *Cratævas* the stamina are fully as

as numerous as in any *Capparis*. The appearance of the *Cratæva* is however so different from that of the *Capparis*, that they cannot enter one natural genus; and I think the character by which they may be best distinguished is, that the *Capparis* has *petala sessilia*, and the *Cratæva*, *petala unguiculata*. Linnæus could not of course make use of this distinction, because the *petala* of the *Marmelos* are sessile. The flowers of the *Cratæva* also are polygamous, a large proportion being entirely male, with only a rudiment of the pistillum. Whether or not they are all diœcious I cannot say, but some are certainly so.

In the course of travelling, I observed that the specimens of the *Cratæva*, which I examined, differed considerably from each other, so as to lead me to suspect that in India there may be several species: but as I never afterwards was long enough stationary in one place to observe the same tree in all its stages, or to try the effect of different situations on the seed of the same plant, I am by no means certain that my suspicions are well founded. I shall however mention the circumstances by which I was induced to suppose that there are at least four species of *Cratæva* in the Gangetic provinces. This will at any rate throw light on the true generic character. Specimens of the whole have been deposited in the library at the India House.

I shall first describe a species which I met with in Behar, and which, I believe, is Dr. Roxburgh's *Capparis trifoliata*, because he does not quote the *Nürvala* as synonymous, and because he thought it his plant when on my return from Ava I showed him specimens. If it were not for the long point at the end of the leaflets, their breadth would fully equal their length; including these points, the breadth is about half the length.

1. Cratæva odora.
   Capparis trifoliata. *Hort. Beng.* 41?

Varuna Hindicè.
Ka-dhæk Burmanorum.
Habitat in Indiæ locis montosis.

Arbor mediocris ramulis glabris. *Folia* alterna, ternata. *Foliola* petiolata, basi acuta, apice acuminatissima, glabra, costata, venis minutissimè reticulata; lateralia costis interioribus basin versus abbreviatis semiovata; terminale deltoideum. *Petiolus* communis longus, glaber, supra planiusculus, non stipulaceus; partiales brevissimi, marginati.

Corymbi indivisi, nunc laterales nudi, tunc terminales, et sæpè foliis nonnullis inter flores intermixtis comosi. *Pedicelli* sparsi, uniflori, incrassati, glabri. *Flores* magni, speciosi, odoratissimi; immaturi albidi; maturi flavi antheris purpureis.

In arbore hermaphrodita flores masculini pauci hermaphroditis intermixti; meram masculinam non vidi.

In hermaphrodito flore apex pedicelli dilatatus in receptaculum sublentiforme, concavum, e cujus margine prodeunt calycis foliola quatuor, herbacea, elliptica, sessilia, acutiuscula. *Petala* quatuor, calyce alterna, unguibus calyce longioribus insidentia, receptaculo intra calycem inserta, maxima, nervosa, ovata, obtusa, vel subrotunda. *Filamenta* viginti plura subulata, petalis longiora, basi stipitis germen suffulcientis inserta, basi subunita (unde cum Morisoniâ summa affinitas). *Germen* oblongum utrinque acutiusculum, stipiti filamentis longiori insidens. *Stylus* brevissimus. *Stigma* orbiculatum.

Bacca pedicello longissimo insidens, globosa, nuda, magnitudine pomi minoris rubra, cortice crasso molli tecta, pulpo molli repleta. *Receptacula* duo carnosa, longitudinaliter parietibus baccæ adnata. *Semina* pulpo tecta, subspiralia, crustacea.

tacea. *Albumen* nullum. *Embryo* teres, spiralis cotyledonibus hinc planis inde convexis.

In masculinis floribus cæteroquin simillimis stipites germinum brevissimi, cum pistilli rudimento in apicem insidente.

In the Rungpur district I found a small tree, or bush, which agrees so well with the figure given by M. Lamarck of the *Cratæva religiosa*, that, although I have not seen the fruit, I am inclined to think it the same. All the flowers that I saw were male; the tree therefore is no doubt diœcious. Its leaflets are not so much acuminated as in the species last described, and are nearly about half as long again as they are broad.

2. Cratæva religiosa. *Willd. Sp. Pl.* ii. 853; et *Enc. Meth.* vii. 582. (excluso synonymo *Lamarkii Ill. Gen. t.* 395.).

Habitat in locis Camrupæ elevatis.

Corymbus terminalis, erectus, angulatus, indivisus. *Flores* plures, alterni, pedicellis longis nudis, unifloris solitariis insidentes.

Apex *pedicelli* dilatatus in receptaculum sublentiforme, e cujus margine duplice serie prodeunt perianthii foliola octo colorata, unguiculata, persistentia, venosa, hinc majora obovata, inde minora dimidiato-falcata. E medio receptaculi prodit discum truncatum, lateribus staminiferum. *Filamenta* indefinita circiter sexdecim, petalis duplò longiora, foliola perianthii versus minora declinata. *Antheræ* parvæ. *Germen* nullum. *Styli* rudimentum e disci centro subulatum.

Near villages in different parts of the Rungpur district I found what may be another species, and which certainly, on account of the larger size of the fruit, is different from the *Cratæva religiosa* as delineated by M. Lamarck; and on account of the narrowness of the leaflets this has a great affinity to the *Nürvala*.

The

The Bengalese name is a mere corruption of *Varuna*, used in the Sanscrita and Hindwi dialect for the plant last described.

3. Cratæva unilocularis.
   Borun Bengalensium.
Habitat ad Camrupæ pagos.

In masculina arbore petioli apex in discum explanatus. *Calycis* foliola quatuor, lanceolata, sessilia. *Petala* quatuor, deflexa, ovata, unguibus calyce longioribus insidentia. *Flores* ante maturitatem patentes parvi, herbacei : maturi flavi.
In hermaphrodita arbore calyx et corolla masculini. *Stamina* circiter sexdecim. *Germen* stipiti longo tereti insidens, oblongum. *Stigma* sessile, peltatum, truncatum.
Fructus omnino ferè Morisoniæ ut a Gærtnero descriptus. *Semina* pulpo tenacissime adhærente tecta, angulata, planiuscula, crusta tecta crassa fragili. *Albumen* nullum. *Embryo* curvatus, teres. *Cotyledones* amygdalino-carnosæ, subfoliaceæ, varie convolutæ.

All these are small trees growing in elevated situations; but the *Nürvala* grows to a very large size on the banks of rivers, which seems to be implied by *Nür* (*aqua*) prefixed to *Vala*, probably the real generic name in the Malabar dialect.

4. Cratæva Nürvala.
   Cratæva Tapia. *Burm. Fl. Ind.* 109. (exclusis synonymis *Plukenetii*, *Commelini*, et *Sloani*.)
   Cratæva inermis. *Linn. Fl. Zeyl.* 211. (exclusis synonymis *Plumieri*, *Margravii*, *Pisonis*, *Plukenetii*, *Sloani*, et *Raii*.)
   Nürvala. *Hort. Mal.* iii. 49. *t.* 42.
   Varuna Hindicè.
Habitat in ripis fluviorum Indicorum depressis.

This species is distinguished by the narrowness of its leaflets, each being from $2\frac{1}{2}$ to 3 times longer than its breadth, by the long form of its berries, and by its numerous stamina. Rheede further says, "Fructus intus carne humida quadripartita;" which perhaps implies four placentæ, although in my notes I have not remarked this part of the structure.

On the banks of rivers in the Gorakhpur district I found a similar tree in flower; but its leaflets were rather shorter in proportion to their breadth, its flower was not odorous, and its stamina fewer; so that, although the natives said it had an oblong fruit, and although they called it *Varuna*, I have doubts of its being the *Nürvala*. It was however a male tree, with only a few hermaphrodite flowers intermixed, while the *Nürvala* of Rheede is an hermaphrodite; which may occasion a difference. I shall in the mean time, therefore, consider this as merely a variety of the *Cratæva Nürvala*.

Petiolus foliolis brevior, teres. *Foliolum* intermedium lanceolatum.

Receptaculum convexum, margine quadrilobum. *Calycis* foliola apicibus loborum insidentia, lanceolata. *Petala* e receptaculi incisuris acuta. *Filamenta* 12—15 disci superficiei superiori undique inserta. *Germen* sulcis quatuor exaratum. *Stigma*: concavitas in apice styli insculpta, hocque non latior.

TAMARA TONGA, *p.* 51. *tab.* 43, 44.

In a Commentary on the *Herbarium Amboinense* (i. 115.) I have said all that seems necessary concerning this tree.

BILIMBI, *p.* 55. *tab.* 45, 46.

In the same Commentary I have noticed nearly all that is necessary to be said concerning this plant. In India Proper it

is

is an exotic, and not common any where that I have seen. From the name given to it by the Brahmans of Malabar it would appear to have come from Malacca.

NELI POULI seu BILIMBI ALTERA MINOR, *p.* 57. *tab.* 47, 48.

The Malabar generic name is *Pouli;* and *Neli*, prefixed as a specific appellation, implies a resemblance to the *Neli* or *Phyllanthus Emblica* of Linnæus, a more just and striking comparison than European naturalists for a long time pointed out; for they copied the error of Rheede in considering it as of the same genus with the *Bilimbi*. *Pouli*, as a generic name, seems also to be used in the *Carca-puli*, which is mentioned in the first part of the *Hortus Malabaricus*, *p.* 42, as belonging to what is now called an *Oxycarpus*. The chief resemblance here is, that the fruits of the two trees are nearly of the same size, colour, and taste. Rheede's classing it with the *Bilimbi* is very little if at all better. The name *Anwallis*, which he says is used by the Brahmans of Malabar, is probably derived from the Arabic *Ambela* (for the tree is no doubt an exotic in India Proper), and was probably introduced from the Eastern islands by the Arabs of Malabar, who traded to that quarter long before the arrival of Europeans.

Plukenet (*Alm.* 45.) thought that the *Neli Pouli* might be his *Arbor Malabarica Fraxini ferè folio, ossiculo fructus octangulari* (*Phyt. t.* 269. *f.* 2.), which would appear to be a *Bradleja*, and therefore to be at least of the same natural order; but it certainly is a different plant: and he is the less excusable in this error, because he had described the real *Neli Pouli* under the name of *Cheramei Acostæ folio Pyri* (*Mant.* 45.), a name that had been given to it by John Bauhin.

Rumphius (*Herb. Amb.* vii. 33. *t.* 17.) gives an excellent account of the tree under the name *Cheramela*, but does not class

it with any other. The elder Burman by a very rude classification calls the *Neli Pouli*, *Malus indica fructu parvo, rotundo, acido, striato;* and notices that the Ceylonese call it *Nelli*, the same name that is given to the *Phyllanthus Emblica*, a resemblance to which has been already mentioned.

Linnæus, in the *Flora Zeylanica*, 179, returned to the error of Rheede and Ray in classing it with the *Bilimbi*, and called it *Averrhoa ramis nudis fructificantibus, pomis subrotundis:* and when he gave specific names, the *Neli Pouli* was called *Averrhoa acida* (*Burm. Fl. Ind.* 106.), although it is less acid than either of the other plants with which it was then classed. In the *Mantissa*, 124, Linnæus described a plant called *Cicca disticha*, which, he says, has a capsular fruit; and which therefore may be the plant that Plukenet compared to the *Neli Pouli*,—that is, a *Bradleja;* but his son, notwithstanding this great difference, alleged (*Suppl.* 416.) that the *Cicca disticha* and *Averrhoa acida* are the same: and such is now the general opinion among botanists (*Willd. Sp. Pl.* iv. 332. *Hort. Kew.* v. 258. *Lamarck Ill. Gen. t.* 757. *f.* 1.), although M. Lamarck (*Enc. Meth.* ii. 1.) points out the difficulty which I have mentioned. Whether or not deterred by this, or whether attracted by the resemblance to the *Phyllanthus Emblica*, Dr. Roxburgh (*Hort. Beng.* 69.) quotes the *Neli Pouli* for his *Phyllanthus longifolius:* but I here suspect some mistake; for he says that its Bengalese name is *Lodh*, which is a plant used in dyeing, and never, so far as I know, applied to the *Cheramela:* besides, he has also a *Phyllanthus Cheramela* (*Hort. Beng.* 104.), to which, I suspect, the quotation from the *Hortus Malabaricus* should have belonged.

In the Rungpur district I have found a plant with leaves very like the *Neli Pouli*, which I suspect belongs to the real genus *Cicca*, as described by the elder Linnæus, and to which the *Cicca congesta* of Lamarck probably should be referred, but

which

which cannot with propriety be classed with the *Cheramela* or *Cicca disticha* of the younger Linnæus and subsequent authors. In many respects it agrees with the genus *Agyneia* of Linnæus; on which account, in the catalogue of dried plants presented to the library of the India House (No. 2072) I have proposed it as an *Agyneia* with a mark of doubt.

Agyneia? tetrandra.

Phyllanthus tetrandrus. *Hort. Beng.* 69?

Habitat inter saxa in Camrupæ orientalis locis montosis.

Frutex duos pedes altus ramis bifariis. *Ramuli* pinnæformes, compressiusculi, pubescentes. *Folia* subsessilia, quasi pinnata bifaria, ovata, uno laterum sæpe paulo latiore obliqua, utrinque pilosa, subtus albida, acuta, integerrima, venosa. *Stipulæ* parvæ.

Flores masculini ex axillis foliorum inferiorum congesti, plurimi, rubicundi. *Pedicelli* filiformes.

Calyx pubescens, patens, laciniis laceris ultra medium quadrifidus. *Filamentum* turbinatum, centrale, apice tetragonum. *Antheræ* quatuor subrotundæ, angulis filamenti adnatæ.

Flores fœminei ex axillis foliorum superiorum solitarii, vel terminales racemosi. *Pedicelli* brevissimi, setacei, incrassati.

Calyx quinquepartitus laciniis oblongis, acutis, coloratis, laceris. *Germen* echinatum. *Styli* tres bipartiti. *Stigmata* simplicia.

Capsula pisiformis, hirsuta, calyce erecto tecta, trilocularis, loculis dispermibus.

Panja seu Panjala, *p.* 59. *t.* 49—51.

In a Commentary on the *Herbarium Amboinense* (i. 195.) I have mentioned most of what I had to say concerning this plant, with my reasons for adopting the name affixed to it in the collection presented

presented to the India House (*Cat.* No. 1526). I shall here annex the synonyma which seem to me really to belong to it.

Gossampinus alba.

Bombax pentandrum. *Hort. Kew.* iv. 196. *Hort. Beng.* 50. *Willd. Sp. Pl.* iii. 731. *Enc. Meth.* ii. 551. *Burm. Fl. Ind.* 145. (exclusis synonymis fortè ad plantam Americanam pertinentibus, ut et *Plukenetii*.)

Ceiba pentandra. *Gærtn. de Sem.* ii. 244. *t.* 133. *f.* 1?

Xylon foliis digitatis caule inermi. *Linn. Fl. Zeyl.* 220.

Eriophorus Javana. *Herb. Amb.* i. 194. *t.* 80.

Panja seu Panjala. *Hort. Mal.* iii. 59. *t.* 49—51.

Arbor Gossampinus. *Plinii Hist. Nat. l.* xii. *c.* 10, 11.

Swet (alba) Shimul Bengalensium.

Habitat in Indiæ sylvis rariùs.

Gærtner neither mentions from whence he had the fruit, nor the manner in which it opens, which renders it doubtful whether he describes this or the American plant.

MOUL ELAVOU, *p.* 61. *tab.* 52.

This is one of the most common trees in India, and is remarkable in spring, when it has no leaves, for an immense quantity of bright red flowers. On this account it is most probably the *Arbor lanigera*, seu *Gossampinus Plinii* of Bontius. The cathartic powers which Rheede attributes to its roots and flowers are extraordinary in this tribe of plants, chiefly remarkable for a mild mucilage; and would seem, if well founded, to imply a necessity of separating it from the proper *Malvaceæ*.

On account of the prickles on the stem, the fallacious nature of which character I have noticed in commenting on the *Herbarium Amboinense*, Plukenet considered it as perhaps the same with his *Gossipium* seu *Xylon arbor occidentale digitatis foliis per marginem*

marginem crenatis, fructu conoide quinquecapsulari, lanugine leucophæâ referto (*Alm.* 172. *Phyt. t.* 189. *f.* 1.); but this is evidently an error, the leaflets of the American plant being toothed on the edges, while in the Indian plant they are quite entire. Rumphius and his commentator Burman, as I have said, seem strangely to have considered the *Pania* and *Moul Elavou* as the same plant, but evidently described only the former. Linnæus (*Fl. Zeyl.* 221.) united a plant of America with the *Moul Elavou;* but he does not quote Plukenet; and therefore his plant, which was then common in the gardens of Europe, might have the edges of the leaflets entire. This plant of Linnæus in the first edition of the *Species Plantarum* became *Bombax Ceiba* (*Burm. Fl. Ind.* 145.). In the second edition, however, the *Moul Elavou* having been found different from the American *Ceiba* described by Bauhin and Sloane, it was called *Bombax heptaphyllum*, and new synonyma were given. Among these was still an American plant described by Jacquin; and the *Gossypium* s. *Xylon arbor orientale digitatis foliis lævibus, fructu quinquecapsulari, alba et nitente lanugine farcto* (*Pluk. Alm.* 172. *t.* 188. *f.* 4.), which, although said to be an Asiatic plant, cannot well, on account of its stamina, be considered as representing the *Moul Elavou*. I suspect, however, that Plukenet was mistaken concerning the country from which he obtained his plant, for I have seen none such in India; and his figure is quoted by all for the tree of the West Indies. Besides, as Cavanilles observes (*Enc. Meth.* ii. 553.), Linnæus describes the plant as having a monopetalous corolla, while that of the *Moul Elavou* has five petals; and it is therefore probable that the plants are different. Willdenow, although he quotes the *Hortus Malabaricus*, probably meant some other plant, as he calls it an American: and in the figure of Plukenet, which he also quotes, there is no appearance of prickles in even the branch. Further, as in the *Hortus Kewensis*

ensis (iv. 196.) this figure of Plukenet is the only authority quoted, we may fairly infer that the proper *Bombax heptaphyllum* of European botanists is an American plant, and not the *Moul Elavou*, although it was probably the flowers of the latter which M. Cavanilles saw, and although it no doubt is the *Bombax heptaphyllum* of Dr. Roxburgh. It is certainly also one of the plants which must be referred to the *Gossampinus* of Pliny. I shall therefore call it

Gossampinus rubra.

Bombax heptaphyllum. *Hort. Beng.* 50.
Bombax Ceiba. *Burm. Fl. Ind.* 145. (exclusis synonymis ad plantam Americanam spectantibus.)
Xylon foliis digitatis, caule aculeato. *Linn. Fl. Zeyl.* 221. (exclusis synonymis omnibus nisi *Rheedii* et *Raii*.)
Moul Elavou. *Hort. Mal.* iii. 61. *t.* 52.
Arbor Lanigera sive Gossampinus Plinii. *Bontius, l.* 6. *c.* 14. *Hort. Mal.* iii. 60.
Rukta (rubra) Shimul Bengalensium.
Habitat in India ubique vulgatissimè.

BELUTTA TSJAMPAKAM, *p.* 63. *tab.* 53.

The comparison of this by the Dutch inhabitants of Malabar and naturalists to the Chestnut is an attempt at classification no better than that of the Hindus, who class it with the *Michelia Vatica*, *Ochna*, &c. &c.; for the word here written *Tsjampakam* seems to be the same with what is also called *Champaka*, *Champaca*, *Champacam*, *Changpa*, and even *Champa*, although this last is applied to several of the *Monocotyledones*: so that the plants to which it is given seem to have no other general character than that of producing showy and odorous flowers. The name *Naga Tampo*, said to be given to this tree by the Brahmans of Malabar,

Malabar, I suspect should have been written *Naga Champo*, the latter word being the same with the *Tsjampakam* of the vulgar dialect, while the specific term *Naga* implies that the tree is connected with the divine serpent, although it must be confessed, as we shall see, that another derivation is given.

Plukenet (*Alm.* 90.), adhering to the opinion of Commeline, called this tree *Castanea rosea Indica*. Linnæus (*Fl. Zeyl.* 203.) quoted it for the second variety of his *Mesua foliis lanceolatis*, his first variety being the *Arbor Naghas sive ferrea* of Burman (*Thes. Zeyl.* 25.). This author says, that in the Ceylonese dialect *Naghas* or *Naghaha* implies *Arbor ferrea*. *Ghas* or *Ghaha* no doubt signifies a tree or plant; but *Na* is quite different from any Indian name of iron that I know of; and I suspect that the name should have been written *Nag' Ghas* or *Nag' Ghaha*, the serpent's tree. I observe nothing in the account of Burman that should lead to a suspicion of his plant being in any respect different from that of Rheede. Willdenow has however joined it with the *Nagassarium* of Rumphius (*Herb. Amb.* vii. 3. *t.* 2.), which, if not a different species, is at least a very remarkable variety; as it is a small tree (*truncus non ultra sex pedes extensus*), with leaves less than those of the Willow, and like those of the Olive; nor has its fruit the four remarkable ribs so conspicuous on that of the *Belutta Tsjampakam*. So great indeed is the difference between the two plants, that the younger Burman considered them as belonging to two distinct genera (*Fl. Ind.* 121.), the plant of Rumphius being his *Calophyllum Nagassarium*, and that of Rheede his *Mesua ferrea*, as it is that of Linnæus. This supposition of the two plants belonging to different genera I have no doubt is an error; and the plant of Rumphius, which is pretty common in the North-east of Bengal and in Ava, is no doubt a *Mesua*, but I am inclined to think of a different species from the tree described by Rheede, which however I have not

seen. M. Poiret (*Enc. Meth.* iv. 416; *Sup.* iv. 56) it must be allowed makes no distinction. The plant of Dr. Roxburgh (*Hort. Beng.* 41.) is that of Rumphius. Whether or not he ever saw that of Rheede I know not, but he does not quote the *Hortus Malabaricus*.

KAPPA MAVA, *p.* 65. *tab.* 54.

In my Commentary on the great work of Rumphius (*Herb. Amb.* i. 177.) I have said all that seems necessary on this subject.

ITTI ARE ALOU, *p.* 69. *t.* 55.

Commeline justly considered this as a *Ficus*. The Malabar name implies that the tree is an *Are Alou* (*Ficus religiosa*, Lin. Trans. xiii. 487.), having a resemblance to the *Itti* or *Itty Alou* (Ibid. 486.), which is perhaps the *Ficus Benjamina* of M. Lamarck (*Enc. Meth.* ii. 493.). The generic name *Goli*, given to this tree as well as to the *Itti Alou* by the Brahmans of Malabar, is probably the same with the *Gular* of the Hindwi dialect, given to several *Fici*. The word *Douadeke* prefixed seems to imply that its branches abound with milky juice.

Rumphius at first (*Herb. Amb.* iii. 140.) confounded the *Itty Alou* with his *Varinga parvifolia*; but, as I have mentioned in treating of that plant, this was an error; the *Itty Alou* bearing its figs on stalks, while those of the *Varinga parvifolia* are sessile; and, in fact, Rumphius was afterwards (*Append.* iii. 142.) sensible that he should have quoted the *Itti Are Alou*. On this account I should have considered Burman correct in quoting the *Itti Are Alou* (by the Latin name of Commeline) for the *Varinga parvifolia* (*Herb. Amb.* iii. 142. *in tabulæ explanatione*), were it not that Rumphius says, "fructus formam Grossulorum referentes, inferius nempe angustati, superius rotundi," which in the Linnæan language would be *fructus obovati*; while Rheede describes

describes the fruit of his plant as *plano-rotundi*, which in Linnæan language is *depresso-globosi;* and both Willdenow and the authors of the *Encyclopédie* agree in considering the plants different.

M. Lamarck (*Enc. Meth.* ii. 495.) suspected, although with some doubt, that the *Itti Are Alou* might be his *Ficus punctata;* but Thunberg, properly rejecting this, calls it his *Ficus nitida*, in which he is followed by M. Poiret (*Enc. Meth. Sup.* ii. 653.) and Willdenow (*Sp. Pl.* iv. 1145.). I think that I have seen the tree on rocky hills both in the South of India and in the province of Behar. Specimens of the former, with a drawing, I gave to Sir J. E. Smith under the name of *Ficus Condaravia*, from *Konda* (*montana*) and *Ravi*, a generic name in the Telinga language; and I have given to the library at the India House specimens from Behar, where it is called *Khota Pipar*. I shall here annex a description taken in the latter country.

Arbor mediocris, lacte valdè scatens, ramulis obtusangulis glabris. *Folia* alterna, subovata, basin versus aliquando subcuneata, apicem versus sæpius acumine brevissimo obtuso angustata, integerrima, glabra, supra nitida, venis remotiusculis etiam ultra submarginalem reticulata, nervis apice incurvis prope marginem cingentibus subcostata. *Petiolus* depressiusculus, supra canaliculatus, glaber, brevissimus. *Stipulæ* spathaceæ, caducæ.

Fici geminæ, axillares, sessiles, pisiformes, nudæ, involucro brevi trilobo crasso insidentes.

In India gangetica radicantem non vidi; sed in India australi, ubi lætius crescebat, ramos habebat radicantes.

TSJEROU MEER ALLOU seu ALOU, *p.* 71. *tab.* 56.

Rheede describes two species called *Meer Alou;* this, and the *Atte Meer Alou* mentioned in page 75: and the two plants are very nearly allied, both belonging to the natural division of the genus *Ficus*, which has pedunculated fruit; a circumstance generally connected with scabrous or very rigid leaves, having their sides either unequal or lobed or indented, while the species with sessile fruit have soft, entire, and equal-sided leaves. The resemblance between the two *Meer Alous* is striking not only to the vulgar of Malabar, but to the Brahmans, who give them both the generic appellation of *Parai*. The *Tsjerou Meer Alou* is the prototype of the genus *Parai*, having no specific name prefixed. It is quoted with doubt in Willdenow (*Sp. Pl.* iv. 1145.) for the *Ficus terebrata;* but as this has sessile fruit, we may safely reject the quotation, this circumstance, as I have said, being of the most essential importance in distinguishing the species of this genus. I at one time thought that it might be the plant of Rumphius figured in the 85th plate of the third volume, which in the explanation of the plate is called *Varinga rubra;* and this led me to suppose that it was the *Supa* or *Varinga rubens:* but I observe that this is an error, and that Rumphius describes no plant called *Varinga rubra*, while the 86th plate represents the *Supa*, a large tree. But plate 85 therefore represents no doubt the *Varinga repens*, a climber, which consequently cannot be the *Tsjerou Meer Alou*. I think it probable that the same erroneous explanation of the 85th plate led M. Lamarck (*Enc. Meth.* ii. 497.) to quote it, although with doubt, for his *Ficus pyrifolia* (not that of Burman, *Fl. Ind.* 226.), which therefore may be very nearly allied to the *Tsjerou Meer Alou*, although M. Poiret quotes this, in imitation of Willdenow, for *Ficus terebrata* (*Enc. Meth. Sup.* ii. 645.). I shall

shall now describe a plant which may perhaps be the *Tsjerou Meer Alou*, and of which I have given specimens to the library at the India House (*Cat.* 2416).

Ficus undulata.

Tsjerou Meer Alou. *Hort. Mal.* iii. 71. *t.* 56?

Rakhalpani Bengalensium.

Habitat in Camrupæ orientalis locis montosis.

Arbor magna, lactescens, ramulis nudis fuscis. *Folia* alterna, oblonga, basi acutiuscula, apice acuminata, integerrima, rigida, glabra, undulata, subtrinervia, subcostata, venis minutè reticulata. *Petiolus* semiteres, brevissimus, fuscus. *Stipulæ* caducæ.

Racemus axillaris, rigidus, simplex longitudine petioli apice gemmiferus, fructu foliis e gemma prodeuntibus laterali. *Pedicelli* gemini, uniflori, ancipites, glabri, receptaculo florum longiores. *Bracteæ* ad basin pedicellorum minutæ, triphyllæ. *Flos* obovatus, glaber magnitudine Pisi majoris.

I did not see this tree sending roots from its branches; but even the *Per Alou* does not do this when planted in confined situations and excluded from a free circulation of air. It remains, however, yet to be determined whether the *Tsjerou Meer Alou* is my *Ficus undulata* or the *Ficus pyrifolia* of M. Lamarck, if it be either.

Katou Alou, *p.* 73. *t.* 57.

Commeline supposed this to be the *Ficus Indica* of Clusius, and the *Ficus Indica foliis Mali Cotonei similibus, fructu ficubus simili* of Caspar Bauhin, that is, the *Ficus Indica* of the Greeks and Romans; and he supposed that it might be the same with an American plant described by Rochefort. In my Commentary on the *Peralu* (*Linn. Trans.* xiii. 488.) I have mentioned that these

these suppositions are liable to great objections, as was indeed noticed by Plukenet (*Alm.* 144.), although in writing that Commentary I did not attend sufficiently to what he said, and confounded together two of his plants, which, being placed next each other, I took for one,—an error which I beg leave now to correct. Plukenet mentions an affinity between the *Katou Alou* and his *Ficus arbor Americana, Arbuti foliis non serrata, fructu Pisi magnitudine, funiculis e ramis ad terram demissis prolifera* (*Phyt. t.* 178. *f.* 4.), now called *Ficus pedunculata* (*Willd. Sp. Pl.* iv. 1138.); but he says expressly, that Commeline erred in considering the *Katou Alou* as the *Ficus Indica;* and that the *Katou Alou* could not be the American plant which he described, because its fruit is much larger and its leaves hairy beneath; while the fruit of the American species being like Pease, and its leaves being smooth, it has a greater affinity to the *Tsjakela* of Rheede. In fact, this American tree is the *Ficus laurifolia* of M. Lamarck (*Enc. Meth.* ii. 495.), and perhaps the *Ficus venosa* of Willdenow (*Sp. Pl.* iv. 1136.); while the *Tsjakela* is the *Ficus venosa* of the *Hortus Kewensis* (first edition, iii. 451.), now called *Ficus infectoria.* The *Peralu*, indeed, which I agree with Dr. Roxburgh in thinking to be the true *Ficus Indica*, Plukenet referred, but with doubt, to another American plant, his *Ficus Americana, latiori folio venoso ex Curaçoa* (*Alm.* 144; *Phyt. t.* 178. *f.* 1.), which was then cultivated in the Royal Garden at Hampton-Court; and this in all probability is the tree which Linnæus, omitting the cautious doubt of Plukenet, called the *Ficus Benghalensis*, the barbarous name of which I complained. The figure of Plukenet (*Phyt. t.* 178. *f.* 1.) has no doubt a considerable resemblance to the *Peralu;* but the difference of the countries where they grow is so great, that much reliance cannot be placed on figures that represent neither flower nor fruit. The figure, besides, of Plukenet resembles fully as much the *Katou Alou* as the *Peralu;*

but

but as it has smooth leaves, it can be neither one nor the other. The proper synonyma of the *Peralu*, which Commeline referred to the *Katou Alou*, Plukenet (*Alm.* 144.) refers to his *Ficus Indica Tiliæ folio, subtus albo et villoso, polyrhizos, seu filamentis e summis ramis ad terram missis radicosa*, which he procured from the sea-shore of Barbadoes, and of which a figure is given (*t.* 178. *f.* 3.); and with this also he confounds the *Pipal* of the Bengalese, although in *f.* 2. he gives a representation of this plant which cannot be mistaken. The plant of Barbadoes by M. Lamarck (*Enc. Meth.* iii. 352.) is referred to the *Hibiscus tiliaceus*, not without strong grounds; yet it is difficult to suppose such an error in Plukenet, especially as he no doubt represents the *Hibiscus tiliaceus* in another place (*Amalth.* vi. *t.* 355. *f.* 5.). I am therefore inclined to follow Willdenow in thinking the plant of Barbadoes to be at least a *Ficus* (*Sp. Pl.* iv. 1133.), although I doubt much of its being the *Sycomorus* of Egypt, as he supposes. The figure no doubt resembles a good deal that of the *Sycomorus Mathioli* in John Bauhin (*Hist. Plant.* i. 124. *f.* 1.);—but who ever heard of the Sycamore growing in Barbadoes as a Mangrove? This opinion originated probably with Burman (*Fl. Ind.* 225.); and I doubt as much of the fact of the *Sycamorus* being found in the East, as in the West, Indies. The plant that Burman mistook for it is probably what I take to be the *Ficus Caricoides* of Dr. Roxburgh (*Hort. Beng.* 65.), of which I have deposited specimens in the library at the India House.

Having thus endeavoured to correct the error into which I fell when treating of the *Peralu* and *Ficus Indica*, and to show that neither it nor the *Katou Alou* was known to Plukenet, I return to Burman, who, following the first edition of the *Species Plantarum*, gives us (*Fl. Ind.* 225.) the *Katou Alou* as the true *Ficus Indica* of the ancients, but without quoting any American plant as synonymous. He however adds as a variety the *Tsjela*, to

which we shall soon have occasion to return. When, however, Linnæus published the second edition of his *Species Plantarum*, he added many other synonyma, and among these an American plant described by Catesby; from which alone, as M. Lamarck justly observes (*Enc. Meth.* ii. 495.), he seems to have drawn his specific character, this probably having been the only one of the plants quoted that he had actually seen.

M. Lamarck, therefore, returns to the first supposition of Linnæus, and gives the *Katou Alou* as the true *Ficus Indica*, referring to it all the synonyma of old botanists, who meant to describe the tree of Pliny and Theophrastus;—but what probability is there that a tree growing neglected in the obscure parts of the South, should be that noticed by the Greeks and Romans in the North of India, while in every part the *Peralu* is cultivated with a religious veneration? The very Malabar names show the difference: *Alu* or *Alou* being the generic name, *Per* signifies Tree, as if we should say *Arbor Alou dicta* by way of excellence; while *Katou* implies this species of *Alou* to be the *sylvestris*, to use the language of the older botanists. In the same manner the *Peralu* by the Brahmans of Malabar is called *Vadhou* (from *Vata* of the Sanscrit) by way of excellence; while the *Katou Alou* is distinguished by a specific term (*Doulo*) prefixed, to mark its not being the true prototype of the genus. I approve therefore entirely of the change made by Willdenow, who, although he knew nothing of the *Katou Alou* except from the *Hortus Malabaricus*, calls it *Ficus citrifolia* (*Sp. Pl.* iv. 1137.).

Dr. Roxburgh, so far as we can judge from the *Hortus Bengalensis*, would not seem to have seen any tree which he referred to the *Ficus citrifolia* or *Katou Alou*: but in the South of India I found a tree which I should have had no doubt was the same, had I ever seen roots descending from its branches; but this I never did, and the natives assured me that it does not possess this

this quality. I am inclined, however, to doubt the accuracy of their information; and the tree in other respects so nearly resembles the *Peralu* as to justify its being considered as the wild plant of the same species. In 1806 I gave specimens and a drawing to Sir J. E. Smith under the name of *Ficus Gonia*, and shall here give a description.

Ficus citrifolia. *Willd. Sp. Pl.* iv. 1137?
Ficus indica. *Enc. Meth.* ii. 495? (exclusis synonymorum pluribus.)
Arbor Supa dicta. *Herb. Amb.* iii. 135. *t.* 86?
Katou Alou. *Hort. Mal.* iii. 73. *t.* 57?
Goni Carnatæ Tamulorum et Telingorum.
Habitat ad pagos et vias Carnatæ rarius.

Arbor facie omnino *Fici Indicæ* (*Peralu*), sed radicantem nunquam vidi. *Ramuli* juniores tomentosi. *Folia* alterna sinu minuto subcordata, ovata, acumine brevi terminata, supra pilis fuscis, subtus villo denso vestita, costata, venis reticulata. *Petiolus* brevis, depressus. *Glandula* in dorso nervi medii paulo supra folii basin plana, glabra. *Stipulæ* gemmaceæ, hirsutæ.
Fructus geminus, sessilis, bractea triphylla cinctus, lævis, magnitudine Nucis moschatæ oblongus, aurantiacus, luteo punctatus.

The plant of Rumphius, mentioned with doubt among the synonyma, is very like indeed to what I consider as the *Ficus citrifolia;* and the strong resemblance which this has both to the *Supa* and *Peralu*, both certainly emitting roots from their branches, induces me to doubt the information on this point which I received from the natives. I have however seen a tree which I consider as not improbably the *Supa;* and, as it has

smooth leaves, I think it probably different from what I have above described; but this is not certain, as Rumphius does not say whether the leaves of the *Supa* are smooth or hairy. The proper place, however, for discussing this is in the Commentary on the *Herbarium Amboinense*.

Nearly allied to these plants I have met with two others still more hairy than the *Katou Alou;* and I shall here take an opportunity of describing them, as they do not seem to be mentioned by either Rheede or Rumphius.

Of the first I have given specimens to the library at the India House under the name of *Ficus asinina*, as it is called *Gadha Bar* in the Hindwi dialect, *Gadha* signifying an Ass, and *Bar* being a vulgar corruption of *Vata*, the Sanscrita name of the *Ficus Indica* (*Peralu*). It grows on the hills of Behar, and has a very strong affinity to the *Katou Alou* in every thing but the fruit.

Arbor magna, e ramis radicantem non vidi. *Ramuli* teretes, annulati, maturi glabri, juniores tomentosi, lactescentes. *Folia* alterna, oblonga, apices prope latiora, basi cordata, acumine brevi obtusa, costata, venis minutè reticulata, rigida, margine reflexo integerrima, supra nuda, subtus tomentosa. *Petiolus* brevissimus, teretiusculus, tomentosus, non lactescens. *Glandula* in nervi medii dorso prope folii basin plana, glabra. *Stipulæ* caducæ.

Receptacula florifera pisiformia, gemina, axillaria, sessilia, ore clauso glabro tomentosa. *Bractea* cyathiformis, receptaculo brevior, 5—7-fida, irregularis.

Fici maturæ virides, molles, magnitudine Grossulariæ minoris globosæ, tomento albo denso indutæ, involucro multo majores.

The other plant I found growing from the crevices of rocks in the Mysore country, where it is called *Kalu Atti* or *Kalu Basseri*,

seri, *Kalu* or *Kul* implying *rock*. On this account I called it *Ficus rupestris*, and under this name gave a drawing and specimens to Sir J. E. Smith.

Arbor ramis radicantibus tomentosis parva. *Folia* basi cordata, sed apicem versus sæpè dilatata, in humidis locis subangulata, in siccis integerrima, utrinque pilosissima, sed mollia, acumine minimo subobtusa. *Petiolus* teres, tomentosus. *Fructus* pisiformes, gemini, sessiles, axillares, tomentosi, foliolis tribus bracteati.

One or other of these plants, but which I cannot say, is probably the *Ficus tomentosa* of Willdenow (*Sp. Pl.* iv. 1136.), which, he says, he had from Dr. Roxburgh, who mentions it in the *Hortus Bengalensis*, 103, without reference to any figure. I should certainly have considered my *Ficus rupestris* as the *F. mollis* of Vahl, had he not described the fruit as solitary; yet Willdenow quotes Vahl's plant as being the same with his, which he describes to have the fruit growing in pairs. Perhaps he had learned that Vahl was mistaken; for M. Poiret (*Enc. Meth. Sup.* ii. 653.) follows Willdenow without remark. As Willdenow's plant has the upper side of the leaves smooth, it is perhaps my *Ficus asinina?*

Atti Meer Alou, *p.* 75. *t.* 58.

I have already mentioned the affinity of this tree with the *Tsjerou Meer Alou* (*t.* 56.), from which it differs in having the leaves more unequal sided and more scabrous, and the figs larger. It has a still stronger affinity with the *Teregam* (*t.* 60.), which with leaves shaped like the *Tsjerou Meer Alou*, and a fruit like the *Atti Meer Alou*, is a great deal rougher than either. The two plants are however so much alike, that the description by M. Lamarck (*Enc. Meth.* ii. 496.) of the *Ficus Ampelos*, for

which the *Teregam* is quoted, applies very well in every thing but the fruit to the plant which I take to be the *Atti Meer Alou;* but this again is quoted by M. Poiret (*Enc. Meth. Sup.* ii. 654.) and by Dr. Roxburgh (*Hort. Beng.* 66.) for the *Ficus excelsa.* No species under this name is mentioned in Willdenow; yet it is possible, as the specific character agrees entirely with the plant, that this is what he calls *Ficus septica* (*Sp. Pl.* iv. 1142.). As for this he quotes neither the authorities adopted by Burman (*Fl. Ind.* 226.), his plant is probably different from Burman's. Specimens of the plant that I have seen are deposited in the library at the India House (*Cat.* No. 2413).

HANDIR seu HANDUR ALOU, *p.* 77. *t.* 59.

This plant Burman (*Fl. Ind.* 226.) joined with the *Ficus septica* of Rumphius (*Herb. Amb.* iii. 153. *t.* 96.), which name he adopted; and the same is done by M. Lamarck (*Enc. Meth.* ii. 496.), both no doubt following the authority of the elder Burmān in the explanation of the plates in the *Herbarium Amboinense.* This authority is none of the best; and the form both of the leaves and fruit in the figures given by the two authors is so different, that I suspect they meant different plants. Willdenow was probably of the same opinion, as he quotes neither for his *Ficus septica,* which he took from Forster, and which, as I have said, is perhaps the *Atti Meer Alou.* I have not seen any plant which I could refer to the *Handir Alou;* but it seems to have a very considerable affinity to the *Ficus oppositifolia* of Dr. Roxburgh, and some of its leaves are represented in the figure as having nearly a similar position.

TEREGAM, *p.* 79. *t.* 60.

In treating of the *Atti Meer Alou* I have already mentioned somewhat concerning this plant, which Rumphius properly judged

judged to be his *Folium politorium* (*Herb. Amb.* iv. 128. *t.* 63.). These Burman also considered (*Fl. Ind.* 226.) as the same species, which from the Javanese name he called *Ficus Ampelos*. M. Lamarck, treating of the *F. Ampelos* (*Enc. Meth.* ii. 496.), quotes Rumphius with doubt; on what grounds he does not say, but his plant has the mouth of the *receptaculum* so open as to render it an intermediate link between *Ficus* and *Ambora*; from which we may safely conclude that it is neither the *Folium politorium* nor *Teregam*. On this account probably Willdenow has altogether omitted the *Ficus Ampelos*; and on the authority of Loureiro has referred the *Folium politorium* to a species which he calls *Ficus politoria* (*Sp. Pl.* iv. 1144.), a name which he should not have used, because M. Lamarck had previously given it to a very different species (*Enc. Meth.* ii. 500.). Besides, as Loureiro describes the fruit to be disposed in spikes, he probably meant a plant different from that of Rumphius and Rheede, although it may have leaves fitted to polish wood;—for such a quality is found in several species of this genus, and is therefore no proof of identity. In this opinion I am confirmed by Dr. Roxburgh, who neglects Loureiro's quotation, and calls the *Folium politorium*, *Ficus exasperata* (*Hort. Beng.* 66.), thinking it different from the *Ficus Ampelos* of Kœnig (*Hort. Beng.* 103.). Whatever may be the case with these modern innovations, I have little or no doubt of the *Teregam* and *Folium politorium* being the same plant, and of their being the *Ficus Ampelos* of Burman.

The name *Cara-vatti*, applied to this tree by the Brahmans of Malabar, contains both a specific and generic appellation. *Cara*, the specific name, signifies "wild;" and *Vatti* is a corruption of *Vata*, the Sanscrita name of the *Ficus indica*, a word perhaps derived from the same root with the *Vates* of the Latin, as under the shade of this tree the Gymnosophists of old delivered their

their laws. This generic term is therefore applied to some species that do not send roots from their branches; but perhaps such are never called *Vata* or *Vatti* or *Batti* without the term *Cara* prefixed.

PERIM TEREGAM, *p.* 81. *t.* 61.

This is another tree, which the Brahmans called *Carabatti*, using the compound word for the generic term, and prefixing the specific name *Meri*, which would seem to countenance the idea above mentioned. No notice was taken of the *Perim Teregam* by any subsequent author, except the compiler Ray, until M. Lamarck quoted it, with doubt however, for his *Ficus symphytifolia* (*Enc. Meth.* ii. 498.). On the contrary, Willdenow (*Sp. Pl.* iv. 1151.) quotes it, but with doubt also, for the *Ficus oppositifolia*, to which indeed it has a considerable affinity; but there is nothing in either the figure or description to induce us to think that its leaves are opposite. In this point, however, Rheede and his painters were often negligent; and I must confess that I at one time thought with Willdenow, that the *Perim Teregam* was a variety of the *Ficus oppositifolia*, of which I gave specimens (*Cat.* No. 2424) to the library at the India House: but on more mature deliberation, I think, that these specimens can scarcely be the *Perim Teregam*, which has the edges of its leaves quite entire, while in my plant they are indented. On the whole I doubt much of the *Perim Teregam* having been noticed by modern botanists.

VALLI TEREGAM, *p.* 83. *t.* 62.

Here is a third species, which the Brahmans of Malabar call *Caravatti;* but it is distinguished by having annexed the specific name *Valli* (*scandens*), which, contrary to the usual custom, is placed after instead of before the generic name.

Plukenet very strangely imagined that this was the same with his

his *Uvifera arbor Americana convolvulacea, fructu aromatico punctato* (*Alm.* 394; *Phyt. t.* 237. *f.* 4.), which would seem to be a *Michelia* or *Magnolia*.

The younger Burman (*Fl. Ind.* 227.) established a new species of *Ficus*, which he called *Grossularioides*. This consisted of two varieties; and the first was a plant described by Garcin, which having poisonous fruit, as well as many external differences, would appear to be a distinct species from the second variety, which is the *Valli Teregam*. The younger Linnæus (*Sup.* 442.) would seem to have seen this latter plant, and called it *Ficus heterophylla*. M. Lamarck (*Enc. Meth.* ii. 499.) procured from M. Sonnerat specimens of a plant, which notwithstanding some differences, he considered as the *F. heterophylla;* and, although he quotes the *Hortus Malabaricus* with doubt, he uses the description contained in this work to make up a full account, joining what he saw in his specimens to what he found in Rheede, a practice that cannot fail to lead into mistakes. There is indeed great reason to think, on account of the hairiness, that his specimens were like those which Dr. Roxburgh sent to Willdenow, and which he published under the name of *Ficus repens* (*Sp. Pl.* iv. 1149.). Of this, M. Poiret (*Enc. Meth. Sup.* ii. 648.) has become sensible, and he considers the *Ficus heterophylla* of M. Lamarck as the *Ficus rufescens* of Vahl. On my return to Calcutta from Ava (1796) specimens and a drawing of this, under the name of *Ficus repens*, were sent to the late Sir Joseph Banks, and a copy of this drawing is to be found in the library at the India House. I have since also lodged in the same collection specimens from India Proper, under the name of *Ficus rufescens*. These differ a little from the plant found in Ava; but not so much as to warrant their being considered as forming a distinct species, as will appear from the following account.

Ficus

Ficus repens *α*.

Kha aun Burmanorum.

Habitat in ripis Avæ fertilibus.

Caulis fruticulosus, tres pedes longus, ramosus, glaber, repens. *Folia* alterna, cordata, obtusa, supra nitida, punctata, rugosa, pilis brevissimis scabra, costata, venis reticulata, margine repando sed integerrimo quasi denticulata, nunc integra, tunc triloba, vel sæpius repanda, sinubus lobisque obtusis. *Petiolus* teres, annulo ramum cingens, mediocris, hispidus. *Stipulæ* geminæ, laterales, brevissimæ, caducæ. Inter pilos densos brevissimos, qui in petiolum et foliorum nervos insidunt, pauci sunt longiores apice hamati.

Receptacula axillaria, lactescentia, erecta, solitaria, pedunculata, ovata, obtusa, angulata, pubescentia, elevato-punctata, apice sexdentato umbilicata. *Pedunculus* erectus, longitudine fere petiolorum compressus, apicem versus squamula una vel altera obtusa bracteatus.

Ficus repens *β*.

Habitat in Camrupæ sylvis.

Caulis hirtus. *Folia* reverè dentata, supra scabra, et pilis stellatis hispida, subtus hirta, cæteroquin vix diversa.

The leaves of this plant are used in Ava for polishing timber, as is also the case with those of the *Ficus denticulata* of Willdenow (*Sp. Pl.* iv. 1132.), which, although placed by him at a great distance from the *Ficus repens*, is not a very distinct species, differing chiefly in its stem being scandent instead of repent; but this may be owing to its being found in places that are at times inundated, which may occasion the plants growing there to raise themselves, while those in dry places creep on the surface. The leaves of the creeping kind are just as often lobed, as

those

those of the kind which grows erect. Specimens of this last were sent from Ava to the late Sir Joseph Banks, under the name of *Ficus scandens;* and others from India have been placed in the library at the India House, under the name of *Ficus denticulata* (*Cat.* No. 2438), a name not known when I first saw the plant, and which seems to have escaped Dr. Roxburgh, as he called the same plant *Ficus quercifolia;* at least the plant which was shown to me in the Botanical Garden by that name was the *Ficus denticulata.* I am however aware that much reliance cannot be placed on the accuracy of gardeners. The plants of this species also from the two countries differ in a few points, but such as do not warrant a separation.

Ficus denticulata *α.*

Re-sa-dut Burmanorum.

Habitat in Irabatis ripis inundatis.

Caulis fruticosus, scandens, teres, ad petiolos annulo dimidiato cinctus, glaber, ramosus. *Ramuli* scabri. *Folia* alterna, petiolata, oblonga, nunc sæpius integra, tunc triloba, vel sinuata, basi integra, serrata, acuta, subtrinervia, venis reticulata, utrinque scabra. *Petiolus* brevis, compressus, canaliculatus. *Stipulæ* geminæ, laterales, caducæ.

Receptacula axillaria, sæpius solitaria, aliquando gemina, viridia, magnitudine Amygdali oblonga, umbilico subrotundo subsexdentato obsolete hexagona, scabriuscula. *Bractea* brevis, integra. *Pedunculus* longitudine fere receptaculi teres, pilis setaceis apice glandulosis pubescens.

Ficus denticulata *β.*

Bola Dumor Bengalensium.

Habitat in Brahmaputris ripis inundatis.

Folia ad nervum medium utrinque in pagina inferiore, ubi nervi

laterales inseruntur, glandulam habent parvam planam, quam in Ava non innotui. *Fructus* maturus magnitudine Grossulariæ ovatus, flavus, ore sæpius quinquedentato.

This last plant, on account of the erectness of the stem, comes nearest the *Valli Teregam*, from which it differs chiefly in being rougher and in having smaller fruit; but I must confess that these appear to me slight circumstances for establishing distinct species.

Willdenow, wishing perhaps to avoid the ambiguity of two plants having been named *Ficus heterophylla*, abandoned this name altogether; and for the plant so named by the younger Linnæus, that is, the *Valli Teregam*, adopts Kœnig's specific name *aquatica* (*Sp. Pl.* iv. 1133.), which leads me rather to suspect that his specimens belonged to the plant which I have called *Ficus denticulata;* for this grows in places which are occasionally inundated: but Rheede says that the *Valli Teregam* grows in woods. It must be also observed, that Willdenow did not see the figs of his plant, on the form of which the difference between the *Ficus denticulata* and the *Valli Teregam* chiefly depends. M. Poiret however (*Enc. Meth. Sup.* ii. 648.), and Dr. Roxburgh (*Hort. Beng.* 65.) retain the name *heterophylla* for the *Valli Teregam*, the *Ficus heterophylla* of M. Lamarck being by M. Poiret called *Ficus rufescens*.

On the whole, the *Ficus denticulata*, *F. repens*, and *F. aquatica* are distinguished by circumstances of no great consequence; and perhaps the *F. truncata* of Willdenow (*Sp. Pl.* iv. 1132.) is not very materially different; and all are nearly connected with the *F. Grossularioides* of Burman, now almost forgotten (*Enc. Meth. Sup.* ii. 657.), although it was the species first introduced into the modern system of botany.

TSJELA,

Tsjela, *p.* 85. *t.* 63.

The natives of Malabar seem to consider this *Ficus* as the prototype of a genus, giving it no specific name. What *Tsjela* means, I do not know; but *Asouatou* (the name used by the Brahmans) is the same with *Aswattha*, a name given by the Bengalese to the *Ficus religiosa*. Both indeed are very nearly allied; for they have sessile figs growing in pairs, and neither sends roots from the branches. Further, both are usually parasitical plants, and at first take root either on other trees or on walls, which they soon destroy, leaving a congeries of roots above-ground in place of a stem. Both however, if planted in the ground, thrive well, and produce stately and ornamental stems. There are, however, several other *Fici* which grow in a similar parasitical manner; and among these, some of the kinds called *Varinga* by Rumphius, and *Alou* by Rheede, although these send roots from their branches.

Plukenet after Ray calls this plant *Ficus Malabarica, fructu Ribesii forma et magnitudine, Tsiela dicta* (*Alm.* 145.), and compares it to the *Arbor Sycophora Caryophylli aromatici foliis et facie Jamaicensis* (*Alm.* 42.), of which a figure is given in the *Phytographia* (*t.* 266. *f.* 1.). Plukenet, however, merely compares the plants, and by no means says that they are the same. He adds in a concluding sentence, that from its branches it sends down fibres, which take root: but it is not perfectly clear whether he means this to apply to the *Tsiela* or to the plant of Jamaica. If he meant the former, he was misinformed, as Rheede does not say a word of such a circumstance; and all persons whom I consulted agreed in denying its taking place. Plukenet himself seems to have been sensible of some error here; for in the *Mantissa*, 75, he considers the *Tsjela* as probably being the *Ficus Indica Mali Limoniæ folio, subtus canescente*,

cente, *fructu exiguo cortici adnato*, *Sunutperai Malabarorum*, which he places immediately after the *Ficus religiosa*, a species that does not send these fibres from its branches. It seems, however, to be on the first supposition of Plukenet alone that Linnæus and the younger Burman (*Fl. Ind.* 226.) joined the *Tsjela* to the *Ficus indica*, placing it in the same variety with the *Varinga latifolia* of Rumphius (*Herb. Amb.* iii. 127. *t.* 84.), which cannot possibly be admitted (see my Commentary, *Linn. Trans.* xiii. 487.). It seems indeed difficult to suppose how Burman could imagine the *Tsjela*, with leaves nearly lanceolate, to belong to the same species with the *Katou Alou*, which has ovate or cordate leaves. I indeed think it probable that this quotation arose from an error in the person who engraved the 64th plate in this volume of the *Hortus Malabaricus*, and who instead of *Tsjakela* has placed over it *Tsjela;* so that Burman seeing this, considered it as the plate representing the *Tsjela*.

I have already mentioned, when treating of the *Katou Alou*, that M. Lamarck selected it for his *Ficus Indica;* but rejected the *Tsjela*, as not sending roots from its branches; and neither he nor M. Poiret attempted to introduce it into the system. Willdenow, on the contrary, rejecting the *Katou Alou*, adopts the *Tsjela* for his *Ficus Indica*, leaving out from his specific character the essential words *ramis radicantibus*, used by Linnæus. Willdenow had seen specimens of his *Ficus Indica;* but whether they belonged to the *Tsjela* or to the *Varinga latifolia* it is impossible to say, as he quotes both. Dr. Roxburgh, who most properly restored the name *Ficus Indica* to the *Peralu*, or Banyan-tree, and who was perfectly acquainted with the *Tsjela*, calls it *Ficus Tsjela* (*Hort. Beng.* 66.).

Besides the *Tsjela*, I have found in Gangetic India three other species so very nearly allied, that the names *Nakur*, *Pakur*, and *Naksa* are applied to them in a different manner by different persons.

persons. I shall here, therefore, give an account of them all; especially as the *Tsjela* is the only one of which a figure has been published.

1. Ficus Tsjela. *Hort. Beng.* 66.
   Ficus Indica. *Hort. Kew.* v. 483. *Willd. Sp. Pl.* iv. 1146. (exclusis synonymis nisi *Rheedii* omnibus.)
   Ficus indica Mali Limoniæ folio subtus canescente, fructu exiguo cortici adnato. *Pluk. Mant.* 75.
   Tsjela. *Hort. Mal.* iii. 85. *t.* 63. perperam a Bermanno (*Fl. Ind.* 226.) cum *Varinga latifolia* ramis radicantibus conjuncta.
   Naxa Bengalensium.
   Pakur Hindicè.
   Habitat ad Indiæ pagos.

Caudex omnino ut in *F. religiosa*. *Folia* ad basin sæpe acutiuscula, semper cuneato-angustata, nunquam exquisitè ovata, parum undulata, nervis vix exactè oppositis subtrinervosa, costata, venosissima, utrinque glabra, multo quam in *F. religiosa* minora. *Petiolus* ad apicem posteriùs vix glandulosus, canaliculatus, tenuis, latitudinem folii longitudine superans.

Fici geminæ, axillares, pisiformes, glabræ, sessiles, bractea brevi triphylla cinctæ; maturæ folio caduco nudatæ.

Flores foliis pullulantibus se manifestant, annoque integro consumpto maturescunt.

2. Ficus scandens mihi, sed non *Lamarckii*, quæ Ficus stipulata *Willdenovii*.
   Lot (scandens) Pakur Bengalensium.
   Habitat ad Matsiæ pagos.

Arbor magna. *Rami* horizontales, quibus sæpe insidentia semina

mina ibi pullulant, radices longas ad terram demittentia; sed radices nulli e ramis ipsis prodeunt. *Folia* glabra, acuminata, trinervia, integerrima, nunc sæpius ovalia, tunc subcordata, vel etiam basi aliquando cuneata. *Petiolus* brevis, canaliculatus.

Fructificationem non vidi.

3. Ficus Lacor.

Ficus Ind. Orient. Obe vulgo junioris folio, flore albo tubuloso, sericea lanugine obsito, fructu orbiculari, Pancer Maram Malabarorum. *Pluk. Mant.* 75.

Lakor seu Nakor Hindicè et Bengalensium.

Habitat ad Indiæ Gangeticæ pagos rarius.

Caudex omnino ut in *F. religiosa*. *Folia* oblonga, cordata, glabra, acuminata, integerrima, subtrinervia, costata, venosissima, plana. *Petioli* ad apicem vix glandulosi, canaliculati, latitudine foliorum breviores.

Fici geminæ, sessiles, pisiformes, pilis albis rectis densis tomentosæ. *Bracteæ* triphyllæ, obtusæ, ficis multo breviores.

TSJAKELA, *p.* 87. *t.* 64, where it is erroneously called TSJELA.

The error above mentioned has been already noticed in treating of the *Tsjela*; as has also the error into which I fell in stating Plukenet to have considered the *Tsjakela* as the same with what he figured in the *Phytographia*, *t.* 178. *f.* 1. On the contrary, he considered it as the same with his *Ficus arbor Americana, Arbuti foliis non serrata, fructu Pisi magnitudine, funiculis e ramis ad terram demissis prolifera* (*Alm.* 144; *Phyt. t.* 178. *f.* 4.). This opinion, however, is not tenable, as the *Tsjakela* has no roots of the kind, and is a link connecting the *Tsjela* and its kindred species with the *Arbor Conciliorum* of Rumphius, and with the *Ficus religiosa*. The Brahmans of Malabar indeed class it with the

the *Peralu*, giving it the generic name *Vodou*, no doubt derived from the Sanscrita *Vata ;* but in this they have been guided by the form of the leaves.

The younger Burman (*Fl. Ind.* 227.) took up this plant by the name *Tsjakela*, joining to it the *Ficus Surattensis et Malabarica, Mori folio* of Garcin: but after this the plant seems to have been unnoticed until Mr. Aiton published the first edition of the *Hortus Kewensis*, when he called it *Ficus venosa*. Willdenow afterwards, in the *Berlin Transactions*, published an account of a tree which he took to be that of the *Hortus Kewensis ;* but when he published the *Species Plantarum* (iv. 1136.), he discovered that he had been mistaken. In place, however, of leaving the name *venosa* with the plant, which had been originally so called by Aiton, he transferred it to his new plant, and the *Tsjakela* he called *Ficus infectoria*, a word probably of his own coining, but meant perhaps to imply its being a dye. This name, however, has been adopted in the second edition of the *Hortus Kewensis* (v. 485.), and by Dr. Roxburgh (*Hort. Beng.* 66.); but rejected by M. Poiret (*Enc. Meth. Sup.* ii. 657.), who calls the *Ficus venosa* of Willdenow the *F. leucantatoma*,—rather a hard name. Specimens of the *Tsjakela*, under the name given by Willdenow, have been presented to the library at the India House; but I must observe that the specific character of the *Ficus infectoria*, given by Willdenow and copied by Aiton, is not applicable to the plant which I mean; and that I judge it only to be the same, from the *Tsjakela* being quoted as synonymous. I shall therefore describe it.

Ficus venosa. *Enc. Meth. Sup.* ii. 657.

Ficus infectoria. *Hort. Beng.* 66. *Hort. Kew.* v. 485. *Willd. Sp. Pl.* iv. 1137, quod ad synonymon, sed non quod ad characterem.

Ficus

Ficus Tsjakela. *Burm. Fl. Ind.* 227.
Tsjakela. *Hort. Mal.* iii. 87. *t.* 64.
Karu Basseri Carnatæ.
Achin Bengalensium.
Habitat ad Indiæ pagos.

Arbor vasta, lacte plurimo scatens, sæpe parasitica. *Ramuli* teretes, annulati, glabri, non radicantes. *Folia* alterna, approximata, oblongo-ovata, basi obtusissimâ vel retusâ subcordata, acuminata, integerrima, glabra, trinervia, costata, venosissima, decidua. *Petiolus* glaber, brevissimus, depressiusculus, canaliculatus, ad apicem subtus glandula plana sæpe instructus. *Stipulæ* geminæ, gemmaceæ, annulo ramum cingenti insidentes, folio novello longiores, oblongæ, obtusæ, integerrimæ, rubræ, deciduæ.

Fici geminæ, sessiles, axillares (sed post foliorum casum sæpius maturescunt), pisiformes, exalbido-rubellæ, umbilico clauso sæpius acuminatæ, punctatæ, involucro emarcido 3—5-phyllo cinctæ.

V. *Obser-*

V. *Observations on the Crepitaculum and the Foramina in the anterior Tibiæ of some Orthopterous Insects.* *By the Rev. Lansdown Guilding, B.A. F.L.S.*

Read June 7, 1825.

Of the organs possessed by the insect tribes, none merit diligent examination more than those which are connected with the production of sound. The structure of most of them is well known at the present day, and has been elucidated by accurate figures. Some, however, require further explanation. I shall briefly notice one insect, and describe its crepitaculum, and the tibial foramina of two orthopterous genera*.

The subdiaphanous horny apparatus at the base of the wings of the male *Locustæ* and *Achetæ* has long since been observed to be the *instrumentum stridoris* by which the mute female is invited by the male to celebrate their nuptials; but the peculiar and admirable structure of the part has not been shown in a satisfactory manner by the engraver. In different species it varies greatly, but in the one I shall notice it is exceedingly complete. On the horny base of the left hemelytron, beneath, a strong ridge projects, which is furnished with hard and regular teeth: on the right one, a bony process is placed, so as to act on the serrated

* Drawings of the several parts, by the author, are deposited in the collection of the Society.

projection of the hemelytron which lies above it; and it is by rubbing the one over the other that the loud or shrill sound of most orthopterous insects is produced.

One species, *Locusta camellifolia*, whose call (resembling the words *shock—shock* slowly and loudly repeated) may be heard in the stillness of the night at the *distance of a mile*, has often astonished the inhabitant of Europe on his arrival in the tropical regions. It is hardly possible to contemplate a more extraordinary scene than one of our valleys by the light of the moon, decorated with the shining foliage of waving palms, and lighted up by thousands of luminous Coleoptera, which flit in every direction before our eyes; while the grasshoppers, in company with the *Hylæ* and *Tettigoniæ*, perform their deafening concert. In this most interesting species the wing-cases are admirably adapted to increase the sound, being deeply concave in the male, even the wings are closely pressed by the arched pterigostia against the walls of the hemelytra, leaving a considerable space vacant above the abdomen.

The other organ to which I wish to call the attention of entomologists, (and which was first noticed, I believe, by De Geer,) is situated on the anterior tibiæ of both sexes in such of the orthopterous insects as possess the crepitaculum or tympanum at the base of the wing-cases. In the Fabrician *Locustæ* it consists of two approximate suboval open foramina, gibbous at the sides: in his *Achetæ*, of two opposite oval flattened openings, closed by a delicate membrane. In the true *Grylli*, whose organ of sound (noticed by Kirby in his *Introduction to Entomology*, vol. ii.) is very different in its structure and position, these openings are wanting.

I have no means in this distant country of examining the genus *Pneumora* of Thunberg, the species of which are remarkable for the

the sounds they produce; but they probably present a similar conformation of the anterior tibiæ*.

It may not, perhaps, be improper in this place to mention a curious apparatus (*penicillus*) in the anterior tibiæ of nocturnal Lepidoptera, especially of the *Sphingidæ*, though given for a very different purpose. It varies much in shape and size, but is generally an elongate velvet pad, and is used to brush and clean the large eyes of the animals of this order.

St. Vincent, Jan. 5, 1824.

* On examining several species of *Pneumora* in the Society's collection, the foramina alluded to by Mr. Guilding cannot be detected. In this genus the organ of sound is not situated at the base of the elytra, but on the sides of the abdomen, as pointed out in the 3rd edition of the *Introduction to Entomology*.—[Note by the Secretary.]

VI. *Description of the* Plectrophanes Lapponica; *a Species lately discovered in the British Islands. By Prideaux John Selby, Esq. F.L.S. Communicated by the Zoological Club of the Linnean Society.*

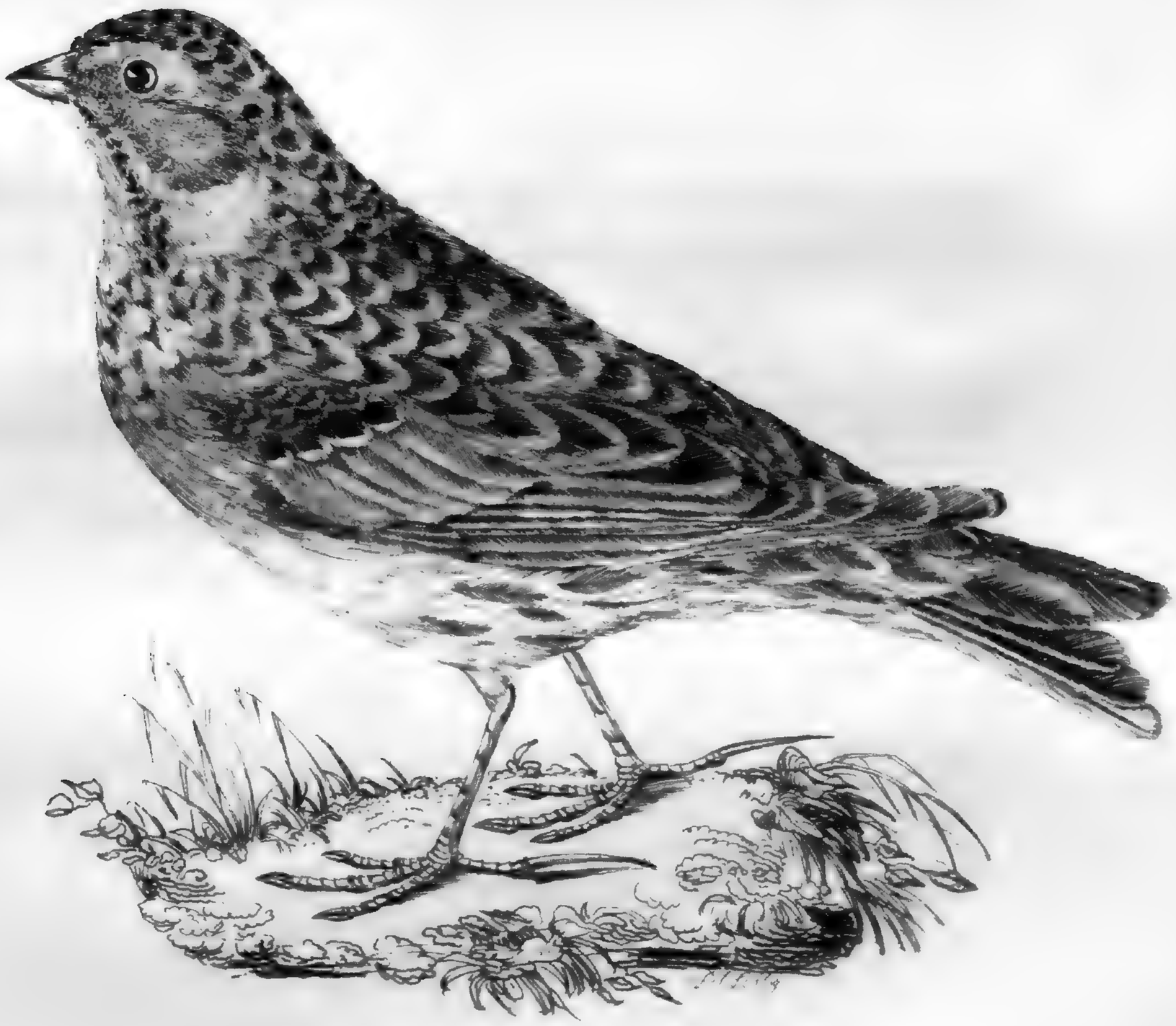
Read February 7, 1826.

The following description and figure (Tab. I.) of the Lapland Bunting (the *Fringilla lapponica* of Linnæus, the *Emberiza calcarata* of Temminck), is taken from a specimen in the valuable cabinet of my friend N. A. Vigors, Esq. This individual, which from its plumage appears to be a young bird, was found in Leadenhall-market among some Larks, which had been sent up to London from Cambridgeshire, and was preserved by a respectable naturalist*, from whose collection it afterwards passed into that of Mr. Vigors. As a species hitherto unnoticed in Britain, I have great pleasure in adding it to the list of our Fauna, which within the last few years has become enriched by several new and rare species.

* Mr. George Weighton, of the City-Road; whose services to science as a collector have already been recorded in these *Transactions*. See vol. xiv. p. 561.

A second individual of this species, taken alive in the neighbourhood of Brighton, and kept caged for some months, as a variety of Lark, is now in the possession of Mr. Yarrell of Ryder-street. It differs from the specimen described in being generally of a darker colour, the spots upon the breast and neck are also more distinct, but the disposition of the markings the same. This difference probably arises from age or sex, or it may be the result of confinement. To the last-mentioned cause may also be attributed the slight elongation and rough exterior of the bill.

Ordo.



Plectrophanes Lapponica

Ordo. INSESSORES. *Vigors in Linn. Trans.*

Trib. CONIROSTRES. *Cuv.*

Fam. FRINGILLIDÆ. *Vig.*

Genus. PLECTROPHANES. *Meyer.*

Rostrum breve, conicum; *culmine* rotundato, apice subcoarctatâ, basi inter plumas frontis extendente; *naribus* ovalibus, plumosis, partim membranâ tectis. *Mandibularum* marginibus introrsùm inclinantibus, a se deorsum paululum dissidentibus, superiore angustiore intùs medio subgibbo.

Alæ acuminatæ, ad medium caudæ extendentes, *remigum* primâ et secundâ ferè æqualibus longissimis; secundæ et tertiæ pogoniis externis subemarginatis.

Cauda mediocris, subforficata.

Pedes subgraciles; ungue postico producto plus minusve recto.

Lapponica. P. capite nigro, superciliis albis, corpore testaceo nigroque vario, collo suprà ferrugineo, duabus rectricibus externis maculâ albâ cuneiformi notatis, ungue postico subrecto digitoque longiore.

Fringilla lapponica. *Linn. Syst.* i. *p.* 317. 1. *Lath. Ind. Orn. v.* i. *p.* 440. *Gmel.* i. *p.* 900.

Fringilla montana. *Briss. tom.* iii. *p.* 160.

——— calcarata. *Pall. It. p.* 710. 20.

Le Grand Montain. *Buff. Ois. v.* iv. *p.* 134.

Lapland Finch. *Arct. Zool.* ii. *no.* 259. *Lath. Syn.* iii. *p.* 263.

Emberiza calcarata. *Temm. Man. d'Ornith. v.* i. *p.* 324.

JUVEN.

JUVEN. *Rostrum* fusco-brunneum ad basin luteum. Totum *corpus* suprà luteo-cinereum fusco maculatum. *Supercilia* lutea, *genæ* luteæ fusco mixtæ; *gula* lateraque *colli* sordide alba fuscis duabus striis. *Jugulum pectus*que sordide alba fusco-maculata. *Abdomen* albidum, lateribus fusco-striatis. *Tectrices* alarum *remiges*que secundariæ fuscæ, marginibus ferrugineis. *Remiges rectrices*que albido marginatæ, his duabus extimis maculâ albidâ cuneiformi notatis. *Pedes* brunneo-fusci; *ungue hallucis* ferè recto, digito longiore.
In Mus. Dom. Vigors.

DESCR. *Bill* yellowish-brown, palest towards the base of the under *mandible*. *Head* and all the upper parts of the *body* pale wood-brown tinged with yellowish-gray, the shafts of the feathers blackish-brown. Greater *wing-coverts* and secondary *quills* blackish-brown deeply margined with chestnut- or orange-brown, the tips white. *Quills* dusky-brown, paler at the edge. Above the eyes a broad streak of pale wood-brown. *Cheeks* and *ear-coverts* wood-brown, the latter mixed with black. From the corners of the under *mandible* on each side of the throat a streak of blackish-brown. *Throat* yellowish-white. Lower part of *neck* and *breast* dirty-white with numerous dusky spots. *Belly* and *vent* white. *Flanks* with oblong dusky streaks. *Tail* dusky, the outer feather with the exterior web, and half of the interior, dirty-white; the second with a small wedge-shaped white spot near the tip. *Legs* and *toes* brown; *claws* not much hooked, the posterior nearly straight, and longer than the *toe*.

By Dr. Latham and several other writers, this bird is placed in the genus *Fringilla* of Linnæus, probably on account of the form of its bill, which is comparatively shorter and thicker than that

that of the more typical species of *Emberiza*. It possesses, however, the palatial protuberance or knob, a characteristic feature of the latter group; and its bill is in all respects similar in conformation to that of the Snow Bunting (*Emberiza nivalis* Auct.), which by Dr. Latham is placed at the head of his genus *Emberiza*. By M. Temminck it is arranged with the Buntings, forming with *Emberiza nivalis* his second section of that genus, under the denomination of "*Bruants éperonniers.*"

The comprehensive and enlightened views adopted by our most eminent naturalists of the present day, in the classification and arrangement of zoological objects, and which, in the department of ornithological science, have been so ably developed by Mr. Vigors, have induced me to separate this species and *Fringilla nivalis* from the true Buntings, and to assign them a station in accordance with their natural affinities. In doing this, I follow the example of two eminent continental ornithologists, MM. Meyer and Vieillot, both of whom have already separated these two species from *Emberiza*, the one under the generic title of *Plectrophanes*, the other under that of *Passerina*. The appropriate station then, of this genus, I conceive to be intermediate between *Alauda* and *Emberiza*, and forming as it were the medium of connexion or passage from one genus to the other. In *Alauda* it is met by that section of the genus which, in the increasing thickness and form of the bill, shows a deviation from the more typical species, and a nearer approach to the thick-billed *Fringillidæ;* to this section *Alauda calandra*, and *brachydactyla* belong. Its affinity to the Larks is also shown in the form of the feet and production of the hinder claw: this in *P. Lapponica* is nearly straight, and longer than the toe, resembling in every respect that of many of the true Larks. The habits and manners of the two known species also bear a much greater resemblance to those of the Larks than the Buntings.

tings. Like the members of the first genus, they live entirely upon the ground, and never perch: their mode of progression is also the same, being by successive steps, and not the hopping motion used by all the true *Emberizæ*. A power of flight superior to that possessed by the true Buntings is also indicated by the greater length of the wings and form of the quill-feathers. In *Plectrophanes*, the first and second quills are nearly equal in length, and the longest in the wing: in *Emberiza*, on the contrary, the second and third are equal, and longer than the first. The affinity of our genus to *Emberiza* is shown in the form of the bill, which, with the exception of being shorter and more rounded on the back, possesses the characteristic distinctions of that genus.

VII. *De-*

VII. *Description of a new Genus of the Class Mammalia, from the Himalaya Chain of Hills between Nepaul and the Snowy Mountains. By Major-General Hardwicke, F.R.S., and F.L.S.*

Read November 6, 1821.

CHAR. GEN. *Dentes primores* utrinque sex, in eadem serie collocati, superiorum laterales majores, basi grādu interiore obliquo aucti, inferiorum laterales incrassati, apice latiores, externe oblique truncati, intermedii duo paululum breviores. *Laniarii* primoribus multo longiores, superiores conici recti, inferiores subarcuati, oblique patentes, utrinque pagina exteriore sulcis duobus longitudinalibus exarati. *Molares* utrinque quinque, serie rectâ collocati, gradatim ampliores ad quartum usque: suprà *primus* intervallo brevi ab laniariis remotus, majusculus, acie conoïdeâ procerâ posticè gradu abbreviato prædità, latere interiore ad basin marginatus; *secundus* subincrassatus, cuspidibus tribus lateralibus, mediâ elatiore, duabus intermediis brevioribus, unâ interiore simplici minimâ, omnibus acutis, conicis aut compressis; *tertius* multicuspidatus, cuspidibus exterioribus suberectis, serie eâdem dispositis, intermediâ majore elatiore, interioribus duabus anticis conicis, basi tumidis, posticâ minore, cuspidibus lateralibus adpressâ, omnibus subobliquè truncatis, apicibus marginatis, circularibus aut undulatis concavis, tuberculo interiore minimo abbreviato margini basilari apposito; *quartus* maximus multicuspidatus, cuspidibus duabus exterioribus, anticâ tripartitâ elatiore,

tiore, intermediis duabus maximis, his omnibus truncatis, margine subprominente circulari aut undulato cinctis, tuberculis tribus interioribus abbreviatis, simplicibus, acutis, in marginem interiorem coadunatis; *quintus* paululum angustatus multicuspidatus, quarto structurâ ac divisione similis. *Dentes maxillæ inferioris* angustiores: *primus* sectorius compressus, acie procerâ gradu postico basilare præditâ; *secundus* ampliatus, cuspide intermediâ latere exteriore truncatâ, gradibus accessoriis duobus, antico brevi compresso, postico latiore truncato tritorio; *tertius* multicuspidatus, cuspide anteriore obliquè truncatâ, intermediâ maximâ, sulco profundo sejunctâ, basi conicâ irregulari, latere exteriore truncato, interiore dorso obliquo emarginato excurrens, cuspide posticâ latâ, abbreviatâ, truncatâ, tuberculo minimo interiore; *quartus* cuspidibus pluribus inæqualibus, aliis apicibus truncatis, marginatis, subprominentibus, aliis acutis, mamillaribus, abbreviatis; *quintus* longissimus multicuspidatus, cuspidibus interioribus truncatis, exterioribus acutis.

Caput subglobosum, magnum; *facies* subrotunda; *genæ* tumidæ; *frons* plana, elongata, lata. *Lingua* scabriuscula. *Rostrum* breve, conicum, latissimum. *Rictus* mediocris. *Rhinarium* obtusum; *nares* terminales. *Auriculæ* breves, acutæ, posteriores, distantes, villosæ. *Oculi* rhinario approximati, anticè positi. *Maxilla* intumescens. *Mandibula* subrecondita. *Vibrissæ* mastacales nonnullæ, albæ.

Collum breve.

Corpus magnum, cylindricum, obesum, codario villosissimo et pilis longis, æqualibus, molliusculis, basi lanuginosis, vestitum.

Cauda longitudine corporis, basi amplissima, cylindrica, versus apicem subattenuata, villis longissimis patentibus vestita.

Pedes

Pedes plantigradi, pentadactyli. *Plantæ* lanugine mollissimâ dense vestitæ. *Ungues* falculæ, compressæ, arcuatæ, acutissimæ (retractiles).

The body above is of a beautiful fulvous brown colour, which on the back becomes lighter, and assumes a golden hue. The brown colour extends with a somewhat deeper shade to the neck, the sides of the head and the ears posteriorly; and a band of the same colour arises from the eyes and unites to the back of the neck. The face, snout, and the ears are white; a few fulvous and yellowish hairs are mixed with the white covering of the forehead.

The abdomen and extremities are black, and separated by a defined line from the colour of the upper parts. The tail is banded alternately fulvous-brown and yellow, and tipt with black. The woolly covering of the soles of the feet is of a gray or blackish colour. The dimensions of this animal are,

Length of the head	$7\frac{1}{2}$ inches.
——— from the occiput to the root of the tail	$19\frac{1}{2}$ do.
——— of the tail	15 do.
Total length	42 inches, or 3 ft. 6 in.

The peculiarities of our animal, on which its rank as a genus depends, are striking and prominent; but its disposition in a natural series is still obscure, as it resembles in several characters the individuals of that subdivision of digitigrade carnassiers, from which it differs essentially both in its teeth and in its plantigrade walk. Among the peculiarities of our animal are to be noticed the great breadth of the rostrum and the singular structure of the teeth: but the most remarkable character, and that on which its distinction principally depends, is the form of

the projecting points of the posterior grinders. This character, as far as our observation extends, is peculiar; it does not exist, except in a small degree, in any other genus of carnivorous quadrupeds. The truncation, carefully described in the generic character, is owing, in our opinion, to original structure, and is not produced by the wearing down of the points. We observe it both in the skull of a young animal and in that of the adult specimen, from which the annexed drawing was made; and our description is confirmed by a careful comparison of the relative elevation of the points of the two anterior grinders, in which, although they are equally exposed to attrition, this truncation is not observed. The margins bounding the truncated points, as is shown in the drawing, are circumscribed and perfect, exhibiting no signs of being worn down by attrition. In the disposition and even in the form of the teeth, our animal bears some resemblance to the genera *Nasua* and *Procyon;* but these differ essentially in the lengthened form of the head, and in the extended rostrum, which is terminated by a flexible rhinarium; they also differ in the number, character, and distribution of the grinders. *Nasua* and *Procyon* have in both jaws six grinders, of which the three anterior are false grinders; and of those which follow, none of the points, even in the adult state, exhibit the truncation above described in the generic character. Our animal has only one false grinder, with a compound crown, and the four posterior grinders are large and highly complicated: the first of these in the upper jaw corresponds with the fourth grinder in *Nasua* and *Procyon*, and the points are attenuated and acute; but the posterior grinders are quite peculiar and characteristic in their structure.

Its haunts are about rivers and mountain-torrents. It lives much in trees, and feeds on birds and the smaller quadrupeds. It is frequently discovered by its loud cry or call, resembling

A

B

W. Taylor, fecit.

bling the word *Wha*, often repeating the same: hence is derived one of the local names by which it is known. It is also called *Chitwa**.

REFERENCES TO TAB. II.

A. Lateral view of the teeth in the upper jaw, as they are seen within.
B. The same, as they are seen without.
C. Lateral view of the teeth in the lower jaw, as they appear within.
D. The same, as they appear without.
E. Front teeth: (*a*.) upper, (*b*.) lower jaw.
F. Anterior foot; left side.
G. Posterior foot; right side.
H. Sole of one of the posterior feet, to show its hairy covering.

* The publication of the foregoing paper has been delayed by the circumstance of waiting for the author's return to England, when he brought with him a second skull from India of the same species. It is only since this Part of the Society's *Transactions* has been printing, that he has found time to look into the subject; and on doing so, it is found that a description and figure of this interesting animal has been recently published in the 50th Number of the "*Histoire des Mammifères*," by M. Frederic Cuvier, under the name of *Ailurus fulgens*. The passage which imposed a different name has therefore, with the consent of the author, been suppressed; but the remainder of the information is too important to be omitted.—[*Note by the Secretary*.]

VIII. *Description of two new Birds from Nepaul. By Major-General Hardwicke, F.R.S., and F.L.S.*

Read March 21, 1826.

Genus. Lophophorus. *Temm.* Phasianus. *Linn.*

WALLICHII. *L. capite cristato nigrescente, regione periopthalmicâ nudâ coccineâ; collo pectoreque griseis nigro-fasciatis; dorso ferrugineo-aureo nigro-variegato; alis abdomine rectricibusque pallidè ferrugineo-brunneis, his nigro ferrugineoque fasciatis, illis nigro-variegatis.*

The local name of this bird is *Cheer*. It is a native of the Almorah Hills, on the north-eastern boundary of Hindostan, and is about the size of the Impeyan Pheasant of Latham. It is remarkably bold, and fights with great vigour on the least irritation, at the same time raising its feathers and prating with a noise which resembles the word *Tuckraa*, *Tuckraa*, several times repeated.

The bill in size and shape very much resembles that of the Impeyan Pheasant; but is in length something less than two inches, much hooked at the end, and covering the apex of the lower mandible.

The eyes are large, surrounded with a broad naked space of an irrregular lozenge shape, broader beneath the eye than above, and pointed before and behind, of a crimson-red colour,

and

and its surface covered with fine granulated papillæ. The base of the bill is covered with a cere, but not coloured; the pupil of the eye round and black, the irides brown, surrounded externally with a narrow ring of black.

The legs are gray, rather short for the size of the bird, and armed with one awl-shaped spur upon each.

The plumage is a handsome mixture of gray, light-brown, and black; the first being limited to the head, the breast, and part of the abdomen. The brown prevails on all the upper parts (except the head), and the feathers are margined with lunate-shaped bars of black, extending to the superior coverts of the tail. This last is cuneiform, consisting of twelve or fourteen unequal feathers, lying in two inclined planes, the two middlemost greatly longer than the others, and all handsomely crossed with straight bars of black on a light-brown ground.

The colour of the head is darker, inclining to black; and from the crown of the head to the occiput rise a few long slender feathers with broader tips, forming a crest inclined backward.

This bird bears the Bengal climate very well, and with little care and trouble might be brought alive to England. The hen differs but little from the male,—wanting the crest and spurs,—and the females yet seen wanted the two long feathers of the tail.

Genus. PHASIANUS. *Auct.*

GARDNERI. *P. supra brunneus, ferrugineo undulatim sparsus; capite, collo anteriori, abdomineque rufescentibus, hujus plumis in medio pallidè ferrugineo-lineato.*

This singular bird is a native of the Snowy Mountains north of the valley of Nepaul, and was procured through the zealous exertions of my friend Dr. Nathaniel Wallich, aided by the influence

influence of the English resident at Katmandoo (the Honourable Edward Gardner), without which no single article, of however little value, is obtainable by strangers from that jealous people the Nepaulese. It is the only subject of its kind obtained during Dr. Wallich's sojourning at Katmandoo; and as it appears to be an hitherto undescribed bird, it may also, from its scarcity at that place, be deemed a rare one in the country.

In size this bird comes near to *Phasianus cruentus*, and measures from the apex of the bill to the end of the tail $14\frac{1}{2}$ inches. The bill is black, short, robust, and the mandibles of nearly equal length ($\frac{3}{4}$ths of an inch), the upper one gently arched, the culmen rounded; the lower mandible straight, scoop-shaped, and obtuse at the apex; the base of the upper mandible is covered with a carmine-coloured cere, in which the nasal apertures are seated. The eyes are surrounded with a narrow naked space of similar colour, the irides brown bordered by a narrow ring of black; the pupil black. The legs are of a rufous brown: on the left is a single conical spur, with the rudiment or tubercle of another beneath it; but on the right leg neither of these appendages is evident.

The prevailing colour of the plumage is a rust-coloured brown blended with extremely narrow undulated lines of black, which are most numerous on the back, wings, and tail, and producing there a darker shade. The breast, neck, and cheeks, are of a lighter rust-colour. About the head the feathers are a little larger; those on the crown gray, and longer, with divided webs, rising into a moderate-sized crest, which bend gently backwards. The wings are short, reaching to about the roots of the tail-feathers; the coverts almost obscured by the softness and uniformity of the feathers. The tail, which consists of subequal rounded feathers, is slightly tapered at the end, and is in length about five inches.

The

The subject from which this description is taken, is in the Museum of the Society.

This bird, together with the *Phasianus cruentus*, forms a small group which deviates from the typical characters of the true *Phasianus* by the bill being short, greatly rounded, and blunt at the *apex*; by the tail being shorter and rounded; and by the scales of the *tarsi* being more numerous and closer to each other.

IX. *A Description of the Australian Birds in the Collection of the Linnean Society; with an Attempt at arranging them according to their natural Affinities. By N. A. Vigors, Esq., M.A., F.R.S., F.L.S., and F.G.S.; and Thomas Horsfield, M.D., F.L.S., and F.G.S. Communicated by the Zoological Club of the Linnean Society.*

Read June 21, 1825; *and January* 17, 1826.

In submitting to the Linnean Society the following observations on the Ornithology of New Holland, which have been founded upon an examination of the birds contained in their valuable collection, we presume that little explanation, much less apology, is necessary for the mode in which our researches have been conducted. The mode, we need scarcely premise, accords with those principles which have been introduced into zoology by one of the most distinguished naturalists of this Society, and is founded upon the affinities and analogies of the groups of the animal world, with the view of ascertaining their station in nature.

In regulating our researches according to these principles, we have found it necessary to make some partial alterations in the nomenclature which has been generally adopted in this country, until lately, for the groups of ornithology. And in introducing this modification of the scientific terms of Linnæus, we feel some apprehensions that we may be supposed to deviate from those principles of our great master, which the naturalists of this coun-

try

try have so long and so justly followed. But nothing can be more unfounded than such a supposition. Devoted as our leading zoologists have hitherto been to Linnæus, they have not evinced a more sincere attachment to his precepts than the authors of the following Catalogue. In point of fact, the apparent deviation from the "*Systema Naturæ*," in our attempt to arrange the ornithology of New Holland, and in similar undertakings of the present day, will be found, when strictly investigated, to be more in word than in reality. It would be superfluous to call to the recollection of the Society how important has been the increase of knowledge in every branch of natural history since the days of Linnæus. That increase, in the particular department upon which we have entered, rendering the subjects even now above five times more extensive than when that pre-eminent naturalist undertook to arrange them, has raised his subordinate groups into groups of a considerably higher value than they originally possessed. Those divisions which he instituted as the next superior groups to species, and which he denominated genera, have swelled out by the vast accumulation of species and the endless variety of new forms comprised in them, into what are now considered families, or into assemblages of even still more extensive signification. In such a change of materials, a corresponding change in their denominations appears essentially necessary: the groups, which were once termed genera, require a more comprehensive title; and the before-unnoticed modifications of form that spring up and constitute subordinate groups among them take the place which they have left, and, assuming the rank, demand the name, of genera. Such, in fact, is the natural course of our science; and such will ever be its progress, while information continues to increase.

On our turning to the examination, however, of the original groups of Linnæus, limited as they confessedly were in his days

as to the number of species, still we must observe that they appear to us, when judiciously modified and faithfully interpreted, not merely to embrace all the later acquisitions of science, and to include them within the bounds prescribed by their natural affinities, but to evince an almost intuitive insight on the part of that great master into the laws of nature. We have been accustomed, indeed, to contemplate with astonishment the expansiveness of those views with which he anticipated the modifications of form which have been brought to light by succeeding researches, and provided a station for them in his system suited to their place in nature. In but few instances have we seen cause to object to those leading views; and a slight modification will stamp even these few instances as of equal value with the rest. On the other hand, we are free to confess that among the various systems of ornithology which have arisen professedly to supersede his principles of arrangement, we see everywhere what appears to us to be an unfaithful representation of nature. When we adhere, then, to the principles of Linnæus, and to those grand and leading divisions which he has portioned out for our instruction, although with a modification of the terms of his nomenclature,—a modification which the fleeting nature of nomenclature itself renders necessary, and to which the scientific language of our own days must submit in its turn,—we conceive that we pay the most genuine homage to his genius and reputation. Were we, on the other hand, to adhere strictly to his nomenclature, and endeavour to square it to the gigantic mass of materials that is progressively increasing upon us, we consider that we should endanger his reputation by exposing the inadequacy of his system to any practical purposes, and thus prove ourselves by ill-judged adulation to be the mere lip-worshippers of his name.

It is thus, by adhering to the general views of Linnæus, but partially

partially remodelling the terms of his nomenclature, that we conceive ourselves strictly to derive our principles from him. We are willing to go even so much further as to assert that those naturalists, who in the present advanced state of science would have us bind ourselves exclusively to his nomenclature, virtually run counter to the spirit of his precepts. Had he left us only what he called his "System," this fact might not appear so evident. But he has left us what is even of more value, if possible,—his opinion of that system, and of its insufficiency for any purpose but to meet the limited knowledge of his age. He pointed out* to us how far it was a mere outline of the material world, to be filled up as increasing information would furnish the details,—how far it was a mere substitute for that more ample view of nature, of which succeeding ages might hope to obtain a glimpse. He saw, in fact, the promised land

* We allude to those sketches of the vegetable kingdom, which, with the modesty always attendant on true genius and information, Linnæus styled "Fragments of a Natural Method." In these the first glimpse is given of that improved mode of symbolical representation by which we may hope, as knowledge increases, to communicate with some degree of accuracy our ideas respecting the groups of nature. The deficiency perceptible in these "Fragments" is expressly stated to have originated in the deficiency of materials, which more extensive knowledge would serve to supply;—"defectus nondum delectorum in causâ fuit quod methodus naturalis deficiat, quam pluriuin cognitio perficiet; natura enim non facit saltus." (*Phil. Bot.*) We cannot give a more just description of the genuine merits of Linnæus with respect to his views of arrangement, than by transcribing the words of the author of the "*Horæ Entomologicæ*," who, after stating that "he honours the memory of that great man," not on account of "his precision of description," nor of "his learning in synonyms," nor of "his having been a happy inventor of words," asserts, "that his glory is built on much more stable foundations: for the man who first pointed out the distinction between the natural method and an artificial system; who first perceived the impossibility of giving either accurate definitions or characters to natural groups; and who first remarked the existence of intermediate genera between natural orders, must always be considered as one of the principal founders of our knowledge with respect to the natural system, whensoever this shall appear."—*Horæ Ent.* Pref. p. xx.

before

before him; and he equally saw, that the limits allotted to the life and the labours of man did not permit himself to enter it. But he lived sufficiently long to conduct the followers of nature to the Pisgah of science, and to show them, in his prophetic admonitions, the abundance of the territory which lay within their reach, and the paths through which they might hope to occupy that land of promise. It is not, we conceive, too presumptuous to affirm*, that he would himself have followed the same paths which we are now all pursuing in conformity with his instructions, had he lived to accompany and regulate our movements.

Were there to exist, however, a case in which it would be allowable for a disciple of Linnæus to depart not only from his mode of nomenclature, but even from his general principles, that case is now before us. The subjects which we have attempted to arrange come from a country scarcely more than the name of which was known in the days of Linnæus. And it is to be recollected, that in the variety and novelty of the forms of its animal productions, that country presents an almost totally insulated character. Among the number of birds which are now in the Society's museum, and which are daily increasing our Australian collections, not much above ten, certainly not twenty, species could have come under the inspection of Linnæus; and these are species merely which are common to the islands of the

* In hazarding the above assertion, we shelter ourselves under the following observations of one of the most acute and scientific naturalists of our age:—"Jam hujus loci non est, magnum numerum novorum generum contra illos defendere, qui omnes species, quamvis alienissimas, ad genera Linnæana revocari jubent. Mihi certe sententia stat, *Linnæum, ubi omnes species hodie notas vidisset, primum ipsum in novis generibus condendis fuisse*; ut vera erga virum immortalem veneratio nobis injungat, ea quæ aliorum erroribus inductus male disposuerat, aut quæ cum generibus ejus non bene congruunt, rectius distinguere et apte collocare; *quod illius jussu fecisse videbimur.*"—*Illiger, Prod. Mamm. et Av.* p. xiii.

Indian

Indian ocean, or which, according to the varied laws that regulate the geographical distribution of the groups of ornithology, are scattered almost indiscriminately over the globe. Beyond these few instances, not only every species is new, but almost every form is distinct from those which were familiar to Europeans half a century ago. For such productions consequently no generic names or minuter characters are to be found in the works of Linnæus. And when we consider the totally new and apparently anomalous peculiarities of these productions, it would not be altogether unreasonable to suppose that no place could be found, even in the greater divisions of his general system, where they might be assembled according to their natural affinities. But this is far from being the case. His mode of interpreting the general laws of nature was so penetrating, and at the same time so comprehensive, that provision is made in his primary and leading divisions even for these novelties and apparent anomalies. In including them, therefore, within the pale of his system, merely by partially modifying and liberally interpreting it,—and interpreting it solely according to his own instructions,—instead of making the arrangement which includes these productions a large and unsightly excrescence of that system, or a distinct, nay, a contradictory appendix to it, we consider that we not merely do justice to the comprehensiveness of his views, but confine ourselves within the strict principles of the school which looks up to him as its founder.

We feel much gratification in being able to state, that since we commenced our examination of the birds in the Society's collection, we have had the good fortune to obtain some valuable information respecting the habits and internal structure of many of the species; and we may add, that we have a few important facts in natural history to communicate, and several extensive and strongly characterized groups to exhibit for the first time with

with their distinguishing peculiarities, which we conceive will prove of interest to the Society. We are indebted for much of this valuable information to Mr. Caley, who collected the greater part of the New Holland birds belonging to the Society; and who kindly allowed us to make use of his original notes on these birds, written during his residence in the colony. We have also to express a similar acknowledgement to Mr. Brown, who, in his general zeal for science, did not neglect the interests of zoology while devoting himself to the advancement of his favourite study. To his liberality the Society is indebted for many of its choicest treasures; and the kindness with which he has communicated his information respecting them enhances their value.

Still we have to regret that we are but imperfectly acquainted with a considerable number of the more important forms in the collection, either as to their manners or their internal anatomy; and that many of our observations on them must necessarily be founded on conjecture. Great imperfection may consequently be expected in our details. A favourable prospect, however, opens to us of having our deficiencies supplied on many of these points; but a prospect, which we scarcely know whether we should most rejoice in or lament. The removal of the late Secretary of this Society to an important official situation in the country whose ornithology we are about to investigate, encourages us to hope for much valuable assistance to our labours; while at the same time we cannot avoid regretting his temporary absence from a Society, which is bound to him by every tie of respect and gratitude. But the evils attendant on separation will be softened down on both sides by the continued intercourse which science thus fortunately holds out between us; and we shall be the less estranged, in being still participators in his eminent zeal for our common pursuit. We hope we do not

travel

travel out of the line of our duty,—while investigating a collection, which has already received, and which it is expected will continue to receive, so much benefit from Mr. MacLeay,—when we express our sincere wishes for a successful accomplishment of the objects of his mission, and a happy return to his country and this Society.

Ordo I. RAPTORES. *Ill.*

Fam. VULTURIDÆ.

The first order which meets our attention, as the first division of the *Typical Group* in Ornithology, is the *Raptorial Order*, or the *Birds of Prey*. Of these birds, again, the first subdivision that comes before us, as being the first department of the *Typical Group* of that order, is the family of *Vulturidæ*. Of this family the Society's collection possesses no specimen; nor have we as yet seen any species of it from New Holland. Dr. Latham, however, describes two species as natives of that country: but we have much doubt whether they will be found to appertain to the *Vultures*. One of these, his *New Holland Vulture*, seems to have a weak, straight, and elongated bill, with long and slender *tarsi*; and, as far at least as can be judged from a figure, bears a greater resemblance to a *Wading Bird* than to a *Bird of Prey*. The second species, the *Vultur audax* of the "*Index Ornithologicus*," which its distinguished author seems not to have described from his own observation, but from hearsay, as he states its size to be uncertain, does not appear to possess any characters in common with the *Vultures*, except a partial absence of feathers on the cheeks. From the account of its manners also, which are described as bold and courageous, so much so as to induce it to attack the natives themselves,—a circumstance, indeed, from whence it has derived its specific name,—we can scarcely feel

inclined to assign it a place among the proverbially slothful and cowardly *Vulturidæ*. The nearest approach to the characters of that family that has come under our observation among the birds of Australia is in the genus *Polyborus* of M. Vieillot, the partially naked cheeks of which are allied to those of the *Vultures*. That genus, however, possesses so many characters in common with the *Falconidæ*, particularly with the *Fishing Eagles*, that it is generally ranked in that family, but at that extremity of it which meets the family now before us. This genus *Polyborus* is said to assume much of the manners of the *Vultures*, and may perhaps be considered as in some degree to supply their place in Australia. But on this and similar points we do not at present wish to hazard an opinion. Conjecture may be allowed in some measure to supply the place of facts, when facts are incapable of being ascertained: but with so early a prospect of having our doubts cleared up upon every subject relating to the zoology of New Holland, it is perhaps more prudent merely to express them.

Fam. FALCONIDÆ.

In this family there are many species and many forms in the Australian Fauna. The forms, however, are such as are common to every other part of the world, with the exception of the genus *Polyborus*, to which we have just alluded, and which is confined to southern latitudes, although widely distributed as to its longitudinal extent. We may generally observe with respect to the groups of the *Falconidæ*, that they know no bounds as to their geographical distribution. Preying indiscriminately upon all species of the inferior animals, and not being confined, like many other tribes of birds, to a particular or a local food, the different forms that compose the family may readily be conceived to be dispersed all over the globe. Their powers of flight,

flight, moreover, are so great, that we need not be surprised at finding that even the same species will sometimes spread itself over the most distant regions. Such at least appears to be the fact, whatever may be the causes which produce it. An analogous fact is observable in the *Grallatorial* order, where the same considerations, added to the habits of migration common to the order, may probably account for a similar law of distribution. Among the *Natatores* also we may expect that the extensive powers of locomotion found in some of the groups of the order, suited as well to the water as to the air, may tend to their wide dispersion. A few instances consequently occur of an accordance between the birds we are about to describe, and some of the forms of the above-mentioned groups which are familiar to Europeans. But by far the greater portion of the groups of New Holland will be observed to exhibit peculiarities confined to their own neighbourhood.

Subfam. ACCIPITRINA.

Genus. ASTUR. *Bechst. et Auct.*

1. NOVÆ HOLLANDIÆ*. *Ast. albus, rostro nigro, cerâ, orbitis, pedibusque flavis.*

Falco

* Were we to follow a practice which has become very general among modern naturalists, we should alter the specific name of the above bird, in consequence of its being derived from a local source. We consider this practice, however, although sanctioned by high authority, to be altogether founded in error. In giving local names, it is not inferred that the species is found only in the country which affords the denomination; much less that it is the only species of the group found there. All that is inferred is, that it does actually belong to the country. After all, names are of use only as they tend to point out the subjects for which they stand. And a name long established, although perhaps not the most appropriate, generally becomes so identified with the species as to call it to mind with greater precision than any new name, however significant. Few names indeed, however well chosen, can be exclusively appropriate to species; and a considerable number,—such as names intended to pay a

 compliment

Falco Novæ Hollandiæ. *Gmel. Syst.* i. *p.* 264. *no.* 69.
Falco albus. *Shaw, White's Voy. pl. in p.* 260.
New Holland White Eagle. *Lath. Gen. Hist.* i. *p.* 217. *no.* 146.

In Mr. Caley's MSS. we find the following observations on this bird:—"*Milk-white Hawk.* This bird was shot near Duck-river, which is a branch of Port Jackson harbour, about two miles from Paramatta on the road to Sydney. I have seen the species very sparingly. The natives tell me it feeds upon fish. Its weight is 1 lb. 12 oz. The *irides* are light olive, but with a shade of yellow.—*Feb.* 1809."

There are two specimens of this bird in the British Museum, and we have seen two other specimens exactly according with ours, which were lately brought to this country from New Holland. We have also heard of some other specimens. We have therefore little doubt of its being a distinct species, and not the white variety of another, as suggested by M. Cuvier in his "*Regne Animal**."

2. RAII. *Ast. supernè cineraceus, subtus albus fusco-variegatus, rectricibus pallidè cineraceis, subtus albescentibus fusco-fasciatis.*

Rostrum nigrum. *Gula* alba lineis fuscis gracilibus notata. *Pectus* fusco-lineatum. *Abdomen* fusco-fasciatum. *Scapu-*

compliment to individuals, or names expressing a native or provincial designation,—can be of little use in pointing out a species. Local names, unless actually misapplied, (in which case they should of course be altered,) will be at least as appropriate as these. On the whole, we consider the multiplication of synonyms, and the confusion necessarily resulting from it, to be a greater error in nomenclature than the want of significance in a specific name. And although, from the circumstance of objections having been started against local names, we agree that they should be sparingly used in future; yet when once they have been established, we conceive it more prudent to retain them, acting upon the only sure ground which can be assumed in all such cases,—the ground of priority.

* Tom. i. p. 320.

lares

*lares tectrices*que fuscæ, ad basin albæ fusco-variegatæ. *Rectrices* fasciis plurimis fuscis instructæ, pogoniis internis albo-marginatis. *Pedes* pallidi; *ungues* nigri. Longitudo *corporis*, $15\frac{1}{2}$; *alæ* a carpo ad remigem quartam, $10\frac{1}{2}$; *caudæ*, $8\frac{1}{2}$; *mandibulæ* superioris, $1\frac{1}{8}$, inferioris, 1; *tarsi*, $2\frac{3}{4}$.

Memoriæ JOANNIS RAII, *Zoologicorum Britannicorum principis, hæc species perpulchra sit sacra.*

3. RADIATUS. *Ast. nigro radiato-maculatus, corpore ferrugineo, alis caudâque elongatâ fuscis.* Lath.

Falco radiatus. *Lath. Ind. Orn. Supp. p.* xii. *no.* 40.
Autour radieux. *Temm. Pl. Col.* 123. *Juv.*
Radiated Falcon. *Lath.* i. *p.* 222. *no.* 153. *pl.* xi.

4. FASCIATUS. *Ast. supernè fusco-brunneus, subtus albidus, confertim fusco-brunneo-fasciatus, femoribus rufo-fasciatis.*

Rostrum nigrum. *Remiges* supernè fusco-brunneæ, pogoniis internis rufo-marginatis, fusco-fasciatis; subtus albidæ, fusco-fasciatæ. *Rectrices* supernè fusco-brunneæ, subtus albidæ, fasciis plurimis nigris instructæ; pogoniis internis supernè rufescentibus, fusco-fasciatis. Longitudo *corporis*, Maris $16\frac{1}{2}$, Fœm. $19\frac{1}{2}$; *alæ* a carpo ad remigem quartam, Maris $10\frac{1}{4}$, Fœm. 12; *caudæ*, Maris 8, Fœm. 9; *mandibulæ* superioris, Maris $\frac{7}{8}$, Fœm. $\frac{15}{16}$; inferioris, Maris $\frac{3}{4}$, Fœm. $\frac{13}{16}$; *tarsi*, Maris $2\frac{3}{4}$, Fœm. $3\frac{1}{4}$.

This bird is called in New Holland the greater *Bilbil*, as we are informed by Mr. Caley. *Bilbil* seems to be a general name for several species of *Hawks*.

5. APPROXIMANS. *Ast. supernè fusco-brunneus, subtus albidus brunneo-variegatus; femoribus rufo-fasciatis, rectricibus obscurè fusco-fasciatis subtus pallidioribus.*

Rostrum

*Rostrum pedes*que pallidè plumbei. *Caput, collum, pectus*que lineis latis brunneis notata. *Abdomen* fasciis latis brunneis notatum. *Remiges* internè rufo-marginatæ, obscurè fusco-fasciatæ: subtus pallidiores, ad apicem fuscæ, brunneo-fasciatæ. *Rectrices* brunneæ, internè rufo-marginatæ; subtus pallidiores, fasciis plurimis fusco-brunneis instructæ. Longitudo *corporis*, 19; *alæ* a carpo ad remigem quartam, 12; *caudæ*, 10; *mandibulæ* superioris, 1, inferioris, $\frac{7}{8}$; *tarsi*, $3\frac{1}{4}$.

This species bears a great resemblance to both the last in its colours and the general distribution of them; and we have had some doubt as to our bird being the young of one of them. But we consider that the *fasciæ* on the *abdomen*, which are broader and less frequent than those on the same part in *Ast. fasciatus*, form a sufficient mark of distinction between the two species; while its greater size and stronger *tarsi* equally separate it from *Ast. radiatus*. The *tarsi* of this latter species are, comparatively speaking, slender, and bring it near the group of *Accipitres*.

Genus. ACCIPITER. *Raii et Auct.*

1. TORQUATUS. *Acc. supernè cineraceo-fuscus, nuchâ rufescente; subtus albidus, rufo-fasciatus.*

Falco torquatus. *Cuv.*
Autour à Collier roux. *Temm. Pl. Col.* 43.

Juv. *Acc. supernè cineraceo-fuscus, albido-variegatus, subtus albidus, pectore fusco-lineato, abdomine fasciis rufo-fuscis latis notato.*

Autour à Collier roux jeune. *Temm. Pl. Col.* 93.

Mr. Caley says, "the native name of this *Hawk* is *Bilbil*. It is a bold bird, and makes great havoc among chickens. I once witnessed

witnessed it in the act of darting at a *Blue Mountain Parrot*, which was suspended in a cage from the bough of a mulberry-tree within a couple of yards of my door.—The *irides* are yellow. The length of the male is 12½ inches, of the female, 14½."

Subfam. Falconina.

Genus. Falco. *Linn. et Auct.*

1. Peregrinus. *F. cerâ pedibusque luteis, corpore suprà cinereo fusco-fasciato, subtus ex rufo albo; tæniis postocularibus nigris, caudâ albo-punctatâ.*

Falco peregrinus. *Raii Syn. Av. p.* 13. *no.* 1.
Le Lanier. *Pl. Enl.* 430.
Le Faucon. *Ib.* 421.
Peregrine Falcon. *Selby, Ill. of Brit. Orn. pl.* 15.

Upon a minute comparison of the specimen before us in the Society's collection, which is in a fine state of preservation, with some European specimens of this species, we can discover no material difference between them. The native name of this bird is *Wolga*. The eyes, Mr. Caley observes, are of a blueish black; the *irides* having a faint shade of hazel-brown in a strong light.

2. Cenchroides. *F. supernè rufus, subtus albidus, pteromatibus remigibusque nigris, rectricibus pallidè cineraceis, fasciâ nigrâ latâ prope apicem album.*

Fœm. *F. supernè rufa, subtus albida, pteromatibus remigibusque fuscis, rectricibus rufis graciliter fusco-fasciatis, fasciâ latâ fuscâ prope apicem album.*

Caput rufum, nigro-lineatum. *Dorsum scapulares*que rufæ nigro parcè notatæ. *Tectrices*, maris nigræ, fœminæ fuscæ, rufo-maculatæ; inferiores albæ. *Gula femora*que albæ.

Pectus

Pectus rufescenti-albidum, rhachibus rufis. *Remigum* margo internus albo angulatus, rufo-variegatus. *Rectrices* subtus albæ. *Rostrum* pallidum apice nigro. Longitudo *corporis*, $12\frac{1}{2}$; *alæ* a carpo ad remigem secundam, 10; *caudæ*, 6; *rostri*, $\frac{5}{8}$; *tarsi*, $1\frac{1}{2}$.

"This bird," as we are informed by Mr. Caley, "is called *Nankeen Hawk* by the settlers. It is a migratory species. My specimens were shot in May and June 1803. At that time the species was plentiful; but ever afterwards I observed it but sparingly. On the 3rd of August 1804, I made the following note:—I saw no *Nankeen Hawks* this autumn.—I never observed it attacking the fowls."

The species is closely allied to a group which is noted for the general similarity and the corresponding disposition of its colours; and which includes our *Kestril*, *F. tinnunculus*, Linn, the Κεγχρις of Aristotle; the newly-characterized European species, *F. tinnunculoides*, Temm.; the African species, *F. rupicolus*, Daud.; and some others. The group may be observed to possess a greater shortness of wing than is usual among the true *Falcons;* a character, which points out the passage from those birds to the *Hawks*. Our species appears decidedly distinct from any of the group which we have met with.

3. BERIGORA. *F. rufo-brunneus, gulâ, collo, nuchâque pallidè aurantiacis, tectricibus remigibusque fusco-brunneis rufo-notatis, rectricibus cineraceo-brunneis rufo-fasciatis apice pallido.*

*Rostrum pedes*que plumbei. *Pteromatum remigum*que pogonia interna rufo-fasciata; externa, remigum quatuor extimarum pogoniis exceptis, rufo-maculata. *Tectrices* inferiores rufæ. *Remiges* subtus ad basin albidæ, ad apicem fuscæ. *Femora* parcè

parcè rufo-marginata. *Uropygium, rectrices*que fasciis rufis plurimis instructæ, hæ subtus pallidiores. Longitudo *corporis*, 17—18; *alæ* a carpo ad remigem secundam, 14—15; *caudæ*, 8—9; *mandibulæ* superioris, $1\frac{3}{16}$, inferioris, 1; *tarsi*, $1\frac{1}{2}$.

β. variat *gulâ collo*que magis albidis quam aurantiacis, *rectricum*que fasciis minùs latis quàm in specimine typico.

The native name of this bird, which we have adopted as its specific name, is *Berigora*. It is called by the settlers *Orange-speckled Hawk*. Mr. Caley informs us, that the orange marks in the plumage of this species are considerably stronger in recent specimens than in those of the Society's collection, which are much faded. The specific characters of this bird accord very closely with those of Dr. Latham's "*Cream-bellied Falcon**;" but that bird is described as having a double tooth to its bill, while ours is singly-toothed as in the genuine *Falcons*.

Subfam. Milvina.

Genus. Elanus. *Sav.*

1. Melanopterus. *El. plumbeus, subtus albidus, remigibus nigricantibus, rostro humerisque nigris, caudâ albâ, pedibus flavis.* Leach.

Falco melanopterus. *Daud. Traité d'Orn.* ii. 152. *sp.* cxxiv.
Elanus cæsius. *Sav. Ois. de l'Egypte. p.* 98. *pl.* ii. *f.* 2.
Elanus melanopterus. *Leach, Zool. Misc.* iii. *p.* 4. *t.* 122.
Le Blac. *Le Vaill. Ois. d'Afr. pl.* 36, 37.

This bird is called by the natives *Najïngarring*, as we are informed by Mr. Caley, from whose MSS. we extract the following observations respecting it. "This species was very numerous in the autumn of 1803, that is, the autumn of New

* *Gen. Hist.* vol. i. p. 230. no. 165.

South Wales. I never observed it to attack the fowls; and I have some recollection of the natives telling me its principal food was field-mice. I have seen it at times hover in the air apparently motionless and stationary. It is a migratory species. I have noticed one as early in the season as February 9th, 1805. —The *irides* are reddish-orange."

The *Elanus melanopterus* appears to be spread over a vast extent of the Old World, being numerous in Egypt, and the greater part of Africa, as far as to the Cape of Good Hope. It has also been met with in various parts of India, in Java, and New Holland. There seems to be a considerable variation in the plumage of this species, the black markings of the wing spreading to a greater or less extent in different specimens.

Subfam. AQUILINA.

Genus. HALIÆËTUS. *Sav.*

1. CALEI. *Hal. rufescenti-brunneus nigro-variegatus, remigibus fuscis, rectricibus cineraceis nigro-fasciatis apice pallido.*

*Caput, pectus, abdomen, femora*que rufescentia, nigro-lineata. *Dorsi crissi*que plumæ, *scapulares, tectrices*que superiores pallidiores, maculis subtriangularibus nigris notatæ, rufo-marginatæ. *Remiges* supernè fuscæ, infrà albescentes, nigro-fasciatæ. *Rectrices* supernè cineraceæ, subtus albidæ, fasciis decem nigrescentibus notatæ. *Pedes* pallidi; *ungues* nigri. Longitudo *corporis*, 23; *rostri*, $1\frac{3}{8}$; *alæ* à carpo ad remigem quartam, 17; *caudæ*, 11; *tarsi*, $2\frac{3}{8}$.

Domini GEORGII CALEY, *peregrinatoris eruditi, sagacissimique observatoris, qui, per decem annos in Australiâ commoratus, Naturam in adyto suo, in agris, sylvis, montibusque coluit, hæc species, quam inter multas alias laboribus ejus debemus, nomine designetur.*

2. CA-

2. Canorus. *Hal. supernè ferrugineo-brunneus, pteromatibus remigibusque fusco-brunneis; subtus albidus ferrugineo variegatus.*

Caput, *collum*, *dorsum*, *scapulares*, *ptila*que pallidè ferrugineo-brunneæ, plumis ad basin albis, rhachibus fuscis. *Remiges* fusco-brunneæ, intimarum pogoniis internis ferrugineo-marginatis fusco-fasciatis. *Tectrices* inferiores ferrugineo-brunneæ albido-variegatæ. *Rectrices* pallidè fusco-brunneæ, pogoniis internis pallidioribus fusco-sparsis, subtus ad basin albescentes. Longitudo *corporis*, 21; *alæ* a carpo ad remigem quartam, 16; *rostri* ad rictum, $1\frac{1}{2}$; *caudæ*, $10\frac{1}{2}$; *tarsi*, 2.

We have felt much hesitation in describing this bird as a new species; the specimen in the Society's collection being in bad condition, and in particular much faded in colour. We considered it to bear much resemblance, as far at least as could be judged from a figure, to the young of Dr. Latham's *Falco Novæ Zælandiæ**, which species has been ascertained to belong to the Australian Fauna. But it does not so well accord with M. Temminck's figures of that species†, nor with those given in Forster's drawings in the Banksian library‡. We consider it best to record it for the present as a distinct species, with an expression of doubt, until more perfect specimens permit us to speak with certainty.

The native name of this bird is *Moru*, and also *Wirwin*, as we are informed by Mr. Caley. It is called the *Whistling Hawk* by the settlers. That gentleman adds, that "it makes a loud whistling noise when on the wing and sailing about in the air. It frequents the upper parts of the harbour (Port Jackson), par-

* *Gen. Hist.* i. p. 160. no. 84. pl. ix.
† *Pl. Col.* 192. ad 224. juv.
‡ Nos. 36, 37, 38.

 ticularly

ticularly about the Flats, a few miles below Paramatta. The natives tell me it feeds upon dead fish, and the bones (of fish I apprehend) which they leave. The Flats is a noted fishing place for the natives: the water there is shallow, and at ebb-tide a great portion of sand is left bare, which, with some marshy land adjoining, forms a convenient resort for several species of birds."

Genus. AQUILA. *Cuv.*

1. FUCOSA. *Aq. fusco-brunnea, capite scapularibus ptilisque ferrugineo-brunneis, remigibus femoribus caudâque cuneatâ fusconigris.*

Aquila fucosa. *Cuv. Règne Anim. pl.* iii. *f.* 1.
Aigle à queue etagée. *Temm. Pl. Col.* 32.

Fam. STRIGIDÆ.

Genus. NOCTUA. *Sav.*

1. BOOBOOK. *N. supernè brunnea, maculis parcis albido-flavescentibus; subtus albida, maculis ferrugineis variegata; digitis pilosis.*

Strix Boobook. *Lath. Ind. Orn. Supp. p.* xv. *no.* 9.
Boobook Owl. *Id. Gen. Hist.* i. *p.* 362. *no.* 66.

"The native name of this bird," as Mr. Caley informs us, "is *Buck'buck*. It may be heard nearly every night during winter uttering a cry corresponding with that word. Although this cry is known to every one, yet the bird itself is known but to few; and it cost me considerable time and trouble before I could satisfy myself respecting its identity. The note of the bird is somewhat similar to that of the European *cuckoo*, and the colonists have hence given it that name. The lower order of the settlers in New South Wales are led away by the idea that every thing is the reverse in that country to what it is in England:

England: and the *cuckoo*, as they call this bird, singing by night, is one of the instances which they point out. The *irides* are yellow." In his references to one of the specimens in the collection, a young male, Mr. Caley notices some variation in the colour of the *irides*.

2. MACULATA. *N. supernè brunnea, maculis rotundis albis notata, abdomine ferrugineo-brunneo, maculis grandioribus; digitis pilosis.*

Capitis frons albo parcè variegata; *occiput*, *nucha*, *pectus*que maculis albis parvis confertis notatæ. *Dorsum*, *scapulares*, *tectrices*que maculis paulò grandioribus rotundis albis parcè instructæ. *Abdomen* ferrugineo-brunneum maculis grandibus albis. *Remiges* fusco-brunneæ ferrugineo-fusco fasciatæ, fasciis pogonii interni ad basin albidis; primæ ad quintam inclusam pogoniis externis plùs minùsve albido maculatis: subtus pallidiores, fasciis basalibus albidis, apicalibus pallidè fuscis notatæ. *Rectrices* cineraceo-brunneæ pallido-fusco fasciatæ, fasciis pogonii interni prope basin albescentibus; primæ pogonio externo maculis albidis marginato: subtus pallidiores. Longitudo *corporis*, 11; *rostri*, $\frac{7}{10}$; *alæ* a carpo ad remigem tertiam, 8; *caudæ*, 5; *tarsi*, $1\frac{1}{2}$.

This bird much resembles the last species. Having however seen several specimens of it in fine preservation, we are at present inclined to consider it distinct. The chief points on which we ground this opinion are, that the latter bird is much smaller than *N. Boobook*, the colour is less ferruginous, and the white spots are much more frequent, and distinctly marked. The *fasciæ* on the tail-feathers also in our bird are more conspicuous.

Genus.

Genus. STRIX. *Linn. et Auct.*

1. FLAMMEA? *S. corpore luteo punctis albis, subtus albido punctis nigricantibus.* Linn.

Strix flammea. *Linn.* 1. *p.* 133. *no.* 8.
L'Effraie. *Pl. Enl.* 440.
Barn or White Owl. *Selby, Illust. of Brit. Orn. pl.* 24.

This bird varies from our European species in the buff colour being considerably darker, and the spots on the *abdomen* being larger and more deeply marked than is usual in our own. In our species, however, there is considerable variety; and as we have had an opportunity of examining but a single specimen from New Holland, and that in rather inferior condition, we do not wish to state with any confidence an opinion as to the identity of these birds.

Ordo II. INSESSORES.

Tribus. FISSIROSTRES. *Cuv.*

Fam. HIRUNDINIDÆ.

Genus. HIRUNDO. *Linn. et Auct.*

1. PYRRHONOTA. Lath. MSS. *Hir. suprà cæruleo-nigra, subtus fulvescens, fasciâ frontali ferrugineâ, uropygio fulvo, alis caudâque subfurcatâ fuscis.*

*Remiges rectrices*que subtus pallidè fuscæ. *Tectrices* inferiores fulvæ. Longitudo *corporis*, $4\frac{9}{10}$; *rostri* ad frontem, $\frac{1}{5}$, ad rictum, $\frac{1}{2}$; *alæ* à carpo ad remigem primam, $4\frac{3}{10}$; *caudæ*, $1\frac{1}{8}$; *tarsi*, $\frac{9}{20}$.

Dun-rumped Swallow. *Lath. Gen. Hist.* vii. *p.* 309. *no.* 38.

2. JA-

2. JAVANICA. *Hir. cærulescenti-nigra, subtus albida, fasciâ latâ frontali genis gulâ pectoreque ferrugineis, remigibus caudâque forficatâ fusco-nigris, rectricibus lateralibus albo-notatis.*

Remiges subtus *rectrices*que inferiores pallidè fuscæ. *Rectrices* externæ fasciâ albâ obliquâ, cæteræ laterales maculâ albâ subrotundatâ, in medio pogonii interni notatæ; duæ mediæ sine notâ. Longitudo *corporis*, $5\frac{4}{5}$; *alæ* ad remigem primam, $4\frac{1\,3}{2\,0}$; *rostri* ad frontem, $\frac{1}{5}$, ad rictum, $\frac{1}{2}$; *rectricis* externæ, $3\frac{3}{1\,0}$, mediæ, $1\frac{9}{2\,0}$; *tarsi*, $\frac{9}{2\,0}$.

Hirundo Javanica. *Sparm. Mus. Carls.* iv. *t.* 100.
Hirondelle Orientale. *Temm. Pl. Col.* 83. *f.* 2.

We have been led into a more detailed description of this bird than we usually give to an already described species, in order to point out the differences of its characters from those of our European *Hir. rustica*, with which it has been generally confounded. The chief distinction is in its inferior size; in the side-feathers of the tail being shorter, and at the same time less gracile; in the frontal band being wider, and in the ferruginous colour extending over the breast, in place of the broad black band which characterizes the European species. Our New Holland specimens accord accurately with the figures and descriptions of this species given by MM. Sparmann and Temminck from Javanese specimens. The migratory habits of these birds account for their wide dispersion.

In Mr. Caley's MSS. we find the following observations on these birds. "The resting-places of these *Swallows* are on the dead boughs of large trees, where I have seen several of them gathered together, in the same manner as European *Swallows*, on the roof of a house. I apprehend, however, that it is when their young have taken to flight that this occurs."

"The

"The earliest* period of the year that I noticed the appearance of *Swallows* was on the 12th of July 1803, when I saw two: but I remarked several towards the end of the same month in the following year (1804). The latest period I observed them was on the 30th of May 1806, when a number of them were twittering and flying high in the air.—When I have missed them at Paramatta, I have sometimes met with them among the north rocks, a romantic spot about two miles to the northward of the former place."

"The natives call the *Swallow*, *Berrin'nin*; they told me it built its nest in the hollow limbs of white gum-trees, using bark, grass, hair, or similar substances; but when it built in old houses it made use of mud. These old houses are the deserted huts of settlers, who have abandoned their worn-out farms; and the nests are constructed on the wall-plates, as they are called in the colony. Of the nests which have been brought to me, I have observed that the outside was made of mud and the inside lined with feathers. Though I have seen *Swallows* more or less almost throughout the year, yet it is my belief that they are migratory.—The eyes are black."

Fam. CAPRIMULGIDÆ.

Genus. CAPRIMULGUS. *Linn. et Auct.*

1. GUTTATUS. *C. suprà rubicundo-ferrugineus, fusco-maculatus, remigibus brunneis flavo-guttatis, guttis in seriebus quinque regulariter dispositis.*

Partes superiores *capitis colli* et *dorsi, tectrices*que *alarum* primæ ex rubicundo-ferrugineo, fusco, nigroque variegatæ: plu-

* We must bear in mind, that Mr. Caley's observations as to the earliness or lateness of the year have a reference to the year of New Holland.

mulæ

mulæ fasciolis transversis nigris alternis rectis, alternis undulatis, notatæ, ad latera rhachium maculis rhomboideis instructæ. *Pectus, abdomen, cauda*que subtus sordidè flavescentes, obscurèque fusco-fasciatæ. *Alæ* brunneæ; *remigum* pogoniis externis guttis orbicularibus regulariter circumscriptis, et in seriebus quinque parallelis dispositis, notatis; pogoniis internis fasciis transversis, guttis oppositis, instructis. *Remiges* omnium ordinum fasciolis semiellipticis terminatæ. *Pteromata* pogonio interno maculis orbicularibus minoribus guttata; *ptila* pogonio interno rufofasciata. *Rectrices* brunneæ, fasciis latis flavescenti cinereoque variegatis. *Tarsi* plumulis fuscis saturatioribus ad digitos usque vestiti. Longitudo *corporis* ab apice rostri ad basin caudæ, 5; *rostri* ad rictum, $\frac{17}{20}$; *tarsi*, $\frac{4}{5}$.

The only specimen of this bird contained in the Society's collection was injured before it came into the hands of Mr. Caley. It is however sufficiently preserved to show the genus to which it belongs, and to afford a clear specific distinction. The bill has all the characters of that of the true *Caprimulgus*, being weak, narrowed, and much compressed at the *apex*, with round and elevated nostrils: the legs also, like those of the same genus, are short, weak, and feathered to the toes, which are uneven, and have the middle nail serrated. The wings are more rounded than in other *Goat-suckers;* but this apparent deviation from the genus is probably owing to the mode in which the specimen has been prepared. The plumage above is nearly perfect; and the wings exhibit without any deficiency the beautiful series of regular round spots described above, from which the specific name has been derived. But the plumage of the abdomen, and of the under-parts generally, is defective. Mr. Caley informs us that the bird was picked up dead on his premises in its pre-

sent imperfect state, and was supposed to have been killed by a cat. Its native name, he adds, is *Wat'watkin*.*

Genus. ÆGOTHELES†.

Rostrum breve, crassiusculum, latissimum, basi depressum, tomiis integris, rictu amplissimo. *Culmen* carinatum, rotundatum, dertro unguiculato, subadunco. *Mandibula* inferior apice ad accipiendum superioris dertrum canaliculata.

* The following species of this genus, which has been kindly lent to us by Mr. Leadbeater for description, was received from New Holland, and does not appear to have been hitherto recorded.

ALBO-GULARIS. *C. brunneus nigro griseo fulvoque varius, abdomine fulvescente brunneo-fasciato, maculâ ovali obliquâ ad gulam utrinque albâ.*

Caput griseo-albo undulatim sparsum, lineis nigris in medio notatum. *Gula, regio ophthalmica, collum*que subtus brunneo-fulvo maculatæ: torque a gulâ ad nuchiam extendente e maculis fulvis composito; maculâ albâ grandi ellipticâ utrinque ad gulam. *Pectus* brunneum maculis obscurè albidis griseo-sparsis notatum. *Dorsum* brunneum strigis longitudinalibus griseo albidoque sparsis supernè, maculis fulvis parcis infrà, notatum. *Tectrices* superiores *scapulares*que saturatè brunneæ, fulvo griseoque parcè notatæ; inferiores brunneæ, fulvo-fasciatæ. *Remiges* saturatè brunneæ, omnium pogoniis, tribus primis exceptis, maculis fulvis utrinque notatis; secundæ et tertiæ maculâ fulvâ unicâ, tertiæ et quartæ maculâ albâ, pogoniis externis notatis; tertiæ maculâ albâ unicâ pogonio interno notato: subtus pallidè brunnescentes; tertiâ maculâ albâ utrinque, cæteris interioribus maculis albidis frequentibus notatis. *Abdomen* fulvum, brunneo-fasciatum, fasciis infrà minùs frequentibus. *Rectrices* saturatè brunneæ, mediarum pogoniis ambobus, cæterarum, duabus extimis exceptis, internis fasciis griseis brunneo-undulatis notatis; quatuor extimarum pogoniis internis, et duarum extimarum pogoniis externis, fasciis fulvis undulatis; subtus pallidiores, fasciis fulvis interruptis notatæ. *Rostrum* nigrum. *Pedes* brunneæ. Longitudo *corporis*, $14\frac{2}{5}$; *rostri* ad frontem, $\frac{4}{5}$, ad rictum, $1\frac{1}{10}$; *alæ* a carpo ad remigem secundam, $7\frac{4}{5}$; *caudæ*, 6; *tarsi*, $\frac{7}{10}$.

† *Αιγοθηλης*, *Caprimulgus*.—We revive the Aristotelian name of the *Goatsucker*. The word, although originally conveying an erroneous meaning, has been translated into so many languages, and, as such, has become so identified with the birds of this family, that we feel no hesitation in applying it to the present group.

Vibrissæ

Vibrissæ mastacales ad apicem simplices, ad basin pectinatæ; capistrales numerosæ, longissimæ, porrectæ, utrinque pectinatæ. *Nares* in medio rostri positæ, lineares, obliquæ, subpatulæ, posticè angustiores.

Alæ breves, rotundatæ. *Remiges* prima et sexta ferè æquales brevissimæ, secunda et quinta æquales longiores, tertia et quarta æquales longissimæ; secundæ pogonio externo leviter, tertiæ ad quintam inclusam pogoniis externis profundè emarginatis: secundæ ad quintam inclusam pogoniis internis emarginatis.

Pedes congrui. *Tarsi* elongati, subgraciles, compressi, nudi. *Digiti* liberi, subgraciles, ferè æquales. *Hallux* longus, debilis. *Ungues* compressissimi, medio integro. *Acrotarsia acropodia*que scutulata; horum scutis confertis approximantibus.

Cauda mediocris, rotundata.

The perfection of the family of *Caprimulgidæ* may be considered as most fully exhibited in the true *Caprimulgus*, Auct., of which the common European species is an adequate example. In that genus, which forms part of the typical group of the *Fissirostral* tribe of the *Insessores*, the chief characters that distinguish the birds of the tribe are strongly developed, namely, the powers of flight and of receiving their food within the wide gape of their bill when on the wing. The chief strength of the bird is thus centred in the wings and the *rictus* of the bill; and a proportional deficiency takes place in those other members which are less necessary to it in the performance of its peculiar functions. The bill itself is feeble, and apparently useless in securing its prey, which object is effected chiefly by a viscous exudation within the gape, and a regularly disposed network of strong bristles, which externally margins the *rictus*. The legs also

also are short and feeble, and the toes weak and irregular; the middle toe, however, is furnished with a serrated nail, which seems in some measure to compensate for the general deficiency of the member, the serration being apparently intended, as has been observed in a former volume of our "Transactions," for the purposes of seizure*. The present genus *Ægotheles* evidently exhibits a deviation from these typical characters. The wings lose the superior powers of flight displayed in the true *Caprimulgus*, and instead of being long and acuminated become short and rounded; the bill and legs assume somewhat of the length and strength usually attached to these parts; while as the latter members regain their general powers, the serration of the middle *unguis*, which accompanied the weaker conformation, entirely disappears. The rictal bristles also partially lose their strength and regularity of disposition; and here, as well as in the succeeding group of *Podargus*, seem to be transferred to the front or base of the bill.

The distinction between *Ægotheles* and the true *Caprimulgus* is thus sufficiently evident. From M. Cuvier's genus *Podargus* the former group also differs in its general comparatively weaker conformation, holding in this respect an intermediate place between *Caprimulgus* and *Podargus*. The bill is more depressed than in *Podargus*, and more generally widened towards the *apex*: the shape and the disposition of the *nares* also, as well as the structure of the quill-feathers, is different. The *tarsi* are weaker and more compressed, and at the same time comparatively more elongated; and the toes are nearly even, while in *Podargus* the middle toe is considerably longer than the rest. We have hitherto met with but one species belonging to this form which seems confined to New Holland.

* Vol. xiv. p. 407.

1. Novæ Hollandiæ. *Æg. fusco nigro albidoque nebulosus, subtus albidus, collo pectoreque fasciis obscuris, cristâ frontali erectâ setaceâ.* Lath.

Caprimulgus Novæ Hollandiæ. *Lath. Ind. Orn. p.* 588. *no.* 18.
Crested Goatsucker. *Phillips's Bot. Bay, pl. in p.* 270.

This bird is called by the natives *Teringing'*. Mr. Caley cannot exactly discover in his Notes where he met with his specimen; but as far as he recollects it was shot in the woods below Sydney.

Genus. Podargus. *Cuv.*

1. Stanleyanus*. Lath. MSS. *Pod. suprà fusco cinereoque fasciatus, capite maculis rhomboideis nigris notato, collo dorso tectricibusque nigro-strigatis; subtus cinereo sordidoque fulvo punctatus, nigro-strigatus, rictu amplissimo.*

Ptilosis superior ex fusco cinereoque varia, capite saturatiore; hujus plumulis transversè fasciatis, maculâ terminali rhomboideâ nigrâ. *Colli dorsique* plumæ fasciis latioribus punctulatis ornatæ; strigâ medianâ nigrâ, ad latera undulatâ, secundùm rhacheos longitudinem excurrente. *Remiges* primores fuscæ, saturatiores, fasciis intervallis æqualibus dispositis, in pogonio externo albis, in pogonio interno nigro et cinereo undulatis. *Remiges* secundariæ fasciis obscuri-oribus fusco-cinereoque undulatis notatæ. *Cauda* cuneata:

* Several species of the New Holland birds in the Society's collection were described by Dr. Latham in his "*General History*," but did not at the same time receive their scientific names, which were intended to appear in a second edition of the "*Index Ornithologicus*." Being unwilling in our present undertaking to anticipate the names of the first describer of these birds, we applied to Dr. Latham for permission to use his manuscript names, which he kindly granted. In the case of the species before us, he expressed his wish to dedicate it to Lord Stanley, who had presented him with the specimen from which he drew his original description; and we feel much pleasure in uniting with him in paying this well-merited compliment.

rectrices

rectrices intermediæ longiores, sequentes, per paria, gradatim breviores, exteriores abruptiùs abbreviatæ; omnes fasciis fusco cinereoque punctulatis undulatisque, obscuris. *Partes inferiores* diluto-cinereo et sordido-fulvo punctatæ, fasciis obscuris, rhachibus strigis nigris insignibus notatis; fasciis *gulæ jugulique* tenuioribus, strigis angustioribus. *Tarsi* flavescentes. *Rictus* amplissimus. Squamæ *narium* subpatulæ. Setæ *capistri* numerosæ, densæ, elongatæ, antrorsum spectantes. *Vibrissæ* mastacales deorsum versæ; margo mentalis vibrissis plurimis elongatis subdecompositis circumdatus. Longitudo *corporis*, 23; *alæ* a carpo ad remigem quartam, 12; *caudæ*, 10; *mandibulæ* superioris ad frontem, $1\frac{1}{2}$, ad rictum, 3; inferioris, $2\frac{1}{2}$; *tarsi*, $1\frac{3}{10}$.

Wedge-tailed Goatsucker. *Lath. Gen. Hist.* vii. *p.* 368. *no.* 38.

In honorem viri illustris, in Ornithologiâ præstantissimi, EDOUARDI *Baronis* STANLEY, *Societatis Linneanæ* PRO-PRÆSIDIS, *hæc avis nomen obtineat.*

2. HUMERALIS. *Pod. suprà cinereo-fusco sordidoque fulvo variegatus, capite dorsique lateribus insignè nigro-strigatis, fronte straguloque tenuiter albo punctatis fasciolatisque, fasciis duabus latis humeralibus fulvo alboque punctulatis; subtus strigis nigris fasciisque approximantibus sordido-fulvis tessellatus.*

Capitis plumæ strigâ latâ in medio notatæ, fasciâ albidâ, punctuli instar, præditæ: in fronte maculæ latiores fasciam albidam constituunt. *Cervix* sordido-fulvo cinereoque densè variegata, strigis longitudinalibus obscurioribus fasciisque terminalibus rarioribus instructa. *Parapterum* strigâ medianâ nigrâ insignè notatum; ad latera exteriora fasciolis fulvo cinereoque variegatis tæniam latam efformantibus. *Tectrices* superiores nigro, fusco, et cinereo variegatæ:

plumæ

plumæ complures, pogonio externo fasciâ latâ subterminali prædita, fulvo alboque punctulatæ, alas tæniis latis duabus exornant. *Remigum* primarum pogonia interna fasciis obscurioribus, externa fasciis albis insignioribus notata. *Cauda* fusco cinereoque variegata, fasciis saturatis nigricantibus instructa. *Partes inferiores* sordido-fulvo cinereo albidoque variegatæ; strigis nigris *colli* insignioribus undulatis; *abdominis* strigis nigris fasciisque fulvis transversim confluentibus. *Femora* plumis nigricantibus vestita. *Tarsi* colore corneo imbuti. *Rictus* dilatatione rictui *Pod. Stanleyani* vix æqualis. *Irides* flavi. Longitudo *corporis*, 20; *alæ* a carpo ad remigem quartam, 12; *caudæ*, $8\frac{1}{2}$; *rostri* ad frontem, $1\frac{1}{5}$, ad rictum, $2\frac{1}{5}$; *tarsi*, $1\frac{1}{5}$.

Cold River Goatsucker? *Lath. Gen. Hist.* vii. *p.* 369. *no.* 39.

The birds of this genus in the Society's collection bear such a general resemblance to each other, that we have felt some hesitation in describing them as different species. The careful examination of many individuals in their own country will alone determine with certainty whether they are distinct, or merely varieties of the same species from age or sex. With respect to the two foregoing species we have to observe that Dr. Latham, by the examination of other subjects, has been led to the same result as we have been by the comparison of the specimens in our collection; and has described these birds respectively as the *Wedge-tailed* and *Cold River Goatsuckers*. The chief differences between them are as follows: The *Pod. Stanleyanus* is somewhat larger than the *Pod. humeralis;* the colour of its plumage is more purely cinereous and brown, being almost without any mixture of tawny; the external marks are more delicate, and the gape of the bill is wider. The *Pod. humeralis* is distinguished by bold black longitudinal streaks, some of which are of considerable

siderable breadth, which mark the upper parts; by white dots or bands at or near the extreme points of the plumes of the head, forehead, neck, back, and adjoining parts of the wings; by a decided admixture of tawny among its colours; and by two strongly-marked fulvous bands, which cross the coverts of the wings. On the underside the transverse bands of the plumes meeting the longitudinal streaks along the shafts at right angles, afford a somewhat regularly chequered marking, which appears peculiar to this latter bird.

3. CUVIERI. *Pod. suprà cinereo brunneo albido fulvoque variegatus, graciliter nigro-strigatus, dorso scapularibus pteromatibusque saturatioribus, his albido fulvoque terminatis, remigibus fusco-brunneis maculis albis quadratis; subtus pallidior fusco-fulvo undulatus, nigro-strigatus; rictu minùs amplo.*

Vibrissæ capistrales nigræ apice albo-punctatæ. *Capitis* plumæ frontales albo notatæ, occipitales saturatiores, omnes strigis gracilibus nigris præditæ. *Colli, abdominis cervicis*que plumæ pallidiores nigro tenuiter strigatæ, strigis pectoralibus paulo latioribus. *Scapulares pteromata*que saturatiores, apicibus albo fulvoque notatis. *Remiges* primariæ fuscæ, pogonio externo maculis quadratis fulvo parcè punctulatis, pogonio interno fasciis obscuris albido fuscoque variis, notatæ; secondariæ, fusco fulvo albidoque undulatæ, variegatæque; interiores in medio nigro-strigatæ, apicibus albis. *Rectrices* fulvo cinereo albidoque variæ, fasciis obscuris albido nigroque punctulatis notatæ; prope apicem in medio nigro-strigatæ, subtus pallidiores. *Irides* brunneæ. Longitudo *corporis*, 16; *alæ* a carpo ad remigem quartam, 10; *caudæ*, 8; *rostri*, ad frontem, $1\frac{1}{10}$, ad rictum, $2\frac{1}{10}$; *tarsi*, $1\frac{3}{20}$.

In honorem principis Zoologorum, hujus generis fundatoris, hæc species nominatur.

This

This bird also exhibits so general a resemblance to the preceding species, that we should at once have referred it to it as a variety, were it not that it differs in its geographical situation, as well as in some minuter characters. It is a native of Van Diemen's Land, where it was met with by Mr. Caley, while the other species is found in New South Wales. That gentleman noted also that the *irides* of the present bird were brown, while those of *Pod. humeralis* were yellow. The chief difference in their plumage is as follows: The longitudinal streaks on the head of *Pod. humeralis* are bold and broad, diffusing a strong black shade over the head; those of *Pod. Cuvieri* are slender and more distant from each other, and leave the fuscous-brown of the head predominant. The *Pod. Cuvieri* wants the fulvous *fascia* on the shoulder, and the *fasciæ* on the tail are not so strongly marked as in *Pod. humeralis*. The bill also of the Van Diemen's Land bird is somewhat shorter than the bill of the other. We have seen a few other specimens of *Pod. Cuvieri* which came from the same locality as our specimen; as also some other birds of the New South Wales species: and those leading marks of distinction stated above seemed constant between them. At the same time we must observe, that there appeared much variation in the different specimens of each of these supposed species; and we consequently cannot speak with the same certainty respecting the difference of species in this group, as in groups less subject to variation. We therefore state our doubts on these points, while we follow the general plan which we have prescribed for ourselves in all such doubtful cases, of keeping apparent species distinct, until proof is given of their being identical.

Mr. Caley calls all these birds by the native name of *Benit'*. He observes that they are night birds, and seem stupified when found upon the wing by day.

Fam. TODIDÆ.

Genus. EURYSTOMUS. *Vieill.* (Colaris. *Cuv.*)

1. ORIENTALIS. *Eur. cæruleo-viridis, jugulo lazulino-strigato, remigibus rectricumque apicibus nigris, maculâ alarum cæruleâ.*

Coracias orientalis. *Linn.* i. 159.
Rollier des Indes. *Pl. Enl.* 619.

In Mr. Caley's MSS. are the following notices of this bird. "Its native name is *Natay'kin;* the settlers call it *Dollar Bird*, from the silver-like spot on the wing.—It is a noisy bird when on the wing, but mostly so in the evening, after other birds have gone to roost. It may then both be heard and seen on the tops of trees, particularly on dead branches, where it is most easily shot by so exposing itself. Its flight is much like that of the *Swallow*, but I have never observed it long upon the wing; as it generally betakes itself, as I before mentioned, to the top of some high tree or decayed branch, from whence it darts more readily upon its prey. At this time (the evening) the *Beetles*, which I have found in their stomachs, are upon the wing.—It is a bird of passage.—The earliest period of the year at which I have noticed it was on the 3rd of October 1809; and I have missed it early in February. It is most plentiful about Christmas."

This bird, which seems to spread itself very generally over the Eastern world, was originally placed by Linnæus among the *Rollers*, or his genus *Coracias;* and although it has latterly been formed into a distinct genus from that group, it has still been arranged next to it by the greater number of systematic writers. M. Vieillot observing the extreme width of the base of the bill, grouped it among the *Berry-eaters**, a family which he formed

* "Fam. 16. BACCIVORI."—*Analyse d'une Nouv. Orn. Elem.* p. 37.

out

out of the genus *Ampelis*, Linn., and some conterminous birds. He however still assigned it a station in the series of his genera, immediately subsequent to the Linnean genus *Coracias*. The bird evidently exhibits strong relations to both these groups. In its colours, its size and strength, and its general form, it bears a resemblance to the *Rollers;* while in the wide gape of the bill it equally seems to approach the broad-billed *Berry-eaters*. Judging, however, even from external characters, we have no hesitation in stating our opinion, that these relations are merely analogical, and that the natural station of the bird is in the tribe of *Fissirostres*, but at that extremity of the group where it joins the *Dentirostres*. The shape of the wing, evidently formed for a rapid flight,—the comparative shortness and weakness of the legs, indicating the pursuit of an aërial rather than of a terrestrial prey,—and the notched *apex* of the bill, denoting its food to be rather animal than vegetable,—all are characters which point out its affinity to the *Fissirostral* group, whose perfection consists in their powers of flight, and of inclosing their prey within their gape as they pursue it on the wing. The brilliant colours of this bird, which have hitherto led to its being placed among the *Rollers*, equally associate it with the present family of *Todidæ* and with the neighbouring *Halcyonidæ*: while the bill appears decidedly formed according to the same model as that of *Eurylaimus** and the conterminous group of *Podargus*. We had much pleasure in finding that our conjectures respecting the affinities of this group, which we had drawn merely from its external characters, were confirmed by the accounts of its habits and mode of life, which we have extracted above from Mr. Caley's manuscripts. We must observe in addition, that this naturalist, arranging his birds without any predilection for systems,

* See *Linn. Trans.* vol. xiv. p. 430; and *Zool. Researches in Java*, no. 2.

and in consonance merely with what appeared to him to be their natural affinities, of which he formed his judgement by actual observation of their manners, has grouped these birds in the same case with the *Caprimulgi*, *Podargi*, *Hirundines*, and *Artami*, in which situation they may still be seen.

Fam. HALCYONIDÆ.

Genus. DACELO. *Leach.*

1. GIGANTEA. *D. albida, capitis subcristati vertice maculâ post-oculari nuchalique dorso anteriori alisque fusco-brunneis, his cæruleo-variegatis; caudâ ferrugineâ fusco-brunneo-fasciatâ, apice albo.*

Dacelo gigantea. *Leach, Zool. Misc.* ii. *p.* 126. *pl.* cvi.

Alcedo gigantea. *Lath. Ind. Orn. p.* 245. *no.* 1.

Great Brown Kingsfisher. *White's Journ. pl. in p.* 137. *Phill. Bot. Bay, pl. in p.* 287.

This species is thus referred to in Mr. Caley's notes. "The settlers call this bird the *Laughing Jackass*, and the natives, as I think, *Cuck'unda*. It is common throughout the colony, at least in all the forest-land of the interior parts. It makes a loud noise, somewhat like laughing, which may be heard at a considerable distance; from which circumstance, and its uncouth appearance, it probably received the above extraordinary appellation from the settlers on their first arrival in the country. I have also heard it called the *Hawkesbury Clock* (clocks being at the period of my residence scarce articles in the colony, there not being one, perhaps, in the whole Hawkesbury settlement), for it is among the first of the feathered tribes which announce the approach of day. When sleeping in the woods, I have often found its singular noise most welcome in the morning.—Its habits were very different from those of the *Three-toed Kingsfisher*." (*Ceyx azurea*, Lacep.)

2. LEACHII.

2. LEACHII. Lath. MSS. *D. albida fusco-fasciata, capite fusco-lineato, dorso anteriori scapularibus alisque fuscis, his cæruleo azureoque variegatis, uropygio cæruleo, caudâ azureâ, apice albo.*

Caput subcristatum, albidum, fusco-lineatum. *Gula* albida. *Pectus, nucha, abdomen, crissum*que albidæ, fasciis fuscis gracilibus undulatæ. *Dorsi anterioris* plumæ basi albæ apice fuscæ, *inferioris uropygii*que basi fuscæ, medio albæ, apice cæruleæ. *Ptila* anticè brunneo-fusca, posticè apice cærulea. *Pteromatum* plumæ externè azureæ, internè fuscæ. *Tectrices inferiores* albidæ fusco-fasciatæ. *Remiges* ad basin albæ, pogoniis externis à medio azureis, internis fuscis. *Rectrices;* suprà, pogoniis externis azureis apice albis, trium externarum pogoniis internis albis fusco-fasciatis ferrugineo parcè variegatis, quartæ pogonio interno fusco prope rhachin azureo, duarum mediarum pogoniis internis azureis, externis fuscis; subtus, extimæ albæ fusco-fasciatæ, quatuor mediæ fuscæ apice albo. *Rostrum* fuscum, *mandibulâ* inferiori apice supràque albidâ. Longitudo *corporis*, $15\frac{1}{2}$; *alæ* ad remigem tertiam, $7\frac{4}{5}$; *caudæ*, $5\frac{3}{5}$; *mandibulæ* superioris, ad frontem, $2\frac{7}{10}$, ad rictum, $3\frac{7}{10}$; *tarsi*, $1\frac{3}{20}$.

New Holland Kingsfisher. *Lath. Gen. Hist.* iv. *p.* 11. *no.* 2.

In honorem GULIELMI ELFORD LEACH, *Medicinæ Doctoris, Societatum Regiæ et Linneanæ Socii, &c. &c., ornithologi eximii, qui primùm hoc genus detexit characteribusque illustravit, hæc species perpulchra nominatur.*

The specimen of this species in the Society's collection was presented by Mr. Brown, who discovered it, on the 24th of October 1802, in Keppel Bay on the East Coast. The species was subsequently met with at Shoalwater Bay, and Broad Sound, on the same coast.

Genus.

Genus. HALCYON. *Swains.*

1. CINNAMOMINUS. *Halc. cæruleo-viridis; pileo, collo, plumisque totis subtus pallidè cinnamominis; auribus viridibus; nuchâ torque nigro gracili ornatâ.* Swains.

Halcyon cinnamominus. *Swains. Zool. Illust. pl.* 67.

2. COLLARIS. *Halc. viridi-cæruleus, corpore subtus collarique albis.* Lath.

Halcyon collaris. *Swains. Zool. Illust. pl.* 27.
Alcedo collaris. *Lath. Ind. Orn.* 250. *no.* 14.
Sacred Kingsfisher. *Phill. Bot. Bay, pl. in p.* 156.

"This bird," says Mr. Caley, "begins to get noisy in the spring, and may be seen frequently. A pair of them had a nest annually, to the best of my recollection, in a large dried tree in my garden. After the breeding season they departed; but whether to the woods or to a greater distance I never discovered. From the circumstance of their appearing regularly in my garden and frequenting the above-mentioned dried tree, I considered them migratory."

3. SANCTUS. *Halc. cæruleo-viridis, torque nuchali abdomine pectoreque albidis ferrugineo-variegatis, hoc fusco-undulato, superciliis maculâ occipitali gulâque albis, tæniâ ante oculos ferrugineâ, collari occipitali strigâque suboculari nigris.*

Capitis plumæ frontales ferrugineo-marginatæ. *Dorsum* anterius *scapulares*que fusco-virides, *uropygio* cæruleo. *Tectrices* superiores ferrugineo-marginatæ, inferiores ferrugineæ. *Remiges* intùs apiceque fuscæ, cæruleo externè marginatæ; prima fusca externè ferrugineo-marginata, subtus fusca internè fulvo-marginata. *Rectrices* cæruleæ, pogoniis internis fusco-marginatis, subtus fuscæ. *Rostrum* fuscum,

fuscum, mandibulâ inferiori basi pallidâ. Longitudo *corporis*, $7\frac{1}{5}$; *rostri* ad frontem, $1\frac{3}{20}$, ad rictum, $1\frac{13}{20}$; *alæ* a carpo ad remigem secundam, $3\frac{13}{20}$; *caudæ*, $2\frac{3}{10}$; *tarsi*, $\frac{1}{2}$.

If the several birds, which have been described as varieties of the *Alcedo sacra* of Gmelin, be actually found to belong to that species, our bird may probably be added to the list. We have however much doubt of their being mere varieties. In the species of *Kingsfishers* which have been well ascertained, we find little variation of plumage; and we seldom observe such an extensive geographical distribution among them as is assigned to the *Alcedo sacra*. The various groups of this family moreover approach so nearly to each other in their characters, particularly in the distribution of their colours, that we need not be surprised at finding that most of the *Kingsfishers* of the islands of the Indian Ocean bear a general resemblance to each other, so as to appear at first sight varieties of one species. We have not materials sufficient in Europe to enable us to come to any decision on this subject: that must be determined on the spot. But with respect to our New Holland bird, we consider ourselves justified in keeping it distinct from the *sacred Kingsfisher*, until at least some strong grounds are advanced to prove it the same. It differs both from Dr. Latham's and Gmelin's original descriptions of *Alcedo sacra*, which were taken from a bird belonging to the Friendly Islands, by having a conspicuous collar round the neck; by the under parts being yellowish-white, varied with ferruginous and undulated with slight fuscous *fasciæ*, instead of being pure white; and by having a black streak running longitudinally before and behind the eye, with a black collar margining the hind part of the head, and a conspicuous white spot adjoining this collar on the *occiput*. The *Alcedo sacra*, moreover, is described as being more than nine inches in length, Gmelin making it nine and a half, while our bird scarcely exceeds

exceeds seven inches. Of all the alleged varieties of the *sacred Kingsfisher* the bird before us comes nearest to the description of those which are said to be found in New Zealand.

Genus. CEYX. *Lacepede.*

1. AZUREA. *C. saturatè azurea, corpore subtus lorisque flavescentibus, lateribus colli maculâ obliquâ albâ.* Lath.

Alcedo azurea. *Lath. Ind. Orn. Supp. p.* xxxii.

Alcedo azurea. *Swains. Zool. Illust. pl.* 26. *Lewin, Birds of N. Holl. p.* 5. *pl.* 1.

Mr. Caley thus observes upon this bird in his manuscripts. "I have never noticed this species leaving the salt water beyond the distance of two hundred yards, and seldom so far. It inhabits the harbour of Port Jackson, particularly the upper parts of the branches or creeks. Some birds have the breast considerably more red than others. I have met with what I considered to be the same species in a brushy creek at Western Port. I never saw it alight in trees."

Fam. MEROPIDÆ.

Genus. MEROPS. *Linn.*

1. MELANURUS. *M. viridis, tæniâ ante postque oculos lunulâ pectorali remigum apicibus caudâque nigris, occipite remigibusque castaneis, gulâ flavâ, tæniâ suboculari uropygio crissoque cæruleis.*

Rostrum nigrum. *Remigum* externarum pogonia extima viridia. *Cauda* nigra, *rectricibus* duabus mediis longissimis; harum pogoniis utrinque, primæque pogonio externo viridi-marginatis. Longitudo *corporis* ab apice rostri ad apicem mediæ rectricis, 10, ad apicem rectricis extimæ, 8; *alæ* a carpo ad remigem primam, $4\frac{1}{2}\frac{1}{0}$; *caudæ*, 5; *rostri* ad frontem, $1\frac{1}{5}$, ad rictum, $1\frac{1}{2}$; *tarsi*, $\frac{8}{5}$.

In

In Dr. Latham's first description* of his *Merops ornatus*, a New Holland species of this genus not in the Society's collection, a bird is alluded to, which was figured in Mr. Lambert's collection of drawings, and whose characters nearly accord with the bird before us. Dr. Latham conjectures it to be the female of *M. ornatus*. In the second edition of his work†, he repeats the same observation, but does not refer to the specimens in the Society's museum. One of the birds, however, in the collection is a male, as we find recorded in Mr. Caley's notes. Dr. Latham's conjecture respecting sex consequently proves erroneous. And the two specimens from which our above description is taken, according in every particular with each other, and exhibiting a fine state of preservation, are so distinct from *M. ornatus*, that we cannot consider ourselves authorised to come at once to the conclusion that they are varieties of that species. The tail in our bird is black, which in *M. ornatus* is chestnut; and the fore part of the head is of the same colour as the back, while in Dr. Latham's bird it is dull orange‡. Both these species differ from the *M. viridis* of Linnæus by their greater size; by the throat being orange-yellow instead of blue, and by having a conspicuous longitudinal streak of light blue immediately under the black band that passes beneath the eye. The *rectrices* also of the *Indian Bee-Eater* are green above, while in the other two species they are either black or chestnut.

Mr. Caley informs us, that the specimens in the Society's collection were brought to him dead: he never had an opportunity of seeing the bird in its living state. He was told that it was a bird of passage, and bred near the conflux of the Grose with the Hawkesbury River. Its nest was said to be in the

* *Gen. Syn. Supp.* ii. p. 155. no. 16. † Vol. iv. p. 130. no. 9.

‡ The bird which Mr. Lewin has figured in his "*Birds of New Holland*" (pl. 2.), and which he has referred to Dr. Latham's *Merops ornatus*, seems rather to belong to our species.

sandy banks of the river. To one of the specimens* the following note is appended. "*Iris* narrow, crimson: male.—*Oct.* 1804."

Tribus. DENTIROSTRES. *Cuv.*

Fam. LANIADÆ.

Subfam. DICRURINA. *Swains.*

On proceeding to the *Dentirostral* Tribe of the Perching Birds, and commencing with the family of *Laniadæ* which forms part of the typical group of that tribe, we find representatives of most of the greater subdivisions of the family among the Australian birds. One subdivision alone is wanting, the subfamily of *Tyrannina*, Swains. That group, or at least the typical species of it, appears confined to the New World. The present subfamily of *Dicrurina* seems, on the other hand, to belong exclusively to the Old World; and specimens of two of its most prominent groups, the genera *Artamus* and *Dicrurus*, are in our collection. There appears, however, some difference in the geographical distribution of these two forms: the species of *Artamus* being chiefly inhabitants of the islands in the Southern Ocean, while those of *Dicrurus* extend their *habitats* from the continents of Africa and India to the neighbouring islands.

ARTAMUS. *Vieill.* (Ocypterus. *Cuv.*)

1. ALBOVITTATUS. *Art. fuscatus alis ardesiacis, remigibus tribus penè extimis externè albo-marginatis, rectricibus nigris, mediis exceptis, apice albis.*

Ocypterus albovittatus. *Valenciennes, Mém. du Mus. d'Hist. Nat. tom.* vi. *p.* 23. *no.* 3.

The bills of this bird, and we believe of all the species of the present genus, are of a bluish or lead colour at their base, with a black *apex*. This species has hence attained the name of *Blue-*

* No. 106, in Mr. Caley's Catalogue.

bill

bill among the colonists. It is also called *Wood Swallow*, as we find in Mr. Caley's notes. That gentleman further adds:—"I have occasionally seen as many of these birds flying about in some places as I ever did *Swallows*, which they closely imitate in their mode of flight. This occurred where the ground had been cleared and abandoned. Their resting places were on the stumps of trees which had been felled. I do not think them migratory: if they are so, they depart for no great length of time."—A specimen in the collection was obtained by Mr. Brown at King George's Sound.

2. Cinereus. *Art. supernè canus subtus albidus; fasciâ frontali gularique, uropygio, crisso, caudâque atris, hâc apice albo.*

Ocypterus cinereus. *Valenciennes, Mém. du Mus. d'Hist. Nat. tom.* vi. *p.* 22. *no.* 2.

All the specimens of this species in the collection were procured by Mr. Brown at Broad Sound, September 1802.

Genus. Dicrurus. *Vieill.* (Edolius. *Cuv.*)

1. Balicassius. *D. virescenti-ater, rectricibus primis extrorsùm inclinantibus.*

Corvus balicassius. *Linn. Syst. Nat.* i. 157.
Monedula Philippensis. *Briss. Orn.* ii. *p.* 31. *no.* 9. *pl.* 2. *f.* 1.
Le Choucas des Philippines. *Pl. Enl.* 603.
Le Drongup. *Le Vaill. Ois. d'Afr. pl.* 173.

We consider our bird to be the same as the species above referred to, with which it agrees in its most essential particulars, although it does not exhibit the green metallic lustre which is described as alternating with the black of that species. The bird in the Society's collection may be a young bird or a female, and thus may not show the same splendour in its colours. The spe-

cies is described as very generally diffused over the East, being found in the Philippine Islands and various parts of India.

Subfam. LANIANA. *Swains.*

Genus. FALCUNCULUS. *Vieill.*

1. FRONTATUS. *Falc. cristatus fuscus, subtus flavus, capite colloque nigris, lateribus vittis duabus albis.* Lath.

Lanius Frontatus. *Lath. Ind. Orn. p.* xviii. *no.* 8.

Frontal Shrike. *Id. Gen. Hist.* ii. *p.* 72. *no.* 86. *pl.* xx.

Pie-grièche à casque. *Temm. Pl. Col.* 77.

2. GUTTURALIS. *Falc. fusco-brunneus, subtus pallidior, fronte gulâque albis, cristâ erectâ guttureque nigris, crisso fulvo.*

Capitis plumæ frontales albæ, proximæ nigræ, fasciam nigram formantes; cristales nigræ, basi griseæ; occipitales nuchalesque subgrisescentes. *Tectrices* inferiores, *remiges*que subtus basi albescentes. *Rostrum* nigrum, mandibulæ superioris apice pallido. Longitudo *corporis*, $7\frac{3}{10}$; *alæ* a carpo ad remigem quartam, $4\frac{1}{5}$; *caudæ*, $3\frac{1}{10}$; *rostri* ad frontem, $\frac{3}{5}$, ad rictum, $\frac{2}{10}$; *tarsi*, $1\frac{3}{20}$.

The specimen of this species in the Society's collection is in very indifferent condition, and the upper mandible has unfortunately been mutilated. We cannot therefore refer it with certainty to the present genus. From what we can judge however of the bill, it accords with that of the type of *Falcunculus*, with the exception of the notch being less strongly marked. In the characters of the wings, tail, and *tarsi*, it agrees very accurately with the present genus.

This bird was presented to the Society by Mr. Brown, and was procured by that gentleman at Kent's Group, December 1803.

Subfam.

Subfam. THAMNOPHILINA. *Swains.*

Genus. VANGA. *Vieill.*

1. DESTRUCTOR. *V. suprà cinereo-fuscus, subtus albidus; capite, genis, remigibus, rectricibusque nigris, illis albo-strigatis, his apice albo-marginatis.*

Vanga Destructor. *Temm. Man. d'Ornith. p.* lix.
Cassican Destructeur. *Id. Pl. Col.* 273.

Mr. Caley thus observes on this species. "*Butcher-bird.*—This bird used frequently to come into some *green wattle-trees* near my house, and in wet weather was very noisy; from which circumstance it obtained the name of *Rain-bird.* It appeared to be a solitary bird, or at least to associate only with its mate."

Genus. COLLURICINCLA*.

Rostrum forte, sub-elongatum, compressum, rectum, *culmine* apicem versus gradatim arcuato: *mandibulâ* inferiori prope apicem fortiter emarginatâ: *naribus* ovalibus subobliquis, membrano partim clausis, setis plumulisque obtectis: *rictu* setis parcè instructis.

Alæ mediocres rotundatæ: *remigibus*, primâ brevi, tertiâ quartâ quintâ et sextâ ferè æqualibus longissimis, septimâ breviori, secundâ et octavâ paulò brevioribus æqualibus; tertiæ ad sextam inclusam pogoniis externis in medio paulatim latioribus.

Pedes mediocres, fubfortes; *acrotarsiis* scutellatis, *paratarsiis* integris; *digitis* mediocribus, medio longiori, *halluce* forti, hujus *ungue* subelongato forti.

Cauda subelongata, æqualis.

* *Κολλυριων lanius*, and *κιγκλος turdus*.

This

This group, which by its straight and rather lengthened bill appears to come into the subfamily of *Thamnophilina* among the *Shrikes*, may probably be considered the representative in Australia of the South American *Thamnophili* and the African *Malaconoti*. From both those genera it differs in its entirely even tail; in its wings being comparatively longer, although rounded as in those genera; and in the *paratarsia* being entire instead of being furnished with either large but distant, or small but numerous, scales. We have been enabled to ascertain nothing of the habits of the group: but its general appearance points out the situation we at present assign it; while at the same time it has also some general resemblance to the neighbouring family of the *Thrushes*. The present subfamily, it is to be observed, is that which connects the *Laniadæ* with the last-mentioned family *Merulidæ*: and this approaching conformity to the *Thrushes* in the birds which compose the extreme and connecting group of the *Shrikes* is therefore to be expected. We have assigned the genus a name indicative of these approaching affinities.

1. CINEREA. *Coll. suprà cinerea, subtus pallidior, gulâ regioneque anteoculari albidis, remigibus internè fuscis.*
Fœm. *Subtus cinerescens, gulâ nigro-striatâ, rostro flavescente.*

Dorsum brunnescens. *Ptila* inferiora albida; *pteromata* inferiora cana fusco-variegata. *Rostrum pedes*que nigri. Longitudo *corporis*, $8\frac{2}{5}$; *alæ* a carpo ad remigem quintam, $4\frac{9}{10}$; *caudæ*, $4\frac{1}{4}$; *rostri* ad frontem, $\frac{7}{10}$, ad rictum, $1\frac{1}{20}$; *tarsi*, $\frac{9}{10}$.

Mr. Caley has noted these two birds as sexes of the same species. He adds, that they frequented at times the neighbourhood of his house, and were found in the *green wattle-trees*. The eyes he described as black. The weight of the male was $2\frac{1}{4}$ ounces.

Genus.

Genus. SPHECOTHERES. *Vieill.*

1. VIRIDIS. *Sphec. olivaceo-viridis; gulâ pectore nuchâque cineraceis; capite, genis, alulâ, pteromatibus, remigibus, rectricibusque nigris; his, quatuor mediis exceptis, apice albis.*

Sphecotheres viridis. *Vieill. Anal. d'une Nouv. Orn. pp.* 42 & 68.
Graucalus viridis. *Quoy et Gaimard, Voy. aut. du Monde, pl.* 21.
Sphecothere vert. *Vieill. Gal. des Ois. p.* 238. *pl.* 147.

M. Vieillot ranks this genus among or near the *Thrushes*. Its strong bill, however, inclines us to give it a station among the *Shrikes;* but at that extremity of the family which approaches the *Thrushes*. We do not see in this bird any of the leading characters of *Graucalus* Cuv., in which genus MM. Quoy and Gaimard have placed it. In particular, it wants those sharp and pointed feathers on the back which distinguish the birds of that group. In its habits perhaps, which those naturalists had the best opportunity of observing, it may approach *Graucalus*, and thus indicate the affinity which unites the present subfamily to the succeeding, of which that genus makes a part. Our specimen was presented to the Society by Mr. Brown, who met with the species in Keppel Bay, August 11th and October 21st, 1802. It differs from M. Vieillot's figure in having the back part of the neck cinereous instead of green, and the ends of the lateral tail-feathers white. Our bird may probably be the male. If it should prove to be a distinct species, it may appropriately receive the specific name of *Vieilloti* after the founder of the genus.

Subfam. CAMPEPHAGINA. *Swains.*

Genus. CAMPEPHAGA. *Vieill.* (Ceblepyris. *Cuv.*)

1. LEUCOMELA. *Camp. suprà nigra, subtus alba nigro-fasciata; gulâ, pteromatum et rectricum apicibus, remigumque marginibus exterioribus albis, crisso fulvo.*

Corpus

Corpus subtus fasciis gracilibus nigris undulatum. *Tectrices* inferiores albæ. *Rostrum pedes*que nigri.

The specimen of this bird in the Society's collection is in such indifferent condition that we cannot enter further into the details of its characters than the above few remarks. The tail is particularly defective; and we can determine little respecting the proportions of the species, but that the body from the apex of the bill to the root of the tail is $3\frac{1}{2}$ inches in length. The bird was found by Mr. Brown at Broad Sound, October 26th, 1802.

Genus. GRAUCALUS. *Cuv.*

1. MELANOPS. *Grauc. cinereus, fronte gutture remigibus rectricibusque, mediis exceptis, nigris, harum apicibus crissoque albis.*

Corvus melanops. *Lath. Ind. Orn. Supp. p.* xxiv. *no.* 1.
Ceblepyris melanops. *Temm. Manuel. p.* lxii.
Rollier à masque noir. *Le Vaill. Ois. de Paradis, &c. pl.* 30.

Mr. Caley says of this bird, that it may generally be seen on the tops of high dead trees. He does not consider it migratory. One of his specimens is marked "*male*," and a second "*female*."

2. PAPUENSIS. *Grauc. cinereus, gutture pectore abdomineque albis graciliter fusco transversim undulatis; strigâ latâ per oculos, pteromatibus remigibus rectricibusque nigris, harum apice albis.*

Corvus Papuensis. *Gmel.* i. 371.
Choucari de la Nouvelle Guinée. *Pl. Enl.* 630.
Papuan Crow. *Lath. Gen. Hist.* iii. *p.* 45. *no.* 42.

M. Temminck unites these two last birds as different sexes of the same species: the latter being the female. We know not upon what authority he has founded this opinion. We must however observe,

serve, that the only specimen of the *G. Papuensis* in the Linnean collection, collected by Mr. Caley, is marked by that gentleman as a male; while a specimen of the *G. melanops* is noted as a female. Time will clear away the difficulties that attend such points. At present we can only state the doubts which exist on the subject.

3. MENTALIS. *Grauc. fuscescenti-cinereus, subtus pallidior; tæniâ gracili frontali per oculos extendente, maculis gularibus, remigibus, rectricibusque nigris; mento, crisso, rectricumque apicibus albis.*

Regio parotica nigra. *Gula* summumque *pectus* nigro-sparsæ. *Remiges* internè ad basin albæ, externè graciliter albo-marginatæ. *Tectrices* inferiores albæ. *Rectrices*, mediis exceptis, internè graciliter albo-marginatæ, apicibus albo-fasciatis, externarum fasciis gradatim latioribus. *Rostrum pedes*que fusco-nigri. Longitudo *corporis*, $9\frac{1}{2}$; *alæ* a carpo ad remigem quartam, $6\frac{1}{5}$; *rostri*, $\frac{9}{10}$; *caudæ*, 5; *tarsi*, $\frac{9}{10}$.

The bird described above exhibits so many points of distinction from the preceding species, that we have ranked it as separate. Its locality also, which is different from that of the other species, serves to strengthen us in this opinion. The chief difference consists in the inferior size of our bird, all the specimens we have seen of the former species being about thirteen inches in length; in the darkness of the ash-colour on the back; in the narrowness of the frontal band, and particularly in the white colour of the *mentum*. There is, however, much variation, as is alleged, in the *Grauc. melanops* and *Papuensis*; and it may happen that our bird is but the young of one of those species.—Our specimen was found on the South Coast by Mr. Brown in 1803.

Fam. MERULIDÆ.

Subfam. MYIOTHERINA. *Swains.*

Genus. PITTA. *Vieill.*

1. BRACHYURA. *Pit. viridis, subtus ferrugineo-fulva; tæniâ superciliari pallidè fulvâ; capite, pteromatibus, remigibus, caudâque ad apicem ferè, nigris; gulâ maculâque alarum albis; ptilis uropygioque cæruleis, maculâ mediâ abdominali crissoque coccineis.*

Corvus brachyurus, *var.* ? *Lath. Ind. Orn. p.* 166. *no.* 43.
Short-tailed Crow, *var.* F? *Id. Gen. Hist.* iii. *p.* 68. *no.* 71.

We have great doubts whether this bird and all the other varieties, described by Dr. Latham as belonging to this species, are varieties only. We have not, however, sufficient grounds to make any decided observations on the subject.

Subfam. MERULINA.

Genus. TURDUS. *Linn. et Auct.*

1. VARIUS. *T. castaneo-testaceus, pennis apice perfuscis, remigibus fuscis externè castaneo-testaceis, abdomine albido, lateribus castaneo et nigro variis, rectricibus subtus fuscescentibus, crisso albido nigroque tenuiter fasciato.* Horsf. in Linn. Trans. vol. xiii. p. 149.

Turdus varius. *Horsf. Zool. Researches in Java.*

In the general characters of the bill, wings and legs, and in the disposition of its colours, this species accords sufficiently well with the European group of the genuine *Turdus* to authorize us to refer it to that genus. We must however observe, that in the few specimens which we have seen of the bird, the under mandible is considerably shorter than the upper. Whether this

this inequality is owing to the manner in which the skins have been prepared, or whether it is natural, is not for us to determine. The present individual is the only specimen Mr. Caley ever met with: it was much shattered by the contents of his gun.

Subfam. Cossyphina.

Genus. Cinclosoma*.

Rostrum subgracile, subrectum; *culmine* rotundato, apice gradatim leviterque arcuato; *mandibulâ* superiori apice emarginatâ: *naribus* basalibus, linearibus, membranâ partim tectis, setis parcè opertis; *rictu* parcè setis instructo.

Alæ breves, rotundatæ; *remige* primâ brevi, tertiâ quartâ et quintâ ferè æqualibus longissimis, secundâ et sextâ breviori-bus; tertiæ quartæ et quintæ pogoniis externis prope medium emarginatis.

Pedes subelongati, fortes; *acrotarsiis* scutellatis, *paratarsiis* integris; *digitis* mediocribus, *halluce* subforti, *ungue* subelongato, subforti.

Cauda elongata, gradata.

The birds of this genus appear to belong to that subdivision of the *Thrushes*, which by the weaker conformation of the bill opens a passage to the slender-billed *Warblers*. They deviate very considerably from the typical form of the *Merulidæ*. Besides the more gracile shape of the bill, the *nares* may be observed to be linear and longitudinal, instead of being rounded, as in the true *Turdi*. The wings are short and rounded, the first quill-feather being of moderate length, and the next gradually increasing; they thus differ from the wings of *Turdus*, where the four quill-feathers succeeding the first are nearly of equal length,

* *Κιγκλος turdus*, and *σωμα corpus*.

and the first almost spurious. The tail is long and graduated, which in the true *Thrushes* is even; and the scales on the *acrotarsia* are strongly conspicuous, while the *tarsi* of the *Thrushes* are entire.

The genus appears very nearly allied to *Timalia*, Horsf., in its general conformation. But it does not possess the elevated *culmen* of the bill so conspicuous in that group; nor is the disposition of the quill-feathers the same. In these respects *Timalia* comes nearer to *Turdus*, Auct. The *tarsi* of our genus appear somewhat more elevated than is usual in this family; and from what Mr. Caley says of the habits of the birds which compose the type of the group, we conjecture that they indicate the approach of the present subfamily to the *Rock* and *Ground Thrushes*, which form the next succeeding divisions of the extensive group of *Merulidæ*.

1. PUNCTATUM. *Cinc. supra fusco-brunneum fusco-nigro strigatum; tæniâ superciliari, maculâ utrinque longitudinali gutturali, punctis tectricum, apicibus rectricum, abdomineque medio, albis; gulâ, juguli medio, maculis pectoralibus lateralibus crissique nitescenti-nigris; pectore griseo.*

Fœm. *Gulâ maculisque gutturalibus ferrugineo-luteis.*

Turdus punctatus. *Lath. Ind. Orn. Supp. p.* xliv. *no.* 23.

Punctated Thrush. *Id. Gen. Hist.* v. *p.* 130. *no.* 169.

Mr. Caley says, that the weight of the male was 4 ounces. He adds: "This species is by no means plentifully to be met with. It inhabits the small forest scrubs, and is frequently started from the ground. It appears to be more constantly on the ground than in the trees, taking a short flight on being disturbed, and then again alighting on the ground a little further off."

Fam. Sylviadæ.

Genus. Malurus. *Vieill.*

* Rectricibus haud decompositis.

1. Cyaneus. *Mal. capite tæniâ suboculari lunulâque subnuchali sericeo-cæruleis; strigâ ante poneque oculos nuchâ gutture pectore dorsoque sericeo-nigris, abdomine albo, remigibus rectricibusque brunnescenti-fuscis, caudâ rotundatâ.*

Fœm. *Suprà fuscescenti-brunnea, subtus albida, caudâ subrotundatâ.*

Motacilla cyanea. *Gmel.* i. 991. *no.* 165.

Sylvia cyanea. *Lath. Ind. Orn. p.* 545. *no.* 142.

Superb Warbler. *Phillips's Bot. Bay, pl. at p.* 157, ♂. *p.* 159, ♀. *White's Journ. pl. at p.* 256. *fig. sup. Lath. Gen. Hist.* vii. *p.* 117. *no.* 128. *pl.* 106.

In Mr. Caley's notes we find the following observations on this species:—"These birds, at least the brown ones, were very common about Paramatta, particularly in my garden, where they came frequently hopping about in the hedges, or among the pea-sticks: but I think I may safely say that there was not one blue one amongst a hundred of them. They are gregarious and polygamous to appearance, unless I have been deceived by the young birds possessing the plumage of the female. They are very good songsters, and I may say almost the only ones in the colony.—The *irides* are black.

2. Lamberti. *Mal. capite strigâ subauriculari ad nucham extendente dorsoque medio sericeo-cæruleis; gulâ gutture pectore nuchâ dorso inferiori uropygioque sericeo-nigris, scapularibus rufo-brunneis, abdomine albo, remigibus rectricibusque brunnescenti-fuscis, caudâ gradatâ.*

Fœm. *Brunnescenti-fusca, subtus albida, caudâ subgradatâ.*

Capitis

*Capitis dorsi*que color cæruleus saturatior quàm in *Mal. cyaneo*, *occipitis* in brunneum vergens. *Tectrices* inferiores albidæ. *Rectrices* brunnescenti-fuscæ, cæruleo-nitentes. *Rostrum* nigrum. *Pedes* flavescentes. Longitudo *corporis*, $5\frac{1}{2}$; *alæ* a carpo ad remigem quartam, $1\frac{4}{5}$; *caudæ*, $3\frac{1}{5}$; *rostri* ad frontem, $\frac{7}{20}$, ad rictum, $\frac{9}{20}$; *tarsi*, $\frac{9}{10}$.

Superb Warbler, *var.* *White's Journ. pl. at p.* 256. *fig. inf.*

In honorem AYLMER BOURKE LAMBERT, *Armigeri, Societatis Linneanæ* PRO-PRÆSIDIS, *&c. Botanici eximii, Zoologiæque præsertim studiosissimi, hæc avis superba nomen accipiat.*

These two last birds have long been considered varieties of the same species, and have been figured as such in *White's Journal*. Independently, however, of the difference between the two birds in their colours, and in the distribution of them, we may observe, that the tail of the latter bird is much more graduated than that of *Mal. cyaneus*; while the under wing-coverts are whitish, which in *Mal. cyaneus* are rufous.

3. LEUCOPTERUS. *Mal. capite cristato corporeque intensè azureis, scapularibus alarumque tectricibus fuscis, his azureo-nitentibus.*

Malurus leucopterus. *Quoy et Gaimard, Voy. autour du Monde, pl.* 23. *f.* 1.

This beautiful bird was presented to the Society by Mr. Brown, who met with it on the South coast of New Holland.

4. MELANOCEPHALUS. *Mal. capite collo anticopectoreque brunnescenti-nigris, dorso coccineo, remigibus rectricibusque brunneis, abdomine albescente.*

Muscicapa melanocephala. *Lath. Ind. Orn. Supp. p.* lii. *no.* 16.

Orange-rumped Warbler. *Id. Gen. Hist.* vii. *p.* 124. *no.* 137.

5. BROWNII.

5. Brownii. *Mal. capite subcristato collo antico tectricibus alarum rectricibusque nigris, dorso coccineo, remigibus fusco-brunneis.*

Tectrices suprà nigræ, inferiores fulvescentes. *Remiges* fusco-brunneæ subtus pallidiores. *Rostrum* nigrum. *Pedes* flavescentes. Longitudo *corporis*, $3\frac{7}{10}$; *alæ* a carpo ad remigem quartam, $1\frac{3}{5}$; *caudæ*, $1\frac{4}{5}$; *rostri*, $\frac{2}{5}$; *tarsi*, $\frac{3}{4}$.

In honorem Roberti Brown, *Armigeri, Societatum Regiæ et Linneanæ Socii, &c. Botanicorum principis, qui Museum Linneanum avibus Novæ Hollandiæ propriis pretiosissimis ditavit, hæc species perpulchra nominatur.*

This species is very nearly allied to *M. melanocephalus* in the general disposition of the colours. It differs, however, in the black being more intense, and covering the whole of the under parts, the tail being darker, and the size of the bird much smaller. The bill also is black, which is of a pale-yellowish colour in the preceding species. It is marked by Mr. Brown, to whom the Society is indebted for the specimen, as having been obtained at the Bay of Inlets, near the inner entrance of Thirsty Sound, Sept. 1802.

6. Exilis. Lath. MSS. *Mal. supernè rufo-brunneus, strigis latis fuscis ornatus, subtus pallidior; remigibus rectricibusque fuscis, his apice albido.*

*Capitis dorsi*que plumæ in medio fuscæ. *Tectrices* inferiores rufescenti-albidæ. *Rectrices* fuscæ, prope apicem albidum saturatiores, brunneo-rufo marginatæ; subtus grisescentes, maculâ nigrâ prope apicem albidum instructæ. *Rostrum pedes*que flavescentes. *Irides* avellaneæ. Longitudo *corporis*, 4; *alæ* a carpo ad remigem quartam, $1\frac{7}{10}$; *caudæ*, $1\frac{7}{10}$: *rostri*, $\frac{1}{2}$; *tarsi*, $\frac{4}{5}$. Longitudo *corporis* Fœminæ, $3\frac{7}{10}$.

Exile Warbler. *Lath. Gen. Hist.* vii. *p.* 136. *no.* 165.

** Rec-

** Rectricibus decompositis.

7. MALACHURUS. *Mal. ferrugineo-brunneus, fusco-strigatus, subtus pallidior, strigâ ante oculos superciliisque pallidè cæruleis, gulâ guttureque griseis, rectricibus decompositis.*
Fœm. *Gulâ guttureque ferrugineis.*
Muscicapa malachura. *Lath. Ind. Orn. Supp. p.* lii. *no.* 15.
Soft-tailed Flycatcher. *Linn. Trans.* iv. *p.* 242. *pl.* 21.

"This bird," Mr. Caley observes; "is called *Emu Bird* by the colonists. The native name is *Wawguljelly*. I have never known it called *Merion Binnion*, as published in the Linnean Society's Transactions. The native name of an *Emu* is *Murring*. The species is an inhabitant of scrubs, which are principally composed of different kinds of *Banksia*, particularly where the ground is moist or inclining to be marshy. The natives tell me it may be run down.—It has a small shining black eye, with a hazel-brown *iris*."

Genus. ACANTHIZA*.

Rostrum gracile, breve, rectum, basi subdepressum, apice compressum, *culmine* apicem versus leviter arcuato; *mandibulâ* superiori subemarginatâ; *naribus* linearibus, longitudinalibus, supra membranâ tectis, setis plumulisque partim opertis; *rictu* setis parcè instructo.
Alæ subbreves, rotundatæ; *remige* primâ brevi, secundâ et tertiâ gradatim longioribus, quartâ longissimâ, secundâ et decimâ æqualibus.
Pedes graciles, *acrotarsiis paratarsiis*que integris.
Cauda mediocris, apice subrotundata.

This group is closely connected with that of *Malurus*. The construction of the wings and legs is the same, and their habits, as far as we can learn, are similar. But the soft, lengthened,

* *Ακανθεων dumetum*, and *ζαω vivo*.

and

ZOOLOGICAL SOCIETY.

THIS SOCIETY was instituted in 1826, under the auspices of Sir T. Stamford Raffles, Sir Humphry Davy, Bart., and other eminent individuals, for the advancement of Zoology, and the introduction and exhibition of subjects of the Animal Kingdom, alive or in a state of preservation.

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N. A. VIGORS,

BRUTON-STREET,
March 7th, 1827.

SECRETARY.

Dr Edmund Clark

3 Hyde Park Place West.

and graduated tail, which gives a striking character to the typical species of *Malurus*, is wanting in the present group, in which the tail is short and rounded; in some species, indeed, inclining to become even. Both groups have a bill which partakes of the character of that of the *Muscicapidæ*, and which has caused some species among them to be referred to that family. But the bill of our group is rather more depressed at the base, is shorter and less arcuated than that of *Malurus*. In all these points, however, the two groups approach each other so nearly in some of the extreme species, that it is difficult to draw the line of distinction between them. As in all similar cases of groups thus approximating to each other, we fix our attention on the typical species chiefly of each, which in the present instance may be considered to be *Malurus Lamberti* and *Acanthiza pusilla*.

In reference to the European groups of this family, these two forms of the New Holland *Warblers* appear to approach them more nearly than any other extra-European species. The wings are formed upon the same model, the first quill-feather being short, although not so much so as in the typical species of Europe. The integrity of the *tarsi*, however, the uneven tail, and the *rictus* of the bill partially beset with bristles, and approximating to that of the *Flycatchers*, sufficiently point out a distinction. Of all the European *Sylviadæ*, they resemble most nearly the group of *Regulus*, Cuv.: they want, however, the singular plume which covers the nostrils of that genus. The species which we have met with possess a general similarity in the disposition of their colours; and they appear to be distinguished by the character of having the webs of their feathers, particularly about the head and neck, more than usually loose and decomposed. Like the *Reguli* they appear to be the inhabitants of bushes and low scrubs.

1. NANA. *Acant. viridescenti-olivacea, subtus flava, fronte genisque albescenti-flavis, remigibus caudâque olivaceo-fuscis, hâc prope apicem nigro-fasciatâ.*

Genarum plumarum rhaches albidæ. *Tectrices* inferiores albidæ. *Rostrum pedes*que flavescentes. Longitudo *corporis*, $3\frac{2}{5}$; *alæ* a carpo ad remigem quartam, $1\frac{9}{10}$; *caudæ*, $1\frac{3}{10}$; *rostri*, $\frac{7}{20}$; *tarsi*, $\frac{13}{20}$.

Dwarf Warbler, *var.* A? *Lath. Gen. Hist.* vii. *p.* 134. *no.* 161.

We are informed by Mr. Caley that these birds were found in the *green wattle-trees* about his house in great numbers. The *irides* are gray.

2. REGULOIDES. *Acant. suprà viridi-olivacea, subtus flavescenti-albida; fronte sincipitisque parte anteriori ferrugineo notatis, uropygio caudæque basi apiceque fulvo-luteis, hâc medio nigrâ.*

*Frontis sincipitis*que plumæ in medio ferrugineæ, apice fusco-marginatæ. *Tectrices* inferiores albidæ. *Rostrum* brunnescens, parte inferiori pallescente. *Pedes* flavescentes. *Irides* griseæ. Longitudo *corporis*, $3\frac{3}{4}$; *alæ* a carpo ad remigem quartam, 2; *caudæ*, $1\frac{1}{2}$; *rostri*, $\frac{7}{20}$; *tarsi*, $\frac{7}{10}$.

Dwarf Warbler, *var.* B? *Lath. Gen. Hist.* vii. *p.* 135. *no.* 161.

This species was met with by Mr. Caley in the same situation as the last. Some specimens also in the collection were brought home by Mr. Brown from Port Jackson, where he obtained them in August 1803.

3. FRONTALIS. *Acant. fusco-brunnea, subtus pallidior; fronte, gulâ, pectoreque albis, uropygio rufescente.*

*Remiges rectrices*que brunneo-fuscæ, subtus grisescentes. *Tectrices* inferiores albidæ. *Rostrum* pallidè fuscum, subtus flavescens. *Pedes* flavescentes. Longitudo *corporis*, $4\frac{1}{4}$; *alæ* a carpo ad remigem quartam, $2\frac{3}{10}$; *caudæ*, $1\frac{9}{10}$; *rostri*, $\frac{9}{20}$; *tarsi*, $\frac{3}{4}$. Variat corpore grandiore.

4. PYR-

4. PYRRHOPYGIA. *Acant. fusco-brunnea, subtus albida; uropygio rufo, caudâ fasciâ subapicali nigrâ, apice albido.*

Remiges pogonio interno fuscescentes, subtus fuscæ. *Rectrices*, duæ mediæ totæ fusco-brunneæ, cæteræ apice albido; subtus fusco-cinereæ, versus apicem saturatiores, apice albido. *Rostrum pedes*que flavescentes. Longitudo *corporis*, $4\frac{9}{10}$; *alæ* a carpo ad remigem quartam, $2\frac{3}{10}$; *caudæ*, $2\frac{1}{4}$; *rostri*, $\frac{1}{2}$; *tarsi*, $\frac{19}{20}$.

This species has a tail more elongated, and somewhat more graduated than the typical species of the genus. In its other external characters and in the disposition of the colours it sufficiently accords with the group. By the characters of its tail it appears to approach the *Maluri*; and with *Malurus exilis*, a species described above, it may be said to form a passage between these two closely-allied groups*.

* We take this opportunity of inserting two species of this genus, which are not in the Society's collection.

5. PUSILLA. *Acant. fusco-brunnea fronte fulvo-variegatâ, subtus albida, gutture pectoreque fusco-striatis, uropygio rufescente, rectricibus in medio fusco-fasciatis, apice pallido.*

Motacilla pusilla. *White's Journ. pl. in p.* 257.

Dwarf Warbler. *Lath. Gen. Hist.* vii. *p.* 134. *no.* 161.

In Mus. Societatis Zoologicæ.

6. BUCHANANI. *Acant. suprà olivaceo-viridis, capitis parte anteriori albo-lineato, subtus albida, gutture pectoreque fusco-lineatis; rectricibus nigris, uropygio coccineo.*

*Frontis sincipitis*que partis anterioris plumarum rhaches albæ. *Lora* alba. *Remiges* brunneo-fuscæ, subtus pallidiores. *Tectrices* inferiores albæ. *Rectrices* nigræ, exteriores pallidiores, subtus fuscescentes. *Rostrum* fuscum. *Pedes* flavescenti-fusci. Longitudo *corporis*, $4\frac{1}{10}$; *alæ* a carpo ad remigem quartam, 2; *caudæ*, $1\frac{4}{5}$; *rostri*, $\frac{2}{5}$; *tarsi*, $\frac{3}{5}$.

In Mus. Dom. Buchanan.

In honorem GUALTERI BUCHANAN, *Armigeri, Societatis Linneanæ Socii, Zoologiæ studiosissimi, hanc speciem nominavimus.*

Genus. MEGALURUS. *Horsf.*

1. CRURALIS. *Meg. pallidè murino-brunneus; maculis anteocularibus, gutturalibus, abdominalibusque fusco-brunneis; crisso fusco-striato, plumarum auricularium rhachibus albis.*

Dorsum brunneo saturatiore nebulosum. *Remiges* pallido-rufo externè marginatæ; subtus basi albidæ, ad apicem grisescentes. *Tectrices* inferiores fusco-brunneæ. *Rectrices* subtus grisescentes. *Rostrum* brunnescens. *Pedes* pallidè brunnei. *Irides* griseo-brunneæ. Longitudo *corporis*, $8\frac{1}{2}$; *alæ* a carpo ad remigem tertiam, $4\frac{2}{5}$; *caudæ*, $3\frac{17}{20}$; *rostri* ad frontem, $\frac{11}{20}$, ad rictum, $\frac{19}{20}$; *tarsi*, $1\frac{1}{2}$; *hallucis*, ungue incluso, $1\frac{1}{5}$.

"These birds," as is observed by Mr. Caley, "are birds of passage. They appear in no great numbers. They alight on the tops of dead trees. The note is loud and harsh."

2. GALACTOTES. *Meg. rufo-brunneus, fusco-brunneo strigatus, subtus albidus, rectricum rhachibus fusco-brunneis.*

Malurus Galactotes. *Temm. Pl. Col.* 65.

This bird has been placed by M. Temminck among the *Maluri*; but the strength of its formation with respect to its bill, legs, and tail, by no means accords with the characters of those birds. It belongs more properly to *Megalurus*, although not exactly agreeing with the typical species; its structure being weaker in comparison with them, as it is stronger with respect to the *Maluri*. It seems to indicate a passage between the two groups. The specimens in the collection were obtained by Mr. Brown at Broad Sound, near the upper head, October 24th, 1802.

Genus. ANTHUS. *Bechst.*

1. AUSTRALIS. *Ant. suprà rufo-brunneus, fusco-brunneo variegatus, subtus fulvo-albidus strigis fusco-brunneis; maculâ superciliari fulvâ, gulâ albâ, remigibus rectricibusque brunneo-fuscis, harum duabus exterioribus albo-marginatis.*

*Capitis dorsi scapularium tectricum*que plumæ in medio longitudinaliter fusco-notatæ. *Pectoris abdominis*que plumæ in medio brunneo graciliter strigatæ; *crissi* albescentis similiter strigatæ. *Remiges* subtus pallidiores, internè ad basin albescentes. *Tectrices* inferiores pallidè fulvæ. *Rectrices* duæ externæ albæ, pogonio interno brunneo-fusco marginatæ; primarum rhachibus ad basin albis, ad apicem brunneis; secundarum totis brunneis: duæ mediæ fulvo-marginatæ. *Rostrum* brunneo-fuscum, subtus ad basin pallescens. *Pedes* flavescentes. Longitudo *corporis*, 6; *alæ*, $3\frac{1}{2}$; *caudæ*, $2\frac{17}{20}$; *rostri*, $\frac{3}{8}$; *tarsi*, $1\frac{1}{20}$.

Mr. Caley says that "this *Lark* is very common. It may frequently be seen both in the trees and on the ground. Having met with it in the height of summer and the depth of winter, and indeed I may almost say at all times, I consider it not migratory." A specimen in the collection presented by Mr. Brown was obtained on the South Coast.

2. PALLESCENS. *Ant. suprà pallido-rufo brunneoque varius, subtus albidus, pectore brunneo parcè maculato; remigibus rectricibusque fusco-brunneis, harum duabus exterioribus albo-marginatis.*

*Capitis dorsi tectricum*que plumæ in medio fusco-brunneæ, ad margines pallidè rufæ. *Remiges* rufo-marginatæ, subtus grisescentes, internè pallidiores. *Tectrices* inferiores pallidæ.

Rectrix

Rectrix prima alba, pogonio interno brunneo-marginato; secunda alba, strigâ mediâ, rhachin includente, margineque interno brunneis. *Rostrum pedes*que flavescentes. Longitudo *corporis*, $4\frac{4}{5}$; *alæ*, 3; *caudæ*, $1\frac{9}{10}$; *tarsi*, $1\frac{1}{20}$.

3. MINIMUS. *Ant. suprà viridi-olivaceus, fusco varius, capite brunneo albido-strigato; subtus viridiscenti-albus brunneo-striatus; rectricibus, mediis exceptis, brunnescenti-nigris apice albis.*

Capitis plumæ brunneæ, strigâ mediâ albâ, rhachin includente, notatæ. *Dorsi tectricum*que plumæ in medio fuscæ, ad margines viridi-olivaceæ; *uropygii* ad viridi-flavum inclinantes. *Remiges* fuscæ, subtus pallidiores. *Tectrices* inferiores fuscæ. *Rectrices* duæ mediæ viridi-olivaceæ; cæteræ basi brunnescenti-nigræ apicem versus saturatiores, apicibus albis. *Rostrum pedes*que pallidi. Longitudo *corporis*, $3\frac{9}{10}$; *alæ* $2\frac{3}{10}$; *caudæ*, $1\frac{9}{10}$; *rostri*, $\frac{2}{5}$; *tarsi*, $\frac{3}{10}$.

4. FULIGINOSUS. *Ant. suprà viridi-olivaceus, subtus pallidior, nigro-strigatus; remigibus rectricibusque pallidè brunneis, his nigro-fasciatis apice albido.*

Corporis plumæ in medio nigro-strigatæ. *Remigum* pogonia externa pallidè marginata. *Caudæ* fascia sublata prope apicem nigra. Longitudo *corporis*, 4; *alæ*, $2\frac{1}{2}$; *caudæ*, $1\frac{7}{10}$; *rostri*, $\frac{1}{2}$; *tarsi*, 1.

This bird was procured by Mr. Brown at Van Diemen's Land in 1804.

5. RUFESCENS. *Ant. pallidè brunneus, fusco-brunneo nebulosus, subtus pallidior; gulâ albidâ, uropygio rufescente, remigibus caudâque brunnescentibus.*

Corporis superioris plumæ in medio fusco-brunneæ. *Remigum* pogonia

pogonia externa albido-marginata. *Tectrices* inferiores albidæ parcè nigro notatæ. Longitudo *corporis*, $6\frac{1}{5}$; *alæ*, $3\frac{9}{10}$; *caudæ*, $2\frac{9}{10}$; *rostri*, $\frac{7}{10}$; *tarsi*, $1\frac{1}{10}$.

The birds of the group just described which are in our collection are in general in bad condition, and we have been obliged to confine ourselves to a few details only of their characters. Even still we are not satisfied with our distinguishing marks. The last species in particular is very doubtful, and we are not quite certain that it even belongs to this genus.

Genus. Dasyornis*.

Rostrum forte, subarcuatum, *culmine* carinato, *mandibulâ* superiori vix emarginatâ; *naribus* basalibus, ovalibus, longitudinalibus, membranâ suprà partim tectis.

Alæ breves, rotundæ: *remige* primâ subbrevi, secundâ tertiâ et quartâ gradatim longioribus, quintâ sextâ et septimâ ferè æqualibus longissimis, cæteris gradatim decrescentibus.

Cauda elongata, gradata.

Pedes subfortes, mediocres; *halluce* forti, *ungue* subelongato, arcuato; *acrotarsiis* scutellatis, *paratarsiis* integris.

Regio anteocularis vibrissis recumbentibus fortibus instructa.

Corporis plumarum pogonia decomposita.

This genus bears a very close resemblance to the group of *Timalia* of the Javanese ornithology. In the shortness and roundness of the wings, in the length and graduation of the tail, in the carinated bill, and in the loose and decomposed feathers of the body, it comes so close to that group that we should at once refer our species to it, were it not for the singular bristles that spring from the front of the forehead above the bill, and form

* *Δασυς hirsutus*, and *ορνις avis*.

a strongly

a strongly distinguishing character. The *Motacilla Africana*, Gmel., *Le Fluteur* of M. Le Vaillant, belongs to this group. In that bird the frontal bristles are not so long as as in our bird, but they are more numerous, and equally strong. We do not feel quite satisfied as to the situation of the group. We have some grounds for thinking that with *Timalia* it may rather be referred to that place among the *Thrushes* where the species gradually pass into the *Warblers*, than to the present situation. At the same time, it shows some resemblance to *Megalurus*, Horsf., and perhaps to *Malurus*, Vieill.; in which last genus M. Temminck would decidedly place it according to the mode in which he has undertaken to enlarge that group. We wait for further knowledge of the habits of the species to enable us to determine this point.

1. AUSTRALIS. *Das. suprà fusco-brunneus, subtus pallidior; jugulo abdomineque medio albido, remigibus rectricibusque rufo-brunneis.*

*Remiges rectrices*que subtus fuscescentes. *Tectrices* inferiores fusco-brunneæ. *Rostrum pedes*que pallidi. Longitudo *corporis*, $7\frac{1}{2}$; *alæ* a carpo ad remigem sextam, $2\frac{9}{10}$; *caudæ*, $3\frac{4}{5}$; *rostri* ad frontem, $\frac{11}{20}$, ad rictum, $\frac{3}{4}$; *tarsi*, $\frac{9}{10}$.

This bird Mr. Caley procured in a scrubby place on the north side of Paramatta. He was able to ascertain nothing of its habits. He calls it in his notes "*Bristle Bird.*"

Genus. GRALLINA. *Vieill.*

1. MELANOLEUCA. *Grall. nigra; fronte, gulâ, strigâ postoculari, torque nuchali, abdomine, strigâ latâ longitudinali alarum, uropygio, remigum secundariarum apicibus, caudæque basi et apice albis.*

Grallina

Grallina melanoleuca. *Vieill. Anal. d'une Nouvelle Orn. pp.* 42. *&* 68.

La Gralline noire et blanche. *Id. Gal. des Ois. pl.* 150.

We feel much uncertainty respecting the natural station of this genus of M. Vieillot. That gentleman places it in the same division with the *Thrushes*, next to his genus *Psaroidos* (*Pastor*, Temm.); and from the size of the typical species and its general appearance, such a situation may be assigned it with much probability of being near the truth. Our specimens, both of this species and of the next, which seems to belong to the same group, are not in sufficiently good condition to enable us to come to any decided opinion on this point. But as far as we can judge from the general characters of the bird before us, it strikes us that it bears a very great resemblance to the group of *Enicurus*, Temm., which belongs to the neighbouring Island of Java, and which is closely allied to the true *Motacilla* or the *Wagtails* of Authors. The length of the legs, the depression of the bill, and the general disposition of the colours, afford us some grounds for such a supposition. We leave it in this place provisionally for the present, until more perfect specimens are before us, and some knowledge of the habits and anatomy of the birds points out with certainty their station in nature.

Our specimen was procured by Mr. Brown at Port Jackson in 1802.

2. Bicolor. *Gral. nigra, dorso albo-variegato; scapularibus, strigâ humerali, fasciâ mediâ alarum, abdomine caudæque basi albis.*

*Caput collum*que intensè nigra, colore nigro in medium pectus angulariter descendente. *Remiges* suprà nigræ, subtus pallidè fuscæ; tertiæ ad sextam inclusam pogonia interna, cæterarum, duabus intimis exceptis, pogonia utrinque fas-

ciâ albâ instructa, fasciam albam elongatam, alis patentibus, exhibentia: secundariarum margines et apices albo-notati. *Tectrices* inferiores albæ, nigro variegatæ. *Rectrices* duæ mediæ totæ nigræ; quinta ad basin externè alba; cæteræ ad basin utrinque albæ, ad apicem fasciâ pergracili albâ marginatæ. *Rostrum* nigrum. *Pedes* pallidè fuscæ. Longitudo *corporis*, $5\frac{13}{20}$; *alæ* a carpo ad remigem quartam, $3\frac{19}{20}$; *caudæ*, $3\frac{1}{10}$; *rostri* ad frontem, $\frac{1}{2}$, ad rictum, $\frac{7}{10}$; *tarsi*, 1.

This species resembles the preceding in its general characters, and in the disposition of its colours. It differs much in size. But from its accordance in more material points we do not hesitate to refer it to the same group.

The specimen in the collection was met with by Mr. Brown near Prospect Hill.

Genus. ZOSTEROPS*.

Rostrum mediocre, gracile, arcuatum; *mandibulâ* superiore vix emarginatâ; *naribus* basalibus, linearibus, longitudinalibus, membranâ suprà tectis, *rictu* inermi.

Alæ mediocres; *remigibus* primâ et quintâ ferè æqualibus, secundâ tertiâ et quartâ paulò longioribus, ferè æqualibus, primariis secundarias paululum longitudine superantibus.

Pedes subfortes, subelongati; *acrotarsiis* scutellatis.

Cauda æqualis.

Caput gracile, concinnum; plumulis periopthalmicis subsericeis albis cingulum subprominentem efformantibus.

The true *Sylvia*, if we select the slenderly-formed *Warblers* of Europe, such as the *Motacillæ hippolais*, *trochilus*, *&c.* Linn., as the types of the genus, are set apart from almost all the other species of the family by the formation of their wing, in which the first quill-feather is extremely short, in some instances, indeed,

* Ζωστηρ *cingulum*, and οψ *oculus*.

deed, almost spurious. Of the foreign groups of the family we have already observed that the New Holland genera *Malurus* and *Acanthiza* come nearest the European type by the same construction of the wing. The present group essentially differs from it. The first quill-feather is long, almost equal to the second, which together with the third and fourth,—all of them nearly of a length,—are the longest. The *nares* also are linear and longitudinal, thus differing from the oval form of the European type. In other respects the characters of these two groups have a general accordance. Besides the disposition of the wing-feathers, we may also mention the scutellation of the *tarsi*, the even tail, and the unarmed *rictus*, as additional marks of distinction from the before-mentioned New Holland *Sylviadæ*. From the genus *Hylophilus* of M. Temminck, which has lately been separated with much judgement from the *Sylvia* of Dr. Latham, and which also has the first quill-feather elongated and nearly even with the rest, our present group may readily be distinguished by a much more gracile and arcuated bill, in which the *nares* also are of a different construction. The *Motacilla Maderaspatana* of Linnæus, (*Sylvia Madagascariensis*, Lath.), belongs to our group, which seems to have a very wide dispersion.

1. Dorsalis. *Zost. flavescenti-viridis, dorso cinereo, strigâ ante subtusque oculos nigrâ; subtus flavescenti-albidus, gutture pallidè flavo, abdominis lateribus ferrugineo tinctis.*

*Remiges rectrices*que fuscæ, flavescenti-olivaceo marginatæ, subtus pallidiores. *Tectrices* alarum inferiores albidæ. *Orbitæ* plumulis albis vestitæ. *Rostrum pedes*que flavescenti-fusci. Longitudo *corporis*, $4\frac{3}{5}$; *alæ* a carpo ad remigem tertiam, $2\frac{3}{10}$; *caudæ*, $1\frac{9}{10}$; *rostri* ad frontem, $\frac{2}{5}$, ad rictum, $\frac{11}{20}$; *tarsi*, $\frac{3}{4}$.

Sylvia annulosa, *var.* β. *Swains. Zool. Illust. pl.* 16.

 This

This species differs from the *Motacilla Maderaspatana*, Linn., chiefly by the griseous band which covers the back, and the less extent and depth of colour of the black mark which is found before and under the eye. Mr. Caley has not noticed the habits of this bird, beyond its having built its nest in a *mulberry-tree* close to his house.

Genus. SAXICOLA*. *Bechst.*

1. SOLITARIA. *Sax. suprà fusco-brunnea, fronte, pectore, abdomineque ferrugineo-rufis; gulâ albidâ.*

Frontis plumæ pallidè ferrugineæ, *gulæ* albidæ. *Tectrices* inferiores ferrugineo-rufæ. *Remiges* internè ad basin rufescentes; subtus pallidè fuscæ. *Rectrices* suprà fusco-brunneæ, subtus brunneo-fuscæ. *Rostrum pedes*que pallidè fusci. *Irides* avellaneæ. Longitudo *corporis*, 5; *alæ* a carpo ad remigem quartam, $2\frac{3}{5}$; *caudæ*, $1\frac{1}{2}$; *rostri* ad frontem, $\frac{1}{2}$; ad rictum, $\frac{7}{10}$; *tarsi*, $\frac{17}{20}$.

* We adjoin the following description of a New Holland bird of this genus, which has been kindly sent to us by Mr. Buchanan of this Society.

2. JARDINII. *Sax. nigrescenti-grisea, abdomine albo; alis rectricibusque nigris, illis albo-fasciatis, his, mediis exceptis, fasciâ in medio latâ, ad apicem gracili, albâ notatis.*

*Caput thorax*que nigrescentes; illo griseo, hoc albo parcè sparsis: hujus color nigrescens in pectus descendit, semilunam efformans. *Ptila* grisescentia. *Remiges* prima et secunda totæ nigræ; tertia internè ad basin albo-marginata; quarta quinta et sexta internè albo marginatæ inque medio fasciatæ; cæteræ utrinque in medio albo-fasciatæ: subtus fuscæ, albo, ut supernè, notatæ. *Tectrices* inferiores albæ, nigro variegatæ. *Rectrices* quatuor externæ in medio utrinque latè albo-fasciatæ, ad apicem albo-marginatæ; quinta pogonio externo albo-fasciata; duæ mediæ totæ nigræ. *Rostrum pedes*que nigri. Longitudo *corporis*, $6\frac{4}{5}$; *alæ* a carpo ad remigem quartam, $3\frac{4}{5}$; *caudæ*, $2\frac{19}{20}$; *rostri* ad frontem, $\frac{1}{2}$, ad rictum, $\frac{3}{4}$; *tarsi*, 1.

Viri in Ornithologiâ præstantis, nobis amicissimi, GULIELMI JARDINE, *Baroneti, Societatum Regiæ Edinensis et Linneanæ Socii, hæc species nomine distinguatur.*

Motacilla

Motacilla solitaria. *Lewin, Birds of New Holland, pl.* 16.
Muscicapa solitaria. *Lath. Gen. Hist.* vi. *p.* 220. *no.* 110.

The specimens of this bird in the Society's collection are in very bad condition: but from their general characters, and the accounts we have received of their manners, we consider them as sufficiently according with M. Bechstein's group of *Saxicola*. Mr. Caley in his Notes thus observes of these birds.—"*Cataract Bird:* an inhabitant of rocky ground.—While at the Waterfall of Carrung-gurring, about thirty miles to the southward of Prospect Hill, I saw several of them. I have also seen them in the North Rocks, about a couple of miles from Paramatta: and always upon the rocks. I never observed them in trees or bushes." A specimen in the collection presented by Mr. Brown is marked as found by that gentleman at Port Jackson, September 15th, 1803.

We have some doubt as to this species according exactly with Mr. Lewin's *Motacilla solitaria*, and have therefore added a more detailed description of it than is our custom when noticing a published species.

Fam. Pipridæ.

Genus. Pardalotus*. *Vieill.*

1. Punctatus. *Pard. suprà griseus, fusco undulatus, capite alisque nigris albo punctatis, strigâ superciliosâ albâ, uropygio coccineo; subtus albidus, gutture flavo.*

* We characterize the following species, although not in the Society's collection, in order to point out the difference between it and *Pard. punctatus*, which it much resembles in general appearance.

2. Striatus. *Pard. dorso grisescenti-brunneo uropygio fulvo; capite alis caudâque nigris, illo albo-striato; strigâ superciliari ad frontem flavâ ponè albâ, pteromatibus apice coccineis, gulâ flavâ, pectore abdomineque albis, flavo parcè variegatis.*
Pipra striata. *Lath. Ind. Orn. p.* 558. *no.* 13.

Fœm.

Fœm. *Capitis punctis fulvis.*
Pipra punctata. *Lath. Ind. Orn. Supp. p.* lvi *no.* 1.
Pardalote pointillé. *Temm. Pl. Col.* 78. *Vieill. Gal. des Ois. pl.* 73.

We are informed by Mr. Caley, that "this species is called *Diamond Bird* by the settlers, from the spots on its body. By them it is reckoned a valuable bird on account of its skin. It is not very plentifully to be met with. It inhabits both forest-land and brushes; at least I have seen it in both."

Genus. PACHYCEPHALA*. *Swains. MSS.*

Rostrum forte, basi aliquantulum latum, *culmine* rotundato, arcuato; *mandibulâ* superiore emarginatâ; *naribus* basalibus, ovalibus, membranâ suprà partim tectis, plumulis setisque parcè opertis; *rictu* setis debilibus parcè hirsuto.

Alæ mediocres rotundatæ; *remige* primâ brevi, secundâ et tertiâ gradatim longioribus, quartâ et quintâ ferè æqualibus longissimis, sextâ paulò breviori, cæteris gradatim decrescentibus; tertiæ quartæ et quintæ pogoniis externis in medio paulò latioribus.

Cauda mediocris, ferè æqualis, vix furcata.

Pedes mediocres, subfortes; *acrotarsiis* scutellatis, *paratarsiis* integris.

Caput tumidiusculum.

Although we have received no account of the habits of the birds of this group, we consider the present family of *Pipridæ* to be that to which it bears the greatest affinity. The bill is formed very much on the same model as that of the Linnean *Pipra*, short, strong, rather wide at the base, and with an arched and rounded *culmen*. In their general appearance some of the

* *Παχυς crassus*, and *κεφαλη caput*.

species

species exhibit a resemblance to the birds of the genus *Procnias*, Ill., while by the puffed-out appearance of the feathers about the head, we trace also an approximation to some of the Linnean *Pari*. An approach in character may also be noticed between them and the *Muscicapæ;* among which, indeed, the typical species of the present group has been hitherto placed. The situations which we at present assign the group, in consonance with the views exhibited on the subject in a preceding volume of these Transactions*, will be found to embrace all these affinities, and to unite all the birds thus approaching each other in one conterminous assemblage.

1. Gutturalis. *Pac. flavo-olivacea; capite lunulâque pectorali nigris; jugulo albo; torque nuchali, pectore abdomine crissoque flavis.*

Turdus gutturalis. *Lath. Ind. Orn. Supp. p.* xli. *no.* 6.

Black-crowned Thrush. *Lewin, Birds of New Holl. pl.* 10.

"This species," Mr. Caley says, "is called *Thunder-bird* by the colonists. I have not often met with it, at least in perfect plumage. It frequents the *green wattle-trees* in Paramatta. The natives tell me, that, when it begins to thunder, this bird is very noisy."

2. Pectoralis. *Pac. grisea, strigâ latâ per oculos lunulâque pectorali nigris, jugulo albo; abdomine ferrugineo, pteromatibus remigibus rectricibusque fusco-nigris.*

Capitis plumæ in medio longitudinaliter fusco-striatæ; *dorsi, ptilorum*que plumæ similiter at magìs leviter striatæ. *Pteromata, remiges, rectrices*que fusco-nigræ, externè griseo-marginatæ; subtus pallidiores, basi albescentes. *Tectrices*

* Vol. xiv. p. 444.

inferiores

inferiores pallidè ferrugineæ. *Rostrum* nigrum. *Pedes* fusci. Longitudo *corporis*, $6\frac{4}{5}$; *alæ* a carpo ad remigem quartam, $3\frac{17}{20}$; *caudæ*, $3\frac{7}{20}$; *rostri* ad frontem, $\frac{1}{2}$, ad rictum, $\frac{3}{4}$; *tarsi*, $\frac{9}{10}$.

Muscicapa pectoralis. *Lath. Ind. Orn. Supp. p.* li. *no.* 11.

Orange-breasted Thrush. *Lewin, Birds of New Holl. pl.* 6.

Some confusion has existed between these two last species, which we are decidedly of opinion are distinct, although referred to one species by Dr. Latham in his lately published *General History*. The former is a common and well known species. Of the latter, we have entered into the characters in detail, as it is less usually met-with than *P. gutturalis*.

3. STRIATA. *Pac. supernè olivaceo-grisea, leviter fusco-striata, subtus albescens, striis fuscis latioribus notata, pteromatibus remigibus rectricibusque fuscis.*

Fœm. *Supernè grisea, subtus fulvo-albescens, graciliter fusco-striata; gulâ guttureque albidis.*

*Capitis dorsi*que plumæ in medio strigis fuscis leviter notatæ. *Guttur* albescens. *Remiges rectrices*que suprà fuscæ, subtus pallidiores. *Tectrices* inferiores fulvo-albidæ, leviter fusco-striatæ. *Rostrum pedes*que pallescentes. Longitudo *corporis*, $6\frac{3}{10}$; *alæ* a carpo ad remigem quartam, $3\frac{7}{10}$; *caudæ*, 3; *rostri* ad frontem, $\frac{9}{20}$, ad rictum, $\frac{7}{20}$; *tarsi*, $\frac{4}{5}$.

The inside of the mouth of these birds is noted by Mr. Caley as being yellow; the eyes are black; their weight is an ounce.

4. FUSCA. *Pac. olivaceo-fusca, subtus pallidior, gulâ abdomineque albidis, remigibus rectricibusque fuscis, istarum intimarum marginibus ferrugineis.*

Pteromatum

Pteromatum interiorum apices fulvo, exteriorum fusco, notati. *Tectrices* inferiores albescentes. *Rostrum* flavescens. *Pedes* fusci. Longitudo *corporis*, 6; *alæ* a carpo ad remigem quartam, $3\frac{1}{2}\frac{1}{0}$; *caudæ*, $3\frac{1}{1}\frac{}{0}$; *rostri* ad frontem, $\frac{4}{1}\frac{}{0}$, ad rictum, $\frac{1}{2}\frac{3}{0}$; *tarsi*, $\frac{1}{2}\frac{3}{0}$.

There are two specimens of this bird in the collection, one of which is marked by Mr. Caley as a young male, the other as a female. It is probable that the adult male may differ from both. The eyes are noted as being black. Their weight is 14 drachms.

5. Olivacea. *Pac. suprà viridi-olivacea, subtus fulvescens, capite grisescente, gutture albo notato.*

*Remiges rectrices*que fuscæ, viridi-olivaceo externè marginatæ; hæ subtus viridi-flavescentes, istæ pallidè fuscæ. *Tectrices* inferiores albidæ. *Rostrum* fuscum, mandibulâ inferiore ad basin fuscâ. *Pedes* nigri. Longitudo *corporis*, $7\frac{7}{1}\frac{}{0}$; *alæ* a carpo ad remigem quartam, $3\frac{4}{5}$; *caudæ*, $3\frac{7}{1}\frac{}{0}$; *rostri* ad frontem, $\frac{1}{2}$, ad rictum, $\frac{7}{1}\frac{}{0}$; *tarsi*, $1\frac{1}{1}\frac{}{0}$.

6. Fuliginosa. *Pac. griseo-testacea, subtus pallidior subfulvescens, gulâ albidescente.*

Rostrum nigrum. *Pedes* fusci. Longitudo *corporis*, 6: *alæ* a carpo ad remigem quartam, $3\frac{7}{1}\frac{}{0}$; *rostri*, $\frac{1}{2}\frac{8}{0}$; *tarsi*, $\frac{1}{2}\frac{9}{0}$.

Two birds of this species were presented to the Society by Mr. Brown, which he met with on the South coast of New Holland. A third bird, presented also by that gentleman, was found by him on the East coast. It varies from the other two in the upper colour being more plumbeous. This may be a distinct species; but all the specimens are in bad condition, and it is impossible to make any decision respecting them, particularly in a group where the colours are in general indistinct.

7. AUSTRALIS. *Pac. suprà cinerea, dorso infimo flavescente; subtus flava, remigibus rectricibusque fuscis.*

Muscicapa australis. *Lath. Ind. Orn. Supp. p.* 1. *no.* 2.
Southern Motacilla. *White's Voy. pl. in p.* 239.
Southern Flycatcher. *Lath. Gen. Hist.* vi. *p.* 216. *no.* 102.

"This bird," Mr. Caley says, "is called *yellow Robin* by the colonists. It is an inhabitant of brushes." A bird in the collection, which has in every respect the appearance of the present species, with the exception of the throat being whitish instead of yellow, was met with by Mr. Brown on the South coast. It is probably the young of the species.

The two last species deviate considerably in the form of their bills from the other species of this genus. Those members are much more slender and less arched at the *culmen* than in the typical birds. In other characters the two species sufficiently accord with the group. We leave them at the extremity of it for the present, not being willing to speak too decisively on a subject in which our materials are scanty and not in the best order for examination. The two species evince a very strong approximation to the *Muscicapidæ*.

Fam. MUSCICAPIDÆ.

Genus. MUSCICAPA. *Linn. et Auct.*

If we select the *Muscicapa atricapilla* of Linnæus as the type of the extensive family of *Muscicapidæ*, and the representative of the true *Muscicapa*,—an arrangement, which from our familiarity with the species, and from its exhibiting characters the most remote from those of all the neighbouring groups, appears to be the most expedient,—little deviation will be found to exist between some of the Australian species of the family and the European type. The three following species belonging to the

Society's

Society's collection accord very closely with the general characters of that type. The construction of the bill is nearly the same; in our birds that member being only in a slight degree longer and more gracile. The wing has the same formation; the first quill-feather being short, and the second and third gradually exceeding it; the only difference discernible in this member is, that in the European bird the fourth feather is the longest, while in ours the fifth rather exceeds the fourth. The legs and feet afford no mark of distinction; unless, perhaps, we should say that in our birds the *tarsi* are somewhat longer. These slight differences do not exhibit sufficient ground for separation between the birds of these distant countries; particularly as there is a striking resemblance in the disposition of their colours. We may, for instance, trace the white front, and the white markings on the wings and tail of *M. atricapilla* in the Australian species. There are several species described by authors as belonging to New Holland, the description of whose colours approaches very nearly to that of the birds before us. We have not seen these birds, but consider it probable that they belong to the same group.

1. Multicolor. *Musc. nigra; fronte, maculâ tectricum, fasciâ remigum, rectricum lateralium strigâ, crissoque albis; pectore abdomineque coccineis.*

Muscicapa multicolor. *Gmel.* i. *p.* 944. *no.* 74.
Muscicapa erythrogastra. *Lath. Ind. Orn. p.* 479. *no.* 50.
Red-bellied Flycatcher. *Id. Gen. Hist.* vi. *p.* 209. *no.* 88. *pl.* 100.

We have referred this bird to the *red-bellied Flycatcher* of Dr. Latham, although that species does not possess the white markings on the wing-coverts or the tail which are seen in our bird, as far at least as we can judge both from the figure and description given by that gentleman. Such differences in the white

markings, we must observe, are important; similar differences form the points of distinction between our European species, *M. collaris*, Bechst., and *M. atricapilla*, Linn. But at present we have not sufficient grounds for decision on this subject; the few specimens we have in this country exhibiting much appearance of variation. We therefore merely express our doubts.

We have necessarily adopted Gmelin's name for this species instead of Dr. Latham's, in as much as the former has the right of priority. Dr. Latham, although he described and figured the bird in 1783, did not give it a scientific name until he published his "*Index Ornithologicus*" in 1790, two years after the publication of Gmelin's "*Systema.*" A line of distinction must be drawn by which we can invariably determine the choice of names, where a species or a group has more than one; and the date of publication seems to be the justest and most uniform by which we can be regulated. In the present instance, however, and in many others of a similar description, we have to regret, that whatever credit is due to him who confers a title on a group in nature,—and, trivial as it is, still some little reputation is attached to such points,—is transferred to the compiler, who puts together without knowledge or discrimination the observations of those who precede him, and thus stamps with his own name the labours of others, in detriment to the true naturalist, who works not from books, but studies in nature. The law, however, ought to be inflexible; and as such it would be expedient for naturalists not to exhibit the fruit of their labours without at the same time characterizing and naming them.

In Mr. Caley's MSS. are the following observations on the specimens in our collection. "*Australasian Redstart.*—This is by no means to be called a plentiful bird, and it seems to be scattered over a great space of country. In the month of November I saw

I saw it when far distant in the mountains, the roughest part of the country I had then or since visited. In the months of March and April, when I was in Western Port, it came and perched on the rigging of the vessel.—I apprehend it is migratory; but if this is the case, it does not depart to any great distance."

2. LATHAMI. *Musc. nigra, pectore abdomineque purpureo-roseis, maculâ frontali crissoque albis.*

Var. β? *rectricibus tribus extimis internè albo-marginatis.*

Frontis macula subrotunda, alba. *Remiges rectrices*que fusco-nigræ, subtus pallidiores. *Tectrices* inferiores nigræ. *Rostrum* nigrum. *Pedes* fusci. Longitudo *corporis*, $4\frac{1}{4}$; *alæ* a carpo ad remigem quintam, $2\frac{1}{2}\frac{1}{0}$; *caudæ*, $2\frac{3}{1}\frac{}{0}$; *rostri* ad frontem, $\frac{2}{5}$, ad rictum, $\frac{1}{2}$; *tarsi*, $\frac{7}{1}\frac{}{0}$.

Muscicapa Lathami. *V. in Zool. Journ. vol.* i. *p.* 410. *pl.* 13.

For the same considerations that influenced us when we referred the last bird to a described species of Dr. Latham, although it evinced some marks of difference from the figure of that species, we are inclined to consider the bird before us as a variety of the *Muscicapa Lathami* of the *Zoological Journal*. It differs from the specimen there described in having the three outer tail-feathers margined internally with white. The specimen in the Society's collection was met with at Port Jackson by Mr. Brown, August 1803.

3. GOODENOVII. *Musc. nigra; abdomine, strigâ longitudinali alarum, rectricumque duarum lateralium marginibus albis; fronte, pectoreque vividè coccineis.*

Frontis sincipitis partis *pectoris*que plumæ basi albæ, apice coccineæ. Striga lata alba longitudinaliter extendit per *tectrices remiges*que secundarias. *Remiges* quarta et quinta leviter in medio externè albo-marginatæ: cæteræ utrinque fasciâ

fasciâ albâ in medio notatæ; subtus pallidè fuscæ, pogoniis, ut supernè, albo-notatis. *Tectrices* inferiores albæ. *Abdominis* latera parcè coccineo imbuta. *Rectrices;* prima alba, strigâ longâ basali internâ, brevique subapicali externâ fuscis notata; secunda fusca, strigâ in medio pogonii externi, margineque apicali albis notata: cæteræ fusconigræ, subtus pallidiores. *Pedes* fusci. Longitudo *corporis*, $3\frac{4}{5}$; *alæ* a carpo ad remigem quartam, $2\frac{9}{20}$; *caudæ*, $2\frac{1}{10}$; *rostri* ad rictum, circiter, $\frac{1}{2}$; *tarsi*, $\frac{7}{10}$.

In honorem Viri reverendissimi eruditissimique, SAMUELIS GOODENOUGH, *Carliolensis Episcopi, Societatis Linneanæ* PRO-PRÆSIDIS, *in Historiæ Naturalis Scientiâ præstantis, hanc avem eximiam nominavimus.*

This beautiful species was discovered by Mr. Brown on the South coast of New Holland in 1802.

Genus. RHIPIDURA*.

Rostrum breve, depressum, basi latum, apice compressum, *culmine* arcuato; *mandibulâ* superiore apice emarginatâ; *naribus* basalibus, ovalibus, setis plumulisque ferè obtectis; *rictu* vibrissis confertis mandibulas longitudine ferè superantibus instructo.

Alæ mediocres, subacuminatæ; *remige* primâ brevissimâ, secundâ duplò longiore, tertiâ et quartâ, quæ est longissima, gradatim longioribus.

Cauda elongata, patula, apice rotundata.

Pedes mediocres, graciles, *acrotarsiis paratarsiis*que integris.

This group may be at once recognised as offering strong marks of distinction from the true *Muscicapa* in the fan-like structure of the tail. In the birds which feed entirely or par-

* 'Ριπις *flabellum*, and ουρα *cauda*.

tially

tially in the air this member becomes of much importance, as contributing more or less to their support or government in their aërial movements. In the true *Muscicapa* its general character is that of being slightly forked: in the present group it is rounded at the *apex;* but what it loses in that forked structure, which is generally supposed to be most conducive to the purposes of flight, it gains in being lengthened and capable of being spread out like a fan, so as to give the bird a greater power in the air. The group is also distinguished by the great length and number of the rictal bristles, which exceed the bill itself in length. This also is an important character among the birds that feed on insects in the air, as serving to encompass and secure their prey: and the greater or less developement of the character becomes a material point of distinction among them. The wings, although very similar in structure to those of *Muscicapa*, are less rounded, and, being in a slight degree acuminated, possess perhaps somewhat superior powers of flight. We have not hitherto noticed any birds possessing the characters of the group, except the New Holland species.

1. Flabellifera. *Rhip. fusco-nigra; maculâ superciliari postocularique, gulâ, tectricum apicibus, rectricumque rhachibus et apicibus albidis; abdomine ferruginescente.*

Muscicapa flabellifera. *Gmel.* i. 943. *no.* 67.
Fan-tailed Flycatcher. *Lath. Gen. Hist.* vi. *p.* 184. *no.* 44. *pl.* 99.

The figure that Dr. Latham gives of this species has much more white on the lateral tail-feathers than our bird. But that gentleman affirms that the species is subject to much variation. Mr. Caley thus observes on the manners of this bird. "*Fan-tail.*—There is something singular in the habits of this bird. It frequents the small trees and bushes, from whence it suddenly darts at its prey, spreading out its tail like a fan, and to appear-

ance

ance turning over like a *tumbler Pigeon*, and then immediately returning to the same twig or bough from whence it sprang. These actions it continues constantly to repeat. The skin is very tender; and it is difficult after having taken it off the body to restore it again to its proper shape. The species is very common about Paramatta; and I do not recollect having missed it at any period of the year."

2. MOTACILLOIDES. *Rhip. nigra; maculâ superciliari, pectore medio, abdomine, crissoque albis; remigibus nigro-fuscis.*

Gulæ latera parcè albo variegata. *Dorsi* color niger in *pectus* descendit, fasciam interruptam pectoralem exhibens, *pectoris*que colorem album, ut in circulo, ferè circumcingens. *Pteromata* ad apicem parcè albo-marginata. *Tectrices* inferiores nigro alboque variæ. *Remiges* fuscæ, subtus pallidiores. *Rostrum pedes*que nigri. Longitudo *corporis*, $7\frac{1}{5}$; *alæ* a carpo ad remigem quartam, $3\frac{1}{5}$; *caudæ*, $4\frac{1}{2}$; *rostri* ad frontem, $\frac{2}{5}$, ad rictum, $\frac{3}{5}$; *tarsi*, $\frac{9}{10}$.

This species was discovered by Mr. Brown at George's River in September 1803. It bears a great resemblance to the description of Dr. Latham's *Motacilla atricapilla**, or the *Black-topped Flycatcher* of his "*General History*†", but differs in the colour of the bill, back and throat. The latter species most probably belongs to the present group.

3. RUFIFRONS. *Rhip. fusco-brunnea, fronte, superciliis, dorso infimo, caudæ basi, abdomineque infimo rufis; jugulo nigro, gulâ pectoreque albis, hoc nigro-maculato; remigibus rectricibusque fuscis, his apice albido.*

Muscicapa rufifrons. *Lath. Ind. Orn. Supp. p.* 1. *no.* 5.
Rufous-fronted Flycatcher. *Id. Gen. Hist.* vi. *p.* 213. *no.* 95.

* *Ind. Orn. Supp.* p. liii. no. 1. † Vol. vi. p. 214. no. 96.

Mr.

Mr. Caley appends the following remarks to this species. "This bird appears to me to be a rare one, at least I do not recollect having ever seen any other specimen than the present. I met with it on the 15th of October 1807 at Cardunny, a place about ten miles to the north-east of Paramatta. It is a thick brush (or underwood), and is the resort of the *great Bat*."

Genus. Seïsura*.

Rostrum elongatum, subforte, valdè depressum, basi medioque latum, *mandibulâ* superiore ad apicem subarcuatâ, subemarginatâ; *naribus* basalibus, ovalibus, setis plumulisque obsitis; *rictu* setis brevibus parcè instructo.

Lingua† ad apicem et ad latera laciniata.

Alæ subelongatæ, ad medium caudæ extendentes; *remige* primâ brevi, secundâ et tertiâ gradatim longioribus, quartâ quintâ et sextâ æqualibus longissimis, tertiâ et septimâ his paulò brevioribus; tertiæ quartæ et quintæ *pogoniis* externis in medio paulatim latioribus.

Cauda elongata, patula, apice ferè æqualis.

Pedes mediocres, *acrotarsiis* scutellatis, *paratarsiis* integris.

This group bears a very close resemblance to the latter in the form of its tail, and we consequently expect to find in it a similarity of habits. In this expectation we shall not be disappointed, as the concurrent testimony of all the eye-witnesses of the manners of the bird which forms the type of the genus represents it as being an active and restless bird, moving its tail when in quest of insects like the European *Motacilla*, and spreading it out like the preceding group of *Rhipidura* when it darts

* *Σειω quatio*, and *ουρα cauda*.

† The tongue of the type of this genus, of which a specimen was fortunately attached to one of the birds in the Society's collection, differs from that of the European *Musc. grisola* only in being longer, the length being in proportion to that of the bill.

darts upon its prey. It is, however, sufficiently distinguished from *Rhipidura* by the tail being even, not rounded, at the end. The bill also is much more lengthened, more depressed, and stronger; and it is deficient in those elongated bristles which protect the *rictus* of the preceding birds. The formation of the wing also of both these genera will be observed, from the characters given of each, to be materially different: and the marked scutellation of the *tarsi* separates the present group from the preceding, and indeed from most of the *Muscicapidæ* that we have as yet had an opportunity of examining.

1. VOLITANS. *Seïs. suprà nigra, subtus alba; capite metallicè atro, remigibus fuscis.*

Turdus volitans. *Lath. Ind. Orn. Supp. p.* xli. *no.* 10.
Volatile Thrush. *Id. Gen. Hist.* v. *p.* 122. *no.* 151.

We find the following observations on this species in Mr. Caley's MSS. "This bird is called by the colonists *Dishwasher*. It is very curious in its actions. In alighting on a stump of a tree it makes several semicircular motions, spreading out its tail at the time, and making a loud noise, somewhat like that caused by a rasor-grinder when at work. I have seen it frequently alight on the ridge of my house, and perform the same evolutions. I have often considered it, when I witnessed these manners, to be the *Wagtail* of the colony.—The stumps of trees on which it alights are those which have been left standing, where the ground has been cleared; the trees themselves having been cut down about a yard from the ground."

Genus. MYIÄGRA*.

Rostrum rectum, subbreve, depressum, basi latum, multò latius quàm altum; *mandibulâ* superiore emarginatâ; *naribus* basalibus,

* *Μυια musca*, and *αγρευω venor.*

salibus, ovalibus, setis plumulisque ferè obtectis; *rictu* vibrissis fortibus hirsuto.

Alæ mediocres subrotundatæ; *remige* primâ brevi, secundâ duplò ferè longiore, tertiâ quartâ et quintâ ferè æqualibus longissimis.

Cauda mediocris, lata, æqualis aut interdum subfurcata.

Pedes graciles, mediocres; *acrotarsiis* scutellatis, scutorum suturis vix decernendis.

The necessity of subdividing the overgrown Linnean genus of *Muscicapa* has long been acknowledged: and the difficulty of seizing upon such characters as will serve to distinguish such subdivisions has been equally admitted. Where so much similarity prevails as in the characters belonging to all the species of the truly natural group of *Muscicapidæ*, it is only by observing the different modifications of the same characters,—by fixing, in fact, upon the greater or less developement of them, and not by detecting any tangible differences among them,—that we can hope to draw such boundary lines between the groups of the family as will restrain the number of species contained in each within moderate limits.

Hitherto the only material subdivisions that have been instituted in this family consist of the genera *Platyrhynchus*, Desm., and *Muscipeta*, Cuv. The former of these groups includes those birds in which the broad and flattened bill, peculiar to the Linnean *Muscicapæ*, is carried to the extreme bounds of its developement. The breadth, which is nearly equal to that of the head, extends nearly the whole length of the bill, which becomes narrower only towards the *apex*. Such a character affords a good foundation for a group. The genus *Muscipeta* does not appear to be equally well defined. As it has been latterly extended by those ornithologists who have adopted the name of

M. Cuvier's genus, it seems calculated to embrace all the species of the family which do not belong to the European form; in fact, merely to draw a geographical line of demarcation between the European and extra-European species. To those who have had an opportunity of observing the mode in which the characters of the *Muscicapidæ* vary in the numberless foreign species which we already possess, and which are daily increasing our collections, it must be evident that such a wide latitude includes in the genus *Muscipeta* a vast variety of forms: while at the same time it affords but little relief to the student in lessening the number of species detached from the original *Muscicapa*.

It appears to us, however, that some advance will be made to the more luminous arrangement of this family, by restricting the species of *Muscipeta* to those which exhibit the characters originally laid down by M. Cuvier for the group, and which accord with the birds enumerated by him as its types. From these we may perhaps select the *Muscicapa Paradisi* of Linnæus as the most conspicuous, and best fitted to point out the characters which that eminent naturalist designed to particularize. We here perceive a somewhat elongated bill, which appears intermediate with respect to its breadth between the narrower bills of the European *Muscicapæ*, and the widely-dilated bill of *Platyrhynchus*. The tail also is graduated. The group, thus restricted, will contain a number of well-defined species, which at present appear to us proper to Africa and India, and which more or less accord with this type. In addition to this group, we have ourselves already pointed out two other forms among our New Holland species, which, besides the modifications of their bills, exhibit by the structure of the tail, and the use to which it is applied, some natural grounds for separation. We venture in addition to propose another group, characterized above, which we have reason to hope will still further serve to

afford

afford some assistance towards the subdivision of the family. In it the bill, like that of the group to which we would restrict the name of *Muscipeta*, is intermediate in breadth between the bills of the true *Muscicapa* and *Platyrhynchus*. It is at the same time moderately short; in which it differs from the bill of *Muscipeta*. The tail is even, by which character it may be also distinguished from the latter genus; and moderate in length, by which it is separated from the equally even but long-tailed *Seïsura*. In drawing a line between the species of this family we are inclined to lay much stress upon the structure of the tail. Nearly allied as the whole group is to the *Fissirostral Birds* which feed upon the wing, and being themselves accustomed to seize their prey in the air, a member which, like the tail, contributes to their powers of flight, or support upon the wing, must be considered as of much importance: and in a numerous family like that before us, which calls for subdivision, and in which no stronger mark of distinction is tangible, it appears to us that the variations in the structure of the tail afford not merely a convenient artificial ground of separation, but one which is sufficiently natural. The group, as we have at present characterized it, does not appear to be peculiar to New Holland. Some American species, such as the *Muscicapa querula* and *M. rapax* of Wilson's "*Ornithology*," appear to belong to it.

1. Rubecoloides. *My. plumbeo-grisea, gutture pectoreque rufis, abdomine albido, pteromatibus remigibus rectricibusque fuscis.*

*Pteromata remiges*que interiores pallido-fusco-marginatæ. *Tectrices* inferiores albidæ, fusco-variegatæ. *Remiges rectrices*que subtus grisescentes. *Rostrum* nigrum. *Pedes* fusci. Longitudo *corporis*, $5\frac{1}{2}$; *alæ* a carpo ad remigem quartam, 3; *caudæ*, $2\frac{3}{4}$; *rostri* ad frontem, $\frac{2}{5}$, ad rictum, $\frac{7}{10}$; *tarsi*, $\frac{7}{10}$.

2. Plumbea.

2. PLUMBEA. *My. suprà fusco-plumbea, capite cervice gutture-que nitidè cæruleo-plumbeis; abdomine crissoque albis.*

Remiges subtus fuscæ, ad basin internè albescentes. *Tectrices* inferiores albæ, prope carpum fusco-maculatæ. *Rectrices* subtus pallidè fuscæ. *Rostrum pedes*que nigri. Longitudo *corporis*, $4\frac{1}{2}$; *alæ* a carpo ad remigem quartam, 3; *caudæ*, $2\frac{3}{4}$; *rostri* ad frontem, $\frac{9}{20}$, ad rictum, $\frac{7}{10}$; *tarsi*, $\frac{7}{10}$.

3. MACROPTERA. *My. suprà olivescenti-fusca, subtus albescens, remigibus rectricibusque fuscis, harum exterioribus gulâ crisso-que albis.*

Remiges subtus pallidiores, basin versùs internè albescentes. *Ptila* inferiora albida, fusco parcè notata: *pteromata* alba. *Rectrices*, prima tota alba, secunda ad basin fusca, tertia ad apicem alba, cæteræ fuscæ, subtus pallidiores. *Rostrum pedes*que nigri. Longitudo *corporis*, $5\frac{1}{10}$; *alæ* a carpo ad remigem quartam, $3\frac{17}{20}$; *caudæ*, $2\frac{1}{5}$; *rostri* ad frontem, $\frac{2}{5}$, ad rictum, $\frac{13}{20}$; *tarsi*, $\frac{13}{20}$.

The comparative length of the wings in this species and the shortness of the tail distinguish it from the other species of this group. The wings reach to the extremity of the latter member. In other characters it accords sufficiently with the group. Mr. Caley informs us that the boys of the colony used to call it *Winter*, the reason of which he does not give. He adds, that "the bird has all the actions of the British *Robin Redbreast*, except coming inside houses. When a piece of ground was fresh dug, it was always a constant attendant."

Genus. MONARCHA.

Rostrum forte, subelongatum, basi latum, subdepressum; *culmine* carinato, apice arcuato; *mandibulâ* superiore emarginatâ; *naribus*

naribus basalibus, rotundis, setis plumulisque opertis; *rictu* vibrissis fortibus instructo.

Alæ mediocres, subrotundatæ; *remige* primâ brevi, secundâ duplò longiore, tertiâ et quintâ æqualibus, quartâ quæ est longissima, paulò breviori; cæteris gradatim breviscentibus: tertiæ ad sextam inclusam *pogoniis* externis paulatim in medio latioribus.

Cauda mediocris, æqualis.

Pedes mediocres, *acrotarsiis* scutellatis, *paratarsiis* integris.

The powerful construction of the bill of this group separates it at once from the other species of the *Muscicapidæ*, with which in the depression and breadth at the base of that member, the strength of the rictal bristles, and the general characters of the wings and legs, it otherwise accords. This strength of bill would incline us to place the bird among the *Laniadæ*, and in the subfamily of *Tyrannina*, Swains., of which it might thus be considered to form the Australian representative, did not the other characters of its structure evince a more predominant inclination to the *Muscicapidæ* than to the *Tyranni*. The group may, however, be considered to stand intermediately between the two families; and might perhaps be referred with equal propriety to either, according to the characters which each naturalist would select as most predominant, and most convenient to guide him in his subdivisions. The habits of the birds of the group, hitherto unknown, will have much influence in determining its exact station.

1. Carinata. *Mon. plumbea; genis collique lateribus pallidioribus; fronte, gulâ, notâque carpali nigris; abdomine, tectricibus inferioribus, crissoque ferrugineis.*

Muscipeta carinata. *Swains. Zool. Illust. pl.* 147.

The

The specimen of this species in our collection was procured by Mr. Brown at the Bay of Inlets near the inner entrance of Thirsty Sound, September 1802.

Tribus. CONIROSTRES. *Cuv.*

Fam. FRINGILLIDÆ.

Genus. FRINGILLA. *Auct.*

There is no group which requires more revision than the extensive family of *Fringillidæ*. Although M. Cuvier in his "*Règne Animal*" has pointed out some well-defined divisions of the family, yet there still remains such a number of species belonging not merely to the Linnean *Fringilla*, but which have indiscriminately and apparently without any decided law of demarcation been scattered by the strict followers of Linnæus in his genus *Loxia*, that many more subdivisions must yet be effected before the whole group can be placed in an intelligible and luminous order. The few species that occur in the New Holland collection do not afford us materials or opportunity for throwing any light at present upon the subject. They are chiefly well-known species; and we shall introduce them without any attempt at more accurate arrangement, under the comprehensive genus *Fringilla*.

1. LATHAMI. *F. grisescenti-brunnea; loris, fasciâ latâ pectorali, lateribusque abdominis nigris; horum maculis rotundis, gutture, abdomine, crissoque albis; uropygio coccineo.*

Fringilla leucocephala, *var.* *Lath. Ind. Orn. Supp. p.* xlviii. *no.* 1.

Spotted-sided Grosbeak. *Id. Gen. Hist.* v. *p.* 248. *no.* 50. *pl.* 89.

It is only in a very urgent case, and where a decided inapplicability of name occurs, that we would venture to change the original

original name of any species. The present case seems to be one where we are called upon to risk such an alteration. Out of numberless birds of this species which have come under our observation, we have seen none in which the colour of the head was not the same as that of the bird before us, a grayish-brown. The white-headed specimen which Dr. Latham figured, and from which he derived the name of *leucocephala*, appears to be not a typical individual of the species, but an accidental, or, as far as is hitherto known, an unique variety of it. Even still we should adhere to an established name, however strictly inapplicable to an entire group, if the original describer had named the species from an actual specimen. But in the present instance we find that Dr. Latham's figure and description are taken from a drawing. We shall not, however, deprive this beautiful bird of its original name without assigning it a better. And in proposing the present alteration, we hope the venerable Father of Ornithology will pardon us for the liberty we have taken, and accept this slight tribute of gratitude for the valuable assistance which his labours have afforded us in our ornithological studies.

Mr. Caley calls this species *Red Diamond Bird*,—the colonial name; he met with it occasionally, but not in abundance. He is not aware of its habits.

2. Bella. *F. brunnescenti-grisea, fasciis numerosis nigris lineata; subtus alba, nigro-fasciata; loris nigris; uropygio rectricumque mediarum basi coccineis.*

Loxia bella. *Lath. Ind. Orn. Supp.* xlvi. *no.* 8.
Black-lined Grosbeak. *Id. Gen. Hist.* v. *p.* 267. *no.* 83.

Some specimens of this species in the collection were brought by Mr. Brown from Port Jackson, where he obtained them September 1803.

3. BICHENOVII. *F. murino-brunnea, graciliter fusco-fasciata; pteromatibus remigibusque albo-tessellatis; genis, gutture, abdomine, uropygioque albis; loris, fasciâ gracili gutturali alterâque abdominali, dorso imo, crisso, rectricibusque nigris.*

Capitis vertex saturatiori-brunneus, fasciis fuscis vix decernendis: *ptila* pallidiora fasciis numerosis conspicuis. *Remiges* primariæ, externarum pogoniis extimis ad medium usque et gradatim paulò ultrà, internarum ad apicem, albo-maculatis; secundariæ, exteriores pogoniis extimis, interiores utrinque, maculis albis in paribus dispositis notatæ: subtus, primariæ fuscæ, secundariæ, ut supernè, maculis conspicuis instructæ. *Pteromata* maculis albis, ut in remigibus secundariis, notatæ. *Tectrices* inferiores albæ, ad carpum nigro notatæ. Fascia gracilis nigra gutturalis a capitis lateribus utrinque extendit, genas gulamque circumcingens. Fascia abdominalis ab humeris utrinque extendit, pectus ab abdomine dividens. *Rectrices* suprà et infrà nigræ. *Rostrum, mandibulâ* superiore ad basin plumbeo-nigrâ, apice albido, inferiore ad basin plumbeo-nigrâ, apice tomiisque albidis. *Pedes* plumbeo-fusci. Longitudo *corporis*, $3\frac{4}{5}$; *alæ* a carpo ad remigem secundam, $2\frac{1}{10}$; *caudæ*, $1\frac{3}{4}$; *rostri*, $\frac{7}{20}$; *tarsi*, $\frac{11}{20}$.

In honorem viri nobis amicissimi JACOBI E. BICHENO, *Armigeri, Linneanæ Societatis* SECRETARII, *Zoologiæ studiosissimi, hæc species perpulchra nominatur.*

This delicately-coloured species was discovered by Mr. Brown at Shoalwater Bay and Broad Sound, September 1802.

4. TEMPORALIS. *F. olivaceo-brunnea subtus albescens, capite cærulescenti-griseo, tæniâ per oculos uropygioque coccineis.*

Fringilla

Fringilla temporalis. *Lath. Ind. Orn. Supp.* xlviii. *no.* 4.
Temporal Finch. *Id. Gen. Hist.* vi. *p.* 115. *no.* 91. *Lewin, Birds of New Holl. pl.* 12.

"This bird," says Mr. Caley, "which the settlers call *Red-bill*, is gregarious, and appears at times in very large flocks. I have killed above forty at a shot. They frequently visited my garden in the winter to feed on a species of grass-seed."

Fam. Sturnidæ.

We have introduced the mention of this family for the purpose of stating the great deficiency, if not total want of the birds belonging to it, which prevails in New Holland. In the continents of the Old and New World the *Sturnidæ* congregate in large flocks, and follow the herds of the larger herbivorous *Mammalia*, from whom they obtain a great portion of their nourishment, collecting the insects with which they abound, and the remains of the herbaceous food which are found in their neighbourhood. The general want of these herbivorous *Quadrupeds* in Australia, accounts for a corresponding deficiency in those birds which look to them for a chief portion of their support. A similar deficiency in the *Coprophagous* insects has been equally observed* in the same country, and a similar cause assigned for it. A species however of the family is now before us, which has been for some time included in our New Holland collection. It bears no note of whence it came, nor any donor's name; and we have some doubts whether it might not have crept into the collection by mistake. As we have been particularly guarded against introducing any species which has not come to the Society from an authentic source, we refrain from giving it as a New Holland bird, but shall merely

* See "*Horæ Entomologicæ*," part i. p. 59.

characterize it*, with a statement of our doubts. We have also to mention that a pair of the *Sturnus militaris*, Linn., a species also belonging to this family, have been presented to the Society by a gentleman who received them with other birds from New Holland. The species has hitherto been considered exclusively South American: and as the skins of our birds might easily have been imported from America into New Holland, we consider it extremely doubtful that they were natives of the latter country. The subject is one of importance, as involving not merely the fact of the wide dispersion of a species, but of the existence of a group in New Holland as yet unnoticed there; and we therefore consider it prudent merely to state the above circumstances without any further comment.

Fam. Corvidæ.

Genus. Cracticus. *Vieill.* (Barita. *Cuv.*)

1. Tibicen. *Cr. niger, nuchâ, tectricibus alarum, dorso imo, uropygio, crisso, caudæque basi albis.*

Coracias tibicen. *Lath. Ind. Orn. Supp. p.* xxvii. *no.* 2.
Piping Roller. *Id. Gen. Hist.* iii. *p.* 86. *no.* 23.

"The birds of this species," Mr. Caley informs us, "are gregarious, and found only in particular places. In the morning they make a loud whistling noise high up in the trees.—The natives call the species *Ca'ruck*: and they tell me it builds its nest of sticks lined with grass in *Iron-bark* and *Apple-trees* (a species of *Angophora*). It has three young ones.—These birds

* Genus. Lamprotornis. *Temm.*

Morio. *Lamp. corpore toto nigro, metallicè subnitente.*

*Rostrum pedes*que nigri. Longitudo *corporis*, $9\frac{1}{4}$; *alæ* a carpo ad remigem secundam, 5; *caudæ*, $3\frac{13}{20}$; *rostri* ad frontem, $\frac{19}{20}$, ad rictum, $1\frac{3}{10}$; *tarsi*, $1\frac{7}{10}$.

do

do not appear to be migratory. To the best of my recollection I have never missed them."

2. Varius. *Cr. niger; torque nuchali, ptilis, pteromatum strigâ longitudinali, dorso imo, uropygio, abdomine, crisso, rectricumque lateralium apicibus albis.*

Coracias varia. *Lath. Ind. Orn. p.* 173. *no.* 22.
Cassican de la Nouvelle Guinée. *Pl. Enl.* 628.
Pied Roller. *Lath. Gen. Hist.* iii. *p.* 86. *no.* 24.

The specimen in the Society's collection was found by Mr. Brown at Keppel's Bay, in August 1802.

3. Strenerus. *Cr. niger; maculâ alarum, crisso, caudæque basi apiceque albis.*

Coracias strepera. *Lath. Ind. Orn.* 173. *no.* 21.
Corvus streperus. *Leach, Zool. Misc. vol.* ii. *pl.* 86.
White-vented Crow. *White's Journ. pl. in p.* 251.
Grand Calybé. *Le Vaill. Ois. de Par. &c. pl.* 24.
Le Cassican reveilleur. *Vieill. Gal. des Ois. pl.* 109.

"This bird," says Mr. Caley, "is called by the colonists *Hircine Magpie*. It is very good eating, except the hinder parts, which have a strong goatish smell. It is gregarious. I have known large flocks of these birds come occasionally into the small trees (*Gum-wattle*) about Government House and elsewhere, and hop about from tree to tree until driven away by being fired at. They may also be seen in large flocks on the new-sown wheat, particularly in the depth of winter."

Genus. Corvus. *Linn. et Auct.*

1. Coronoides. *Corv. totus niger subcærulescens, rostro subelongato.*

Rostrum

Rostrum sublongum vix glabrum. Longitudo *corporis*, 22; *alæ* a carpo ad remigem tertiam, 14; *caudæ*, 9; *rostri*, $2\frac{3}{10}$; *tarsi*, $2\frac{3}{10}$.

This bird has a very general resemblance to our common species *C. corone*. It is to be distinguished chiefly by its superior size, its length being twenty-two inches, while that of the European species is eighteen inches*. The bill also differs. In our bird this member is much more elongated in proportion to its size; the *culmen* is less rounded and arched, and the *gonys* of the under mandible less prominent: it is also less smooth and glossy than in *C. corone*.

In Mr. Caley's MSS. are the following remarks. "This bird is gregarious and not to be met with at all times. Its native name is *Wa'gan*.—Moowattin, a native follower of mine, tells me that it makes its nest like the *Ca'ruck* (*Cr. tibicen*), but that he never met with more than one nest, which was in a *Coray'bo* tree, at the Devil's Back, about four miles from Prospect Hill. He and several other natives at first took it to be a *Curriaygun's* (*Scythrops*) nest. There were two young ones in it, and the broken shells of two eggs, which were quite black. There was a quantity of dung under the tree.—

"I have observed that the croak of this bird is not so hoarse as that of *C. corone*. This was also remarked by the same native when with me in this country (England) on his hearing a Crow one morning near Fulham.—The people in the colony say that it will devour chickens: this I rather doubt."—In a subsequent Note Mr. Caley says, that he remembers once or twice meeting with a single bird of this species; and once more particularly in the month of November 1804, when in the roughest part of the mountains, he observed for several days a pair of them flying about.

* *Montague, Ornith. Dict.*—Art. "Crow-carrion."

about. The people who accompanied him observed that they must be lost, or they would never remain in so dreary a country. —On the whole, however, he considered them as gregarious.

Genus. PTILONORHYNCHUS. *Kuhl.*

1. MACLEAYII. Lath. MSS. *Ptil. metallicè ater; plumis nitentibus sericeis, rostri apice pedibusque flavescentibus.*

Fœm. *suprà viridis, subtus pallidior, maculis albis lunulisque fuscis variegata: pteromatibus, remigibus, rectricibusque rufo-brunneis.*

Mas. *Pteromata* atra apicibus metallicè nitentibus. *Remiges rectrices*que atræ sine nitore, subtus fuscescenti-atræ. *Mandibulæ* ad basin nigræ, marginibus apicibusque flavescentibus. Longitudo *corporis*, $12\frac{9}{10}$; *alæ* a carpo ad remigem quartam, $6\frac{3}{5}$; *caudæ*, $4\frac{17}{20}$; *rostri* ad frontem, $\frac{19}{20}$, ad rictum, $1\frac{1}{10}$; *tarsi*, $1\frac{4}{5}$.

Fœm. *Pileus* olivaceo-viridis: *nucha, dorsum, uropygium*que olivacescenti-virides; rhachibus plumarum pallidioribus. *Genarum* plumarum rhaches albæ. *Gulæ* plumæ albæ margine gracili fusco. *Juguli* plumæ in medio albidæ fusco-marginatæ, rhachibus albis: *pectoris abdominis crissi*que plumæ flavescentes, in medio lunulâ transversâ fuscâ fasciatæ, rhachibus albis. *Pteromatum remigum*que secundariarum internarum apices fulvæ, tæniâ pergracili pallidâ terminatæ. *Tectrices* inferiores albidæ, fusco-maculatæ lunulatæque. *Remiges* subtus pallidè fuscescentes, basi internè fulvæ. *Rectrices* subtus pallidè fuscæ, basin versùs pallidiores. *Rostrum* nigrum. *Pedes* pallidè fusci. Dimensiones *corporis* paulò grandiores quàm in mari.

In honorem ALEXANDRI MACLEAY, *Armigeri, Societatis Linneanæ nuper* SECRETARII, *qui collectionem Australem avibus*

bus pretiosissimis ditavit, hanc speciem nominavimus, meritas gratias solventes.

Satin Grakle. *Lath. Gen. Hist.* iii. *p.* 171. *no.* 30.

Mr. Caley says that "the male of this species is reckoned a very scarce bird, and is highly valued. The natives call it *Cowry*, the colonists *Satin Bird*. I have now and then met with a solitary bird of this species: but I once saw large flocks of them on some newly-sown wheat, from whence they fled, on being scared, into a neighbouring brush: when all was again quiet, they soon returned to the wheat. They did not leave the brush above a few yards. There were no black ones among them; nor can I affirm that they were feeding on the wheat."

It is singular that this beautiful and well-known bird should never have as yet received a specific name. Although it has been made the type of a genus by M. Kuhl, and published as such by M. Temminck in his "*Manuel*," we no where have met with a scientific name for the species. We are happy to have the opportunity of uniting with Dr. Latham in designating so distinguished a bird by the name of the late respected Secretary of this Society.

2. Smithii. Lath. MSS. *Ptil. vividè viridis, subtus paulò pallidior albo-strigatus; remïgum internarum pteromatumque apicibus albo-maculatis; rectricibus lateralibus apice albis, extimis fuscis virescenti-nitidis.*

*Gutturis genarum*que plumæ in medio albo-maculatæ; *nuchæ, pectoris, abdominis*que in medio albo-strigatæ. *Remiges* fuscæ, pogonio externo viridi-marginato; subtus pallidiores. *Tectrices* inferiores albidæ, fusco-fasciatæ. *Rectrices* duæ mediæ totæ virides; cæteræ prope apicem fuscescentes apice ipso nigro; exteriores fuscæ, viridi-nitentes.

Rostrum

Rostrum pallidum. *Pedes* fusci. Longitudo *corporis*, 12; *alæ* a carpo ad remigem quartam, $6\frac{2}{10}$; *rostri* ad frontem, $\frac{19}{20}$, ad rictum, $1\frac{1}{10}$; *caudæ*, $4\frac{3}{4}$; *tarsi*, 2.

Varied Roller. *Lath. Gen. Hist.* iii. *p.* 86. *no.* 17.

In honorem Viri in scientiâ illustrissimi Jacobi Edouardi Smith, *Equitis Aurati, Societatis Linneanæ* Præsidis, *Zoologiæ patroni liberalissimi, hæc speciosissima avis nominatur.*

This species does not possess the velvet-like covering to the *nares* which is so conspicuous in the preceding species of *Ptilonorhynchus*. In its other characters, however, it sufficiently accords with the group; and by the deficiency in the covering of the base of the bill may be looked upon as forming the passage to the *Rollers* of Linnæus from the genus before us. The specimen in the Linnean collection was met with by Mr. Brown at Watham's River, November 1804.

Genus. Fregilus. *Cuv.*

1. Leucopterus. *Freg. corpore rostro pedibusque nigris, remigum pogoniis internis fasciâ albâ in medio notatis.*

Pyrrhocorax leucopterus. *Temm. Manuel*, *p.* 121.

The tail in this species of *Fregilus* is somewhat more elongated than in the typical species, and is also rounded at the end. The bill, wings and legs, however, sufficiently accord with the group, which is at present too limited to call for or admit of separation.

"This bird," Mr. Caley observes in his Notes, "is called *Waybung'* by the natives. They tell me it begins its nest by laying two sticks in a parallel manner; it then builds it up with mud or clay, and lines it with a few feathers. It is gregarious, and seems to prefer elevated situations, or such as

command a prospect of the country. I cannot consider it as migratory."

Tribus. SCANSORES. *Auct.*

Fam. PSITTACIDÆ. *Leach.*

The species of this family found in Australia are numerous, and they exhibit a considerable variety of form. These, with the exception of one or two groups which are equally met with in some of the adjoining islands in the Pacific Ocean, are peculiar to their own continent. They belong to two only of the five subfamilies of the *Psittacidæ;* those of the *Cockatoos* and the *long-tailed Parrakeets.* Hitherto we have seen no example from Australia of the true *Psittacus*, Auct., of the conterminous subfamily of *even-tailed Parrakeets*, or of the *Maccaws.*

Although from the general resemblance which the birds of this family bear to each other, it may at first sight appear difficult to determine which are the typical and aberrant groups, it strikes us that we may attain a clue to this point of distinction by attending to the construction of the bill, and tracing out the mode in which it varies from the strength and shortness apparent in some species, to the weakness and elongation exhibited in others. The food of the *Parrots* consists chiefly of nuts, seeds, and similar vegetable substances; and the bill, which possesses the greatest power in breaking the hard shells or rinds which inclose these substances, seems to point out the typical pre-eminence of the groups in which it is found. This strength of bill may be observed to be carried to the extreme in the two subfamilies of *Cockatoos* and *Maccaws.* In these birds the mandibles are of considerable size and thickness, and much more deep than long; more especially the under mandible, which is extremely short, and bent inwards at the *apex* so as to give the bill a greater power over the substances which

which it is designed to break. In speaking of the shortness of this member, we measure the space between the *rictus* and the *apex*, which in the birds to which we allude seldom equals the distance between the *mentum* and the same point. On the other hand, the remaining three subdivisions of the family have a longer, and consequently a weaker bill. The under mandible in particular becomes conspicuously elongated, the *tomia* or cutting edges being sometimes nearly straight, and the depth not equalling half the length. The bill thus assumes the general form which is found among birds, and deviates from that which appears peculiar* to this family. In some of these longer-billed birds, which we are thus inclined to consider aberrant among the *Parrots*, we shall have occasion to observe a deviation also from the mode of feeding prevalent in the family by the tongue partially superseding the use of the bill. Here we may trace the first approach to the *Picidæ*, *Certhiadæ*, and the honey-feeding *Tenuirostres;* birds which form a conterminous group immediately succeeding the present family of *Psittacidæ*, and of which the use of the tongue is the predominant character.

According to these views we shall consider the shorter- and

* We know no other bird in which this peculiar construction is found, except the *Fratercula Arctica*, Briss., in which species the depth of the bill from the front to the *mentum* is nearly equal to the length from the *rictus* to the *apex*. This analogical resemblance has given that bird the familiar name of *Sea-Parrot*. In some of the *Loxiadæ* also we see an approach to the same depth and shortness of bill, but not an equal developement of the character. And here also the name of *Psittarostra*, attached to one of the groups, indicates the same analogy. We may observe, that the food of the birds of this latter family is similar to that of the *Parrots*, and requires corresponding powers of bill. When we speak of the height of the bills among birds, we do not take into account those eminences which surmount the bills of some of the *Buceridæ*. These give an apparent rather than a real elevation to these members, and in no wise increase their strength.

stronger-billed birds as the typical group of this family, and shall commence our catalogue of the species in the Society's collection with the *Cockatoos*, or the

Subfam. PLYCTOLOPHINA.

Genus. PLYCTOLOPHUS. *Vieill.*

* Cristâ plicatili, acuminatâ, antrorsum tortâ.

1. GALERITUS. *Pl. albus; cristâ, remigum rectricumque lateralium pogoniis internis, pteromatibusque inferioribus sulphureis.*

Psittacus galeritus. *Lath. Ind. Orn. p.* 109. *no.* 80. *Kuhl, Nova Acta &c. vol.* 10. *p.* 87. *no.* 157.

Crested Cockatoo. *White's Journ. pl. in p.* 237. *Lath. Gen. Hist.* ii. *p.* 205. *no.* 136.

The following observations on this species are extracted from Mr. Caley's Notes. "This bird is called by the natives *Car'away*, and also *Cur'riang*. I have met with it in large flocks at the conflux of the Grose and the Hawkesbury rivers, below Mulgo'ey on the former river, and in the long meadow near the Nepean river. They are shy, and not easily approached. The flesh of the young ones is accounted good eating. I have heard from the natives that it makes its nest in the rotten limbs of trees, of nothing more than the vegetable mould formed by the decayed parts of the bough; that it has no more than two young ones at a time; and that the eggs are white without spots. The natives first find where the nests are by the bird making *Co'tora* in an adjoining tree, which lies in conspicuous heaps on the ground.—*Co'tora* is the bark stripped off the smaller branches, and cut into small pieces.—When the young ones are nearly fledged the old birds cut a quantity of small branches from the adjoining

adjoining trees, but never from that in which the nest is situated. They are sometimes found to enter the hollow limb as far as two yards. The nests are generally formed in a *Black-butted gum-tree;* and also in *Coroy'bo*, *Cajim'bora* and *Yarrowar'ry* trees (species of *Eucalyptus*).—Their breeding-places appear to be local."

** Cristâ rotundatâ, retrorsum incumbente.

2. Eos. *Pl. pallidè cineraceus; collo, corpore subtus, tectricibusque inferioribus rosaceis; cristâ albido-rosaceâ.*

Psittacus Eos. *Kuhl, Nova Acta &c. vol.* 10. *p.* 88. *no.* 159.

Perroquet kakatoe rosalbin. *Temm. Pl. Col.* 81.

Le Kakatoés rose. *Vieill. Gal. des Ois. pl.* 25.

Genus. Calyptorhynchus*.

Rostrum crassum, fortissimum, multò altius quàm longum, basi latum; *mandibulæ* superioris culmine compresso, a basi ascendente, maximè arcuato, apice introrsum inclinante; inferiore brevissimâ, dilatâ, fortiter emarginatâ, apice introrsum inclinante, plumis genarum præcipuè tectâ: *cristâ* retrorsum incumbente.

Alæ mediocres; *remigibus* secundâ tertiâ quartâ et quintâ ferè æqualibus longissimis, primâ et sextâ æqualibus; secundæ ad quintam inclusam pogoniis externis medium versùs emarginatis.

Pedes subfortes, *digitis unguibus*que mediocribus.

Cauda subrotundata, sublonga; *rectricum* rhachibus apice subelongatis, nudis.

The chief difference between this genus and that of *Plyctolophus* consists in the greater elevation and the comparative shortness of the bill. The latter group possesses a bill of

* *Καλυπτω celo*, and *ῥυγχος rostrum*.

nearly

nearly an equal length and similar construction to that of the true *Psittacus**, which immediately precedes the present subfamily. While *Calyptorhynchus* is allied to the *Maccaws* in the characters of this member, and thus evinces a higher developement than *Plyctolophus* of the typical peculiarities of the family. The *culmen* of the upper mandible is considerably curved and bent inwards at the *apex*; in some species when viewed in profile it has a semilunar appearance. The under mandible is much more dilated also than it is in *Plyctolophus*. In most specimens which we have seen of this genus the shafts of the tail-feathers are prolonged beyond the webs; a peculiarity which seems to indicate something distinctive in the economy of the birds. From all the accounts we have received of them they seem much less gregarious than the birds of the conterminous genus. The group appears to be confined to Australia. The black colour that prevails through these birds separates them also at first sight from the species of *Plyctolophus*, which are generally white. The species of the latter genus, which has been just enumerated in our catalogue, *Pl. Eos*, and the *Calyptorhynchus galeatus*, which will be presently noticed, both of

* The group of the *Psittacidæ*, to which the name of *Psittacus* should be applied, may perhaps be considered to be that which comprises the *Psitt. Amazonicus*, Briss., and some allied species. That at least is the group best known under the old scientific term, and at the same time under the familiar names of *Parrot* in our language, and *Perroquet* in the French, which correspond with it. In general, when we subdivide a group, we ought to retain the original name for that subdivision of it which contains the typical species. There are instances, however, where this mode cannot well be followed, as when the typical species have already been distinguished by generic names. This happens to be the case in the group before us, the typical species of which were the first that were separated by distinct names. These have long been called *Macrocercus* and *Plyctolophus*, or more familiarly *Maccaws* and *Cockatoos*; and we cannot venture to disturb these established names, even for the sake of scientific correctness. The most eligible rule, next to that of selecting the typical species for the original name, is probably that of selecting the species to which it has been most familiarly applied.

which

which partially deviate from the characteristic colouring of their respective congeners, bring the two groups into immediate contact.

1. Banksii. *C. atro-nitens, subtus flavescenti-undulatus, capite tectricibusque flavescenti-maculatis, rectricibus lateralibus medio coccineis nigro-fasciatis subtus flavescentibus.*

Psittacus Banksii. *Lath. Ind. Orn. p.* 107. *no.* 76. *Kuhl, Nova Acta &c. vol.* 10. *p.* 90. *no.* 163.

Psittacus magnificus. *Shaw, Nat. Misc. pl.* 50.

Banksian Cockatoo. *Lath. Gen. Hist.* ii. *p.* 199. *no.* 128. *pl.* xxvii. *Phill. Bot. Bay, pl. in p.* 267. *White's Journ. pl. in p.* 139.

"The native name of these birds," says Mr. Caley, "is *Geringora*. I have met with them in various parts of the country. In the north rocks, a few miles to the northward of Paramatta, I have frequently seen them, but never many together. The natives tell me it breeds in the winter in *Mun'ning-trees*, or *Blood-trees* of the colonists (a species of *Eucalyptus*). It makes no other nest than of the vegetable mould formed by the decay of the tree. It cuts off the small branches of the *Oak-trees* (a species of *Casuarina*), but makes no *Co'tora*. It has three young ones, but of the eggs I could obtain no information."

2. Funereus. *C. niger, subtus nigricanti-brunneus, regione paroticâ flavâ, rectricibus lateralibus medio flavicantibus nigro-imbutis.*

Psittacus funereus. *Shaw, Nat. Misc. pl.* 186. *Kuhl, Nova Acta &c. vol.* 10. *p.* 89. *no.* 161.

Funereal Cockatoo. *Lath. Gen. Hist.* ii. *p.* 202. *no.* 131.

Mr. Caley thus observes upon this bird. "Its native name is *Wy'la*, so called from the similitude of that word to the sound which it makes. I have never seen them together in any numbers,

bers, not more perhaps than half-a-dozen at a time: but I have met with them in many different places. Sometimes they came within half a mile of the centre of Paramatta, where I have shot them in the trees. The natives told me it made its nest in *Yar'ro-trees* (a species of *Eucalyptus*), using only the vegetable mould. It makes no *Co'tora*, but cuts off the small branches of *Apple-trees* (a species of *Angophora*). It has two young ones."

3. COOKII*. *C. niger, rectricibus lateralibus medio coccineis, rostro nigro.*

* This bird, together with five other new species of *Parrots* belonging to the Society's collection, were described by M. Temminck in the 13th volume of these Transactions. The same birds, and from the same collection, some of them being found exclusively in it, were also described by the late M. Kuhl in a Monograph of the family published in the "*Nova Acta Physico-Medica Academiæ Cæsareæ Leopoldino-Carolinæ Naturæ curiosorum,*" but described under different names from those of M. Temminck. A question here arises as to the respective right of these naturalists to have their names adopted. On the point of priority the case is as follows. M. Temminck's Paper was published in 1821: M. Kuhl's bears the date of 1820. But on the other hand, M. Temminck's Paper was read before the Society on the 21st of December 1819.—For our own parts, we have not the slightest hesitation in preferring the names of M. Temminck. We do not found our decision on the nice point of the act of reading before a chartered Society being to be considered as an act of publication; a point, however, which ought to be determined and acted upon as of much consequence to the interests of naturalists: but we go upon the broad principle, that when a naturalist has the exclusive authority to describe any subjects of Natural History, and has devoted himself to the task,—a fact of course to be ascertained from the public reading of his Paper,—any attempt to anticipate him in his descriptions, by taking advantage of the delays which sometimes unavoidably take place in the publication of extensive works, is perfectly unwarrantable, and ought decidedly to be discountenanced. Such are our views as to the general principle. In applying it to the present case, however, we must subjoin our suspicions that some mistake arose between those two gentlemen. M. Kuhl was the friend and coadjutor of M. Temminck during his visit to this country when he described the birds in question; and it is not probable that he would have interfered, unless under some misconception.

Psittacus

Psittacus Cookii. *Temm. Linn. Trans. vol.* xiii. *p.* 111.
Psittacus Leachii. *Kuhl, Nova Acta &c. vol.* 10. *p.* 91. *no.* 164. *tab.* iii.
Cook's Cockatoo. *Lath. Gen. Hist.* ii. *p.* 201. *no.* 130.

The colour of the bill of the two specimens of this bird in the Society's collection is a deep and decided black. M. Temminck in his Paper on these birds, in a former volume of these Transactions, says that the bill is of a lead colour,—"*couleur de plomb.*" —We know not how to reconcile this difference: but we mention the point more particularly, as the colour of the bill appears to us, judging at least from the specimens before us, to offer a strong mark of distinction between this bird and the next, the existence of which as a separate species has been much doubted.

The specimens in our museum were not among the birds originally collected by Mr. Caley. In that gentleman's Notes, however, we find the following observations, which we make no doubt apply to this species. "The natives tell me of another kind of *Cockatoo* (besides *Wyla* and *Geringora*), which they call *Carat'*. It is very shy. It scrapes dirt out of the hollow boughs, and makes its nest as the others do. It lays two eggs, the colours of which I did not ascertain. The nest is found by watching the bird into the hole. It does not make *Co'tora*, nor cut off the branches of the trees: but it cuts off *May'rybor'ro* and *Mun'mow* (the fruit of two species of *Persoonia*), without however eating them, before they are ripe, to the great injury and vexation of the natives." Mr. Caley has informed us, that he recollects having shot a bird soon after his arrival in the colony, which he believes to have been of the same species as the *Cal. Cookii* of the Society's collection. It differed from the *Wyla* and *Geringora* in having no yellow in its plumage. He also expresses his opinion that *Cal. Cookii* is the *Carat'* of the natives.

4. SOLANDRI? *C. niger, collo corporeque inferiori brunnescenti-nigris, rectricibus lateralibus medio coccineis nigro-fasciatis, rostro pallido.*

Psittacus Solandri? *Temm. Linn. Trans. vol.* xiii. *p.* 113.
Psittacus Temminckii. *Kuhl, Nova Acta &c. p.* 89. *no.* 162.
Solander's Cockatoo. *Lath. Gen. Hist.* ii. *p.* 201. *no.* 129.

In describing and giving a name to this bird M. Temminck expresses his doubts as to its being a distinct species, or the young of the preceding *C. Cookii;* and he clearly states the arguments on both sides the question. As far as we can judge, it seems probable that the birds will prove distinct. But this is a mere matter of fact, which we hope shortly will be ascertained: and as such we leave it to time, without indulging in conjecture.

5. GALEATUS. *C. cineraceus viridi-splendens, albido-variegatus, rectricibus albido fasciatim undulatis, cristâ maris coccineâ.*

Psittacus galeatus. *Lath. Ind. Orn. Supp. p.* xxiii. *no.* 13. *Kuhl, Nova Acta &c. vol.* 10. *p.* 88. *no.* 160.
Red-crowned Parrot. *Lath. Gen. Hist.* ii. *p.* 218. *no.* 152. *pl.* xxviii.

Subfam. PALÆORNINA.

Genus. NANODES*.

Rostrum breve culmine rotundato, altius quàm longum, generis *Macrocerci* rostro persimile; mandibulâ inferiori brevissimâ, introrsum inclinante, emarginatâ.

Alæ mediocres, subacuminatæ; *remigibus* primâ et secundâ ferè æqualibus longissimis, secundæ et tertiæ pogoniis externis apicem versùs leviter emarginatis.

Pedes mediocres; *tarsis digitis*que subgracilibus.

Cauda gradata, cuneata; *rectricibus* apicem versùs graciliоribus.

* *Νανωδης nanus.*

We

We have already observed, that no species of the subfamily *Macrocercina*, or the *Maccaws*, the next succeeding group to the subdivision of *Cockatoos* which we have just quitted, has been found in Australia. Neither has the recently-described genus *Psittacara*, V., or the *Perruche-Aras* of M. Le Vaillant, which connects the *Maccaws* with the present subfamily of *Palæornina*, been met with in that country. New Holland, however, supplies the next link in the chain of affinities; and in a singularly beautiful assemblage of birds, diminutive in their size, but brilliant and attractive in their plumage, affords the representatives of the New World *Macrocercus*. These birds, or the genus *Nanodes*, the characters of which we have given above, have the bill and general form of *Macrocercus;* and, with the exception of the naked cheeks, appear perfect *Maccaws* in miniature. The first species enumerated, *N. discolor*, may be considered the type of the group. The two last species will be found partially to deviate from this type, as we shall observe in its place, and to form the passage to the succeeding genus*.

1. Dis-

* The above group is as nearly allied to *Pezoporus* as to *Platycercus;* and it might perhaps, in a rude distribution of species, be included in that genus from a conformity in general appearance and habits. We are induced to keep it separate, in consequence of its close affinity to the *Maccaws*, and for the purpose of more strongly marking out, by such a generic separation, one of the intervening gradations by which the species of this extensive family are beautifully connected with each other. *Nanodes* with *Platycercus* and *Pezoporus* form a natural group, the species of which return into themselves in a circular succession; and they thus constitute a minor subdivision of the present subfamily. We take this opportunity of pointing out the other subdivisions with which it is connected. The subfamily of *Palæornina* comprises, first, the *Parrakeet Maccaws* of South America, or the genus *Psittacara*, V.; secondly, the present Australian group of *Ground Parrakeets*, including *Nanodes*, *Platycercus*, and *Pezoporus*, and connected with the preceding *Parrakeet Maccaws* by *Nanodes discolor;* thirdly, the Indian group of *Palæornis*, which is united with the *Ground Parrakeets* by means of the New Holland species *Pal. Barrabandi;* fourthly, the *Parrakeets* whose tongue is filamentous, such as the Australian and Indian genera *Trichoglossus* and *Lorius*, which join

1. DISCOLOR. *N. viridis; tæniâ frontali, gulâ, maculis pectoralibus abdominalibusque, tectricibus inferioribus, crissoque coccineis; capitis vertice, alulâ, pteromatibusque azureo-cæruleis; ptilis caudâque purpurascenti-ferrugineis.*

Psittacus discolor. *Lath. Ind. Orn. Supp. p.* xxi. *no.* 6.

Perruche Banks. *Le Vaill. Hist. des Perr. pl.* 50.

Red-shouldered Parrakeet. *White's Journ. pl. in p.* 263. *Phill. Bot. Bay, pl. in p.* 269. *Swains. Zool. Illust. pl.* 62. *Lath. Gen. Hist.* ii. *p.* 176. *no.* 90.

One of our specimens of this species was brought by Mr. Brown from the banks of the Derwent, where he obtained it in 1804. It appears to be the bird from which the late M. Kuhl took the description of his *Psittacus australis* (*p.* 48. *no.* 74). He refers to a specimen in the Linnean Society's collection, and there is no other bird in that collection which accords with his description. We do not observe any material difference between our specimen and the *Psitt. discolor* of Dr. Latham. The front is somewhat more yellow than is usual in the species; and when the bird is compared with M. Le Vaillant's figure, in which the front is pure scarlet, a slight difference appears, which may have given rise to M. Kuhl's separating the two birds. In most of the birds, however, which are considered to belong to M. Le Vaillant's species *Perruche Banks*, and Dr. Latham's *P. discolor*, a greater or less proportion of this yellow marking is discernible. M. Le Vaillant's figure appears to us too highly coloured. Mr. Swainson's is an excellent representation of the bird. There

join *Palæornis* by the osculant species *Pal. Papuensis;* and fifthly, the species of various countries, known by the general title of *Perruches proprement dits,* including *Brotogeris,* V., united to *Lorius* of the last subdivision by *Psitt. fringillaceus,* Lath., and leading round again to the first subdivision of *Parrakeet Maccaws* by some American species, whose bills gradually shortening, and becoming stronger, indicate an approaching affinity to that group.

seems

seems to be some confusion in respect to M. Kuhl's reference to *P. discolor* of the "*Index Ornithologicus.*" He refers that name to the *Perruche Latham* of M. Le Vaillant (*pl.* 62.), *Psitt. Lathami*, Bechst., an apparently distinct species; and he assigns the denomination of *Psitt. humeralis*, Bechst., to the *Psitt. discolor*, or *Red-shouldered Parakeet* of Latham, White, and Phillips.

2. Undulatus. *N. obscurè viridis fusco-variegatus, subtus pallidè viridis; capite, nuchâque flavescenti, fasciis perangustis fuscis undulatis; maculâ genarum azureâ; rectricibus cæruleo-viridibus, lateralibus fasciâ flavâ in medio notatis.*

Psittacus undulatus. *Shaw, Nat. Misc. pl.* 673. *Kuhl, Nova Acta &c. vol.* 10. *p.* 49. *no.* 76.

Undulated Parrot. *Lath. Gen. Hist.* ii. *p.* 179. *no.* 95. *pl.* 26.

3. Pulchellus. *N. viridis, subtus flavus; fronte, genis, tectricibusque lazulinis, remigibus azureis, rectricibus lateralibus flavis, humeris maris sanguineo-purpureis.*

Psittacus pulchellus. *Shaw, Nat. Misc. pl.* 96. *Kuhl, Nova Acta &c. vol.* 10. *p.* 50. *no.* 79.

Perruche Edwards. *Le Vaill. Hist. des Perr. pl.* 68. ♀.

Turcosine Parakeet. *Swains. Zool. Illust. pl.* 73. ♂. *Lath. Gen. Hist.* ii. *p.* 185. *no.* 104.

The bills of this species and of the next are in a slight degree more rounded at the *culmen* than that of the typical species *N. discolor*: the wings are also somewhat less acuminated, and the tail flatter and more rounded at the *apex*. In these particulars it evinces a gradual approach to the next genus, *Platycercus*. The birds of this latter genus are observed to feed upon the ground; and the two species now before us are generally found in a similar situation as we are informed by Mr. Caley.

But

But they are not equally well adapted to the ground as the species of *Platycercus*, not having an equal length of *tarsus*, or the same shortness and roundness of wing. The gradual approach, however, of the two genera, both in characters and habits, is singularly conspicuous.

Mr. Caley says of this species,—"The native name I have forgotten. The settlers call it *Ground Parrot*. It feeds upon the ground. Great care is required in taking off the skin, from its being particularly fine and thin, and readily torn. The crop is generally full of small grass-seeds; and should it be cut or torn, so as to let these seeds out among the feathers, it is with difficulty they are got off again, from their having become glutinous in the stomach. The natives tell me it chiefly breeds in a stump of a small *White Gum-tree*, making no other nest than of the decayed parts of the tree. It has eight young ones. The eggs are white without spots."

4. VENUSTUS. *N. olivaceo-viridis, subtus flavus, tæniâ frontali, tectricibus, rectricibusque lazulinis, harum apice, loris, periophthalmiisque flavis, remigibus nigris.*

Psittacus venustus. *Temm. Linn. Trans. vol.* xiii. *p.* 121.

Psittacus chrysostomus. *Kuhl, Nova Acta &c. vol.* 10. *p.* 50. *no.* 78. *tab.* 1.

Blue-banded Parakeet. *Lath. Gen. Hist.* ii. *p.* 188. *no.* 109.

Mr. Caley informs us that this bird is called by the settlers *Hobart Ground Parrot*. The native name he has not ascertained. Our male specimen was brought by that gentleman from Van Diemen's Land; the female was procured by Mr. Brown at King George's Sound.

Genus. PLATYCERCUS*.

Rostrum breviusculum, *mandibulâ* superiori rotundatâ dilatatâ, inferiori

* *Πλατυς latus*, and *κερκος cauda*.

inferiori brevi profundè emarginatâ, apice quadrato, myxâ convexâ glabrâ.

Alæ rotundatæ; *remige* primâ secundâ breviori, quintæ præcipuè æquali; secundâ et tertiâ longissimis: omnium, primâ exceptâ, pogoniis externis abruptè medium versùs emarginatis.

Cauda lata, depressa, subrotundata aut subgradata; *rectricibus* apice subrotundis.

Pedes; *tarsis* elevatis; *digitis* gracilibus, elongatis; *unguibus* longis, parum falcatis.

The chief difference between the typical species of this genus and those of the preceding, lies in the roundness and comparative shortness of the wing, and the elevation of the *tarsi* of the former. Other more minute distinctions may be also detected sufficient to separate the groups; such as the more rounded *culmen* of the bill of *Platycercus*, the breadth and depression of the tail; the abrupt emargination of the webs of the quill-feathers, &c.: but the former characters of the wings and *tarsi* are the most decisive, as indicating the greater developement of the characters of these neighbouring groups. These characters at once point out the terrestrial habits of *Platycercus*. And they not only show that the food of the birds of that genus is found upon the ground, but they evince their superior activity and greater freedom of action, when compared with the remaining groups of the family, whose gait is awkward and embarrassed, and who seem to possess no powers of motion on the ground. The species enumerated in this genus accord in general with the above characters taken from *Pl. Pennantii*, which may be considered the type; with the exception of *Pl. scapulatus*, or *King's Parrot*, which exhibits some slight deviation from the characters of the bill. This difference, however, is not of sufficient

sufficient importance to cause us to separate it from the group, with which it generally accords in habits and external appearance.

1. PENNANTII. *Pl. coccineo-sanguineus, dorso scapularibusque nigris coccineo-marginatis; gulâ tectricibus caudâque lazulinis, remigibus nigris lazulino-marginatis.*

Psittacus Pennantii. *Lath. Ind. Orn. p.* 90. *no.* 26.
Psittacus gloriosus. *Shaw, Nat. Misc. pl.* 53.
Psittacus splendidus. *Id. Lev. Mus. tab.* 7.
Perruche à large queue. *Le Vaill. Hist. des Perr. pl.* 78. *juv.*
Pennantian Parrot. *Phill. Bot. Bay, pl. in p.* 154. *White's Journ. pl. in p.* 174. *Lath. Gen. Hist.* ii. *p.* 131. *no.* 34.
Psittacus elegans. *Gmel.* i. *p.* 318. *no.* 59. *Kuhl, Nova Acta &c. vol.* 10. *p.* 55. *no.* 89.
Perruche à large queue. *Le Vaill. Hist. des Perr. pl.* 79.

"This species," says Mr. Caley, "is called by the natives *Dulang'* and *Julang'*. Like the *King's Parrot* (*Pl. scapulatus*), it is found in large flocks among the ripe Indian corn, both species being intermixed. It varies much in colour: but as the greater part of the flock is of the colour of the female, it may almost be taken for granted that they are young birds.—The natives tell me it makes its nest chiefly in the *Peppermint-tree* (*Eucalyptus piperita*), always in the body, but never in the boughs. Sometimes it enlarges the hole through which it enters. Year after year the same place is frequented for the purposes of incubation. It makes no nest but from the decayed parts of the tree. It has four young ones. The eggs are white.

"I have met with this bird in November in the most mountainous parts of the country: but I apprehend it leaves these parts in the winter."

2. FLA-

2. Flaviventris*. *Pl. nigro viridique varius, capite postico corporeque subtus flavescentibus, fronte coccineo, gulâ tectricibus rectricibusque lateralibus lazulinis, remigibus nigris lazulino-marginatis.*

Psittacus flaviventris. *Temm. Linn. Trans. vol.* xiii. *pp.* 116—118.
Psittacus Brownii. *Kuhl, Nova Acta &c. vol.* 10. *p.* 56. *no.* 90.
Perruche à large queue, *var.* *Le Vaill. Hist. des Perr. pl.* 80.
Van Diemen's Parrot? *Lath. Gen. Hist.* ii. *p.* 130. *no.* 33.

"This bird," Mr. Caley tells us, "was common at the settlement near Hobart Town in Van Diemen's Land. It is also met with, as I understand, in New Caledonia. I know nothing of its habits." Dr. Latham expresses a doubt whether his *Van Diemen's Parrot* is the same as M. Temminck's species. It appears to us that they are the same, and that the description of the *Sulphur-headed Parrot* (*Gen. Hist. p.* 133. *no.* 35.) appertains also to the same species.

3. Eximius. *Pl. nigro flavo viridique varius, collo pectore crissoque coccineis, gulâ albâ, tectricibus rectricibusque lateralibus lazulinis, remigibus nigris lazulino-marginatis.*

Psittacus eximius. *Shaw, Nat. Misc. pl.* 96. *Zool. of New Holl. t.* 1. *Kuhl, Nova Acta &c. vol.* 10. *p.* 54. *no.* 87.
Perruche omnicolore. *Le Vaill. Hist. des Perr. pl.* 28. 29.
Nonpareil Parrot. *Lath. Gen. Hist.* ii. *p.* 139. *no.* 41.

In Mr. Caley's MSS. are the following observations on this bird. "*Rosehill Parrot.*—So called from the name of the settlement

* M. Temminck originally gave the specific name of *flavigaster* to this bird (*Linn. Trans.* xiii. *p.* 116.); but as he himself subsequently referred to it (*p.* 118.) under the name of *flaviventris*, we have no scruple in adopting the latter title in preference to the former, which is obviously liable to objections.

tlement afterwards known by the name of Paramatta. The native name of the bird is *Bundullock*.

"The natives inform me it always breeds in dead trees, chiefly on farms, making its nest with feathers in the body of the hollow tree. To whatever depth the tree may be hollow, the bird always descends to the bottom, like an *Opossum*. Its nest is found by watching the old bird; and sometimes by hearing the young ones in the hollow of the tree on passing by. It has six young ones; the eggs are white without spots.

"It may frequently be seen in small flocks along with the *King's Parrot* (*Pl. scapulatus*) and the *Lory* (*Pl. Pennantii*) in fields of Indian corn: but I never recollect it taking the corn from the stalk like the other two birds, and I suspect it only picks up what the others throw to the ground. I have seen the most of this species on new-sown wheat early in the morning; but never in large flocks. I do not recollect ever to have seen the *King's Parrot* or *Lory* pulling up the young wheat like this bird. All three species are caught in traps. They are very good eating. The *King's* and *Rosehill Parrots* are the most valuable for selling to ships to take to England. This latter species (*eximius*) frequents Van Diemen's Land. I do not know whether the *Lory* does so, but I remember shooting that species at Western Port, on the opposite side of the strait."

4. BROWNII. *Pl. flavescenti-albidus, nigro variegatus; capite scapularibusque nigris, alis caudâque lazulinis, genis albis subtus cæruleo-marginatis, crisso coccineo.*

Psittacus Brownii. *Temm. Linn. Trans. vol.* xiii. *p.* 119.
Psittacus venustus. *Kuhl, Nova Acta &c. vol.* 10. *p.* 52. *no.* 83.
Brown's Parrot. *Lath. Gen. Hist.* ii. *p.* 139. *no.* 42.

This species, which may perhaps be considered, from the extreme delicacy of its colours, as the most beautiful of the family,

family, was discovered by Mr. Brown, whose name it justly bears, at Arnheim Bay.

5. Baueri. *Pl. viridis, capite nigro, torque nuchali abdomineque imo flavis, pteromatibus remigibusque lazulinis apicibus nigris, rectricibus lateralibus apice cæruleis.*

Psittacus Baueri. *Temm. Linn. Trans. vol.* xiii. *p.* 118.
Psittacus cyanomelas. *Kuhl, Nova Acta &c. vol.* 10. *p.* 53. *no.* 84.
Bauer's Parrot. *Lath. Gen. Hist.* ii. *p.* 120. *no.* 21.

The fine specimen of this species in the collection was met with by Mr. Brown at Memory Cove on the South coast.

6. Barnardi. Lath. MSS. *Pl. lætè viridis, fronte coccineo, fasciâ occipitali brunnescenti-fuscâ, dorso cærulescenti-nigro, torque nuchali interrupto flavo, genis pteromatum rectricumque apice lazulinis, humeris remigum margine rectricumque lateralium basi azureis.*

Barnard's Parrot. *Lath. Gen. Hist.* ii. *p.* 121. *no.* 23.

In honorem Edouardi Barnard, *Armigeri, Societatis Linneanæ Socii, Ornithologiæ studiosissimi, hæc species, quam Societas liberalitati ejus debet, nomen accipiat.*

7. Multicolor. *Pl. viridis, fronte humeris femoribus crissoque aurantiaco-flavis, fasciâ occipitali purpureo-brunneâ, pteromatibus remigibusque externè azureis.*

Psittacus multicolor. *Temm. Linn. Trans. vol.* xiii. *p.* 119. *Kuhl, Nova Acta &c. vol.* 10. *p.* 55. *no.* 88.
Varied Parrot. *Lath. Gen. Hist.* ii. *p.* 182. *no.* 98.

This bird was procured by Mr. Brown at Spencer's Gulf, South coast.

8. ERYTHROPTERUS. *Pl. viridis subtus flavescenti-viridis, dorso scapularibusque nigris, tectricibus coccineis, fasciâ dorsali lazulinâ.*

Psittacus erythropterus. *Gmel. Syst.* i. *p.* 343. *no.* 120. *Kuhl, Nova Acta &c. vol.* 10. *p.* 53. *no.* 85.

Psittacus melanonotus. *Shaw, Nat. Misc. pl.* 653.

Perruche érythroptere. *Quoy et Gaymard, Voy. aut. du Monde, pl.* 27.

Crimson-winged Parrot. *Lath. Gen. Hist.* ii. *p.* 253. *no.* 198.

A female of this species, presented to the Society by Mr. Brown, was obtained in an island of the Gulf of Carpentaria in December 1802.

9. SCAPULATUS. *Pl. viridis, capite collo corporeque subtus coccineis, lunulâ nuchali uropygioque lazulinis, lineâ scapulari longitudinali pallidè viridi-cæruleâ, rectricibus nigris viridi splendentibus.*

Fœm. *Capite pectoreque viridibus.*

Psittacus scapulatus. *Bechst. Kuhl, Nova Acta &c. p.* 56. *no.* 91.

Psittacus Tabuensis, *var.* β. *Lath. Ind. Orn. p.* 88. *no.* 19.

Grande Perruche à collier et croupion bleue. *Le Vaill. Hist. des Perr. pl.* 55. 56.

Tabuan Parrot. *White's Journ. pl. in p.* 168. ♂. *in p.* 169. ♀. *Phill. Bot. Bay, pl. in p.* 153.

Mr. Caley could not inform us of the native name of this bird. "It was seldom," he tells us, "that I noticed a full coloured specimen, viz. red. When the Indian corn is ripe they may be seen in large flocks, on the farms, clinging on the stalks, and occasioning much mischief to the corn. I apprehend that the greater part of these flocks are young birds, as it is rare to see a bright-red one among them.—The natives tell

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me it breeds chiefly in a *white Gum-tree* (a species of *Eucalyptus*), making its nest of a little grass, and lining it with feathers. It has as many as twelve young ones. The eggs are of a dirty-white with black specks. The nest is found by the bird enlarging the hole to creep in at. This process gives the surrounding part a reddish appearance, which, forming a contrast with the whiteness of the other parts, renders it conspicuous."

Genus. PEZOPORUS. *Ill.*

The birds of this genus, which was first characterized by M. Illiger, differ essentially from those of the last by the form of the tail, which, instead of being broad and depressed, is narrow and cuneated, and has the feathers pointed at the *apex*. The toes also seem even still more appropriated to the ground than those of *Platycercus*, being longer and straighter, and the nails being less falcated. The outer webs of the quill-feathers are less indented, and the indenture is nearer the *apex*; while the under mandible also exhibits a slighter emargination than in the latter genus, thus evincing a greater recession from the groups that approach the *Maccaws*. There has hitherto been but one species discovered of the genus, which appears confined to New Holland.

1. FORMOSUS. *P. viridis, capite nigro-lineato, dorso alis pectoreque maculis nigris lunulatis flavo-marginatis, corpore subtus rectricibusque flavo viridique fasciatis, tæniâ frontali coccineâ, remigum fasciâ interruptâ flavâ.*

Psittacus formosus. *Lath. Ind. Orn. p.* 103. *no.* 60. *Kuhl, Nova Acta &c. p.* 43. *no.* 64.

Psittacus terrestris. *Shaw, Zool. of New Holl. pl.* 3. *Nat. Misc.* 228. *Lev. Mus. tab.* 55.

Perruche ingambe. *Le Vaill. Hist. des Perr. pl.* 32.

Ground Parrot. *Lath. Gen. Hist.* ii. *p.* 137. *no.* 40.

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There was no specimen of this species in the collection originally brought to this country by Mr. Caley. That gentleman, however, makes the following reference to this bird, when speaking of the *N. pulchellus*. "What is called the *Ground Parrot* at Sydney inhabits the scrubs in that neighbourhood. I have also seen it in similar situations elsewhere. I have never seen it except on the wing; it having started up before me, taking a short flight, and alighting among the bushes, but never to my knowledge upon them."—Our specimen was obtained by Mr. Brown at Port Phillip, January 25th, 1804.

Genus. PALÆORNIS*.

Rostrum subcrassum; *mandibulâ* superiore dilatatâ, *culmine* rotundo: inferiore latâ, brevi, emarginatâ.

Alæ mediocres; *remigibus* tribus extimis ferè æqualibus, longissimis; secundæ tertiæ et quartæ pogoniis externis in medio gradatim latioribus.

Cauda gradata; *rectricibus* duabus mediis gracillimis, cæteras longitudine magnoperè excedentibus.

Pedes; tarsis brevibus, debilibus; *unguibus* mediocribus, subgracilibus, falcatis.

Corpus gracile, concinnum.

The birds of this genus, which are of peculiar interest as having formed the group of *Parrots* known to the ancients, are distinguished at once from those of the conterminous genera by the form of the tail, in which the two middle feathers considerably exceed the others in length. Other distinguishing characters may also be observed on comparing the generic descriptions. The group belongs chiefly to India, and some of the neighbouring islands in the Indian Ocean. One species only has been found in New Holland. This seems to possess

* *Παλαιος antiquus*, and *ορνις avis*.

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the general characters of *Palæornis;* but the *tarsi* are more elongated than is usual in the genus. In this aberration of character we may trace a beautiful connection between the *Ground Parrakeets* of Australia, and the more typical birds of the present genus belonging to the continent of India.

1. Barrabandi. *Pal. viridis, sincipite gulâque aureo-flavis, torque pectorali maculisque femoralibus coccineis.*
Psittacus Barrabandi. *Swains. Zool. Illust. pl.* 59.
Scarlet-breasted Parrot. *Lath. Gen. Hist.* ii. *p.* 121. *no.* 24.

Genus. Trichoglossus*.

Rostrum subelongatum, compressiusculum: *mandibulâ* inferiori subrectâ, margine integrâ, longiori quàm altâ.
Lingua setis plurimis marginalibus ad apicem subtus instructa.
Alæ mediocres; *remige* primâ longissimâ, secundâ et tertiâ paulò brevioribus, pogoniis integris.
Pedes subbreves; *tarsis* plumis femoralibus aliquatenus opertis; *acrotarsiis* infra genu paululum plumosis; *digitis* subfortibus, depressis, lomatinis; *unguibus* fortibus, falcatis.
Cauda gradata; *rectricibus* apice angustioribus.

Besides the external characters, specified above, which separate this genus from the rest of the present subfamily, a decided ground of distinction is exhibited in the formation of the tongue. The under part of this member is furnished at the *apex* with numerous strong hairs or bristles, of a brush-like structure; and which seem to serve the bird for the purposes of suction. The tendency of a considerable portion of the birds of New Holland to feed by suction upon vegetable juices, for which a sufficient provision is made by nature in the luxuriant vegetation and the constant succession of flowers in that country, ren-

* θριξ *seta*, and γλωσσα *lingua*.

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ders this singular deviation from the general form of the *Parrot's* tongue less surprising. Our characters of the tongue are drawn from a specimen belonging to a species of this genus, which was for some time alive in this country: and our inferences concerning its use are strongly confirmed by the observations of Mr. Caley on the manners of some species, extracts from which will accompany our descriptions of the birds. It is to be remarked, that although the *Parrots* are in general a long-lived race, and of all birds perhaps the most easily reared, and although the birds of the present group are most numerous in New Holland, few of them have been kept alive for any length of time in a state of confinement. Ignorance most probably of their natural mode of feeding has occasioned this difficulty in rearing them.

We have reason to believe that the next adjoining group of the present subfamily, the genus *Lorius* of the Eastern Islands, is endowed with a similar formation of tongue. These two united groups include some of the birds which exhibit the most elongated and the weakest bills in the family: and the deviation evinced from the general mode of feeding of the family confirms our conjectures that the birds which are distinguished by such characters of the bill are the most aberrant in the group; while the birds which possess the opposite characters, viz. strength and shortness of bill, are the most typical. It is also to be observed, that the next allied group of the Order of *Insessores* which adjoins the *Parrots*, and to which the two aberrant genera at present before us approach most nearly of all that family, is distinguished by the tongue entirely superseding the general functions of the bill in procuring sustenance. The partial use of the tongue in these two genera of *Psittacidæ*, thus affords an addition to the numberless beautiful instances in which nature blends together the characters of her conterminous groups.

1. HÆ-

1. Hæmatodus. *Tri. viridis, capite collo abdomineque medio purpurascenti-azureis; pectore coccineo flavo-variegato, tectricibus inferioribus coccineis, lúnulâ nuchali fasciâque remigum subtus flavis.*

Fœm.? *Pectore coccineo, azureo-fasciato.*

Psittacus hæmatodus. *Linn. Mant.* 1771. *p.* 524.
Perruche des Moluques. *Pl. Enl.* 743.
Perruche d'Amboine. *Ib.* 61. ♀.
Perruche à tête bleue. *Le Vaill. Hist. des Perr. pl.* 24. ♂. 25. ♀. 26. *juv.* 27. *var.*
Blue-bellied Parrakeet. *Brown, Illust. of Zool. pl.* 7. *Phill. Bot. Bay, pl. in p.* 152.
Red-breasted Parrot. *Lath. Gen. Hist.* ii. *p.* 122. *no.* 26.

Mr. Caley informs us, that "this bird is called *War'rin* by the natives, and by the settlers *Blue Mountain Parrot*. The young birds of this species are taken by the natives, who sell them to the settlers inhabiting the banks of the Hawkesbury, and the neighbourhood of Richmond Hill; which latter settlement being situated at the foot of the mountains, the above name has been given to the bird. The name however is misapplied, for this species does not frequent the mountains; at least I have never met with it there during the various times and the different seasons that I visited those parts. It is a bird remarkable for its docility and attachment to some people, although a perfect scold to others, who may have teazed or offended it.—Flocks of these birds may be seen in the *Eucalypti* trees when in flower, in different parts of the country, but in the greatest number near their breeding-places. It does not eat any kind of grain, even when in a domesticated state. It is much subject to fits, which generally prove fatal; and it is rare to find an individual kept alive above a couple of years. One that I kept, on being

shown a figure of a coloured plant, used to put its tongue to the flowers, as if with the intent of sucking them: and I have seen it make the same attempt with a piece of cotton furniture. The flesh of this bird is very good eating."

Although, according to general custom, we have referred our New Holland birds of this species to the *Psitt. hæmatodus* of Linnæus, we have strong doubts as to their being the same species. It is not, however, in our power at present to make any decisive observations on this point, as we have not been able to procure a sufficient number of authentic specimens of the Molucca birds, from whence Linnæus's original description was taken, to compare with our Australian specimens. We have also to add, that a bird agreeing with the above description of the female of this species, which we have marked with a note of doubt, was brought from New Holland, and presented to the Society as the female of the *Blue Mountain Parrot*. This bird accurately accords with M. Le Vaillant's figure of the female of the *Perruche à tête bleue*. We are of opinion, however, that it will prove to belong to a very distinct species. Mr. Caley, whose observations on the spot were most accurate, informs us that he noticed little difference in plumage between the sexes of the *Blue Mountain Parrot*. And among hundreds of skins of this species, which have come under our own observation, we have never seen a second specimen agreeing with the bird to which we allude. It is not probable that one sex should be so common in the collections sent home to this country, and the other sex, equally attractive in plumage, be so extremely rare.

2. CAPISTRATUS. *Tri. viridis, pileo gulâque purpurascenti-azureis, pectore coccineo-aurantio, tectricibus inferioribus coccineis, torque nuchali fasciâque remigum subtus flavis.*

Psittacus

Psittacus capistratus. *Bechst. Kuhl, Nova Acta &c. vol.* 10. *p.* 35. *no.* 44.
Perruche à face bleue. *Le Vaill. Hist. des Perr. pl.* 47.

3. Rubritorquis. *Tri. viridis, capite genis gulâque cæruleis, pectore tectricibus inferioribus torqueque nuchali aurantio-coccineis, hoc azureo-variegato, maculâ abdominali azureo-viridi, fasciâ remigum subtus abdomineque infimo flavis.*

Caput totum cæruleo-splendens. *Torquis* nuchalis plumæ coccineæ, ad apicem azureo-marginatæ. *Remigum* pogonia interna fusca, maculâ longâ longitudinali marginata. *Femorum caudæ*que tectrices flavæ, viridi variæ. *Rectrices* virides, subtus flavescenti-virides, pogoniis internis, mediis exceptis, ad basin flavo-marginatis. Longitudo *corporis*, $9\frac{7}{10}$; *mandibulæ* superioris ad rictum, $\frac{4}{5}$, inferioris, $\frac{11}{20}$; *alæ* a carpo ad remigem primam, $5\frac{7}{10}$; *tarsi*, $\frac{11}{20}$; *digiti* antici externi, ungue incluso, $1\frac{1}{6}$.

This species approaches very nearly to the two preceding; but it may at once be distinguished from them by the colour of the nuchal collar, which is scarlet, with the feathers margined by deep blue. The colour of the head is of a paler azure, and that of the breast and inner wing-coverts is more of an orange and less of a scarlet than in *Trich. hæmatodus*.

4. Matoni. Lath. MSS.* *Tri. viridis, pectore abdomine nuchâque flavo coccineoque variis, tectricibus inferioribus fasciâque remigum subtus coccineis.*

* There is a species described by M. Kuhl in his Monograph on this family (*Psitt. chlorolepidotus, p.* 48. *no.* 75.), which he refers to as being in the Linnean Society's collection, and which bears some resemblance in characters to the present species. The description, however, is not sufficiently accordant with our bird to lead us at once to conclude that it is intended for it. The species described above is extremely common, and in every extensive collection.

Capitis pileus viridis, cæruleo splendens: *gula*, *genæ*que cærulescenti-virides. *Pectoris*, *abdominis* medii, *nuchæ*que plumæ ad basin flavæ, coccineo parcè variegatæ, fasciâ apicali viridi latâ marginatæ. *Remigum* pogonia interna fusca, omnium, primâ exceptâ, maculâ aurantio-coccineâ in medio notata, his maculis fasciam subtus formantibus. *Rectrices* virides, subtus pallidè fuscæ, pogoniis internis omnium, duabus mediis exceptis, ad basin aurantiaco-coccineis. *Rostrum* rubro-flavum. *Pedes* nigri. Longitudo *corporis*, $9\frac{3}{10}$; *alæ* a carpo ad remigem primam, $5\frac{1}{20}$; *mandibulæ* superioris ad rictum et ad ceram, $\frac{3}{5}$, inferioris, $\frac{1}{2}$; *tarsi*, $\frac{3}{5}$; *digiti* antici externi, *ungue* incluso, $\frac{9}{10}$.

Spotted Parrot. *Lath. Gen. Hist.* ii. *p.* 197. *no.* 123.

In honorem GULIELMI MATON, *Medicinæ Doctoris, Societatis Linneanæ* PRO-PRÆSIDIS, *in Zoologiâ eximii judicis, hæc species pulchra generis pulcherrimi nomine distinguatur.*

5. CONCINNUS. *Tri. viridis; fronte, tæniâ postoculari descendente, rectricumque basi intus coccineis; occipite cærulescente, maculâ laterali subtus flavâ; nuchâ interscapulioque olivaceis.*

Psittacus concinnus. *Shaw, Nat. Misc. pl.* 87. *Kuhl, Nova Acta &c. vol.* 10. *p.* 46. *no.* 70.

Psittacus australis. *Lath. Ind. Orn. p.* 104. *no.* 66.

Perruche à bandeau rouge. *Le Vaill. Hist. des Perr. pl.* 48.

Crimson-fronted Parrakeet. *Lath. Gen. Hist.* ii. *p.* 181. *no.* 97.

"This species," Mr. Caley observes, "is called by the natives *Coolich*. It may be observed in large flocks sucking the *Eucalypti* flowers. Like the *Blue Mountain Parrot* it is subject to fits, which generally prove fatal. It is but seldom kept alive. Its breath, or some part about its head, emits a very sweet odour.

"The

"The natives tell me it breeds in the hollow boughs of trees, scraping out the decayed mould and making its nest of it. It has two young ones. The eggs are green without spots."

6. Pusillus. *Tri. viridis; fronte, gulâ, regione rostrali, rectricumque basi intus coccineis; lunulâ nuchali olivaceo-brunneâ, interscapulio olivaceo-viridi.*

Psittacus pusillus. *Lath. Ind. Orn. p.* 106. *no.* 71. *Kuhl, Nova Acta &c. vol.* 10. *p.* 47. *no.* 71.

Perruche à face rouge. *Le Vaill. Hist. des Perr. pl.* 63.

Small Parrakeet. *White's Journ. pl. in p.* 262. *Lath. Gen. Hist.* ii. *p.* 194. *no.* 118.

"The native name of this bird is *Jerryang*'. This, like *Coolich*, is seen in very large flocks in the *Eucalypti* trees when in blossom. The natives now and then bring in the young ones, but they seldom live long. I had three young ones for some time, which used to huddle together and give out a very pleasing note. They all died strongly convulsed, and nearly at the same time; the limbs were as stiff the moment life was extinct, as if the body had become cold.—The natives tell me it builds in the hollow limbs of trees, making no other nest than of the decayed wood. It has four young ones. The eggs are white and without spots."—*Caley's MSS.*

Mr. Caley adds, "that he has learned from the natives that the nest of this species, of the *Ground Parrot* (*N. pulchellus*), of the *Dulang*' (*Pl. Pennantii*), and of the *Coolich* (*Tri. concinnus*), smell very strong and offensive of their dung."

Fam. Certhiadæ.

The true *scansorial birds* have been very sparingly found in New Holland. Hitherto no species of the family of *Picidæ* has been discovered in that vast continent; and of the present family

family of *Certhiadæ* a few Australian species only have as yet been sent home to us. It is however to be observed, that a neighbouring family to the present, that of the *Meliphagidæ*, of which a considerable variety of forms and a number of species occur in Australia, possesses one of the grand characteristics of the *scansorial birds*, a strong and lengthened *hallux*. And it consequently becomes a question whether these birds, distinguished by such a peculiarity which separates them from all the other *honey-eating birds* of the Old and the New World, may not for the most part supply the place of the more typical *climbing birds* in that fifth division of the globe. The peculiar vegetation of the country, which seems to unite to so great an extent the strength of the forest-tree with the blossoms of the shrub, serves in some measure to strengthen such a conjecture, and to account for this singular union of characters, as administering at once to the purposes of the birds which represent the *scansorial* and *mellivorous* tribes.

The following genus, which holds the same place in Australia as the true *Certhia* fills in the ancient continent, and the numerous group of *Dendrocolaptes*, Herm., in South America, is the first which presents itself of this family. It possesses the strong and lengthened shafts of the tail-feathers which support the typical *scansorial* birds in climbing, and immediately connects the whole group by a strong affinity with the *Woodpeckers*.

ORTHONYX. *Temm.*

1. TEMMINCKII. *Orth. rufo-brunneus; capite, regione nuchali, interscapulioque nigro-variegatis; tectricibus nigris apice albido; gutture, pectore, abdomineque medio albis.*

Caput rufo-brunneum nigro-lineatum, strigâ laterali oculos includente griseâ. *Guttur* parcè nigro undulatum. *Nucha interscapulium*que strigis latis nigris notatæ; illius lateribus

bus maculis nigris ad pectus ferè extendentibus utrinque instructis. *Remiges* fusco-brunneæ, pogoniis externis basi albis, deinde fasciâ fusco-nigrâ notâque ferrugineâ approximante instructis: subtus, *tectrices*que inferiores, brunnescenti-fuscæ. *Rectrices* brunneæ, rhachibus nigris; subtus brunnescenti-fuscæ. *Rostrum* nigrum. *Pedes* pallidè fusci.

Longitudo *corporis*, $7\frac{1}{10}$; *alæ* a carpo ad remigem quintam, $3\frac{11}{20}$; *caudæ*, $3\frac{3}{4}$; *rostri* ad frontem, $\frac{1}{2}$, ad rictum, $\frac{4}{5}$; *tarsi*, $1\frac{1}{5}$.

In honorem Ornithologici celeberrimi, Domini C. J. Temminck, *Societatis Linneanæ Socii Peregrini, qui primùm hoc genus characteribus illustravit, hæc species nominatur.*

M. Temminck in his "*Manuel*" refers to a species which he gives as the type of this genus, and which he describes as dark-brown above with black spots, the male having a red throat surrounded with black; the female with a white throat. We suspect our bird to be the female of this species. M. Temminck has not named his bird; and we consequently take this opportunity of assigning it the name of a naturalist, to whom we are indebted for the characters of the group itself, and for many other valuable additions to Ornithology.

The Society's specimen was presented to them by Mr. Brown, who met with it near Hat Hill in the year 1804.

Genus. Climacteris*. *Temm.*

1. Picumnus. *C. fusco-griseus, alis maculâ humerali albidâ, remigibus maculis mediâ ferrugineâ subapicalique fusco-nigrâ fasciatis; subtus pallidior, abdomine strigis albidis fusco-marginatis lineato.*

* I take this opportunity of correcting an error in the 14th volume of these Transactions (p. 459.), where I stated that the tail-feathers of the birds of this genus were rigid, like those of the true *Certhia*. They are soft and pliant, as in the generality of birds.—V.

Certhia

Certhia picumnus. *Ill.*
Echelet picumne. *Temm. Pl. Col.* 281. *f.* 1.

Mr. Caley informs us that "this bird is met with in the scrubs at Paramatta, and may be seen running swiftly up the bodies of trees, crying out *pink*, *pink*, like the *Fringilla cœlebs* of Europe. Its *irides* are dark hazel-brown."

2. SCANDENS. *C. fusco-brunneus; remigibus fuscis, maculis mediâ ferrugineâ subapicalique fusco-nigrâ fasciatis; gutture pectoreque albis, illo maculâ ferrugineâ postauriculari; abdomine nigro, albo-strigato; rectricibus griseis, in medio nigro-fasciatis.*
Fœm. *Gutture albo, immaculato.*
Climacteris scandens. *Temm.*
Echelet grimpeur. *Id. Pl. Col.* 281. *f.* 2.

The two specimens in the collection were shot together by Mr. Caley, running up a *tea-tree*. Their *irides* were light hazel-brown. M. Temminck informs us that the female is without the ferruginous spot behind the ears.

Genus. SITTA. *Linn. et Auct.*

1. CHRYSOPTERA. *S. cinerea, subtus albida; alis caudâque nigro-fuscis, remigibus aurantio-ferrugineo in medio fasciatis, tectricibus inferioribus maculâ albâ notatis, uropygio rectricumque apicibus albis.*
Sitta chrysoptera. *Lath. Ind. Orn. Supp. p.* xxxii. *no.* 1.
Orange-winged Nuthatch. *Id. Gen. Hist.* iv. *p.* 77. *no.* 20. *pl.* 63.

This species of *Nuthatch*, Mr. Caley informs us, is not unfrequent among the small trees about Paramatta. The *irides* are cream-coloured.

The

The species of the Linnean group of *Sitta*, although few in number, appear to be found in all parts of the globe. They exhibit little differences among themselves in general characters. Our New Holland species perhaps deviates from the type of the genus, if we consider the *S. Europæa* of Linnæus to hold that rank, more than any other species of the group. Its bill is more slender, and its wings more acuminated. The second quill-feather is nearly as long as the third, fourth, and fifth, which are almost equal, and it is longer than the sixth; whereas in the European species the same feather is much shorter than the third, and also falls short of the sixth. The Javanese species, *S. frontalis*, Horsf., approaches our bird most nearly in respect to these characters of the bill and wings. While the North American bird, *S. Carolinensis*, Briss., has nearly the same formation of wing as our species, but has the stronger and more lengthened bill of the European bird.

Fam. Cuculidæ.

Genus. Cuculus. *Linn. et Auct.*

* Alis acuminatis, caudâ longiori, tarsis brevibus plumis tibiarum tectis.

1. Inornatus. *C. cinereus, subtus pallidior, rectricibus fasciis albis utrinque denticulatis.*

Fœm.? *Saturatiori-cinerea; nuchâ, torqueque pectorali interrupto fusco ferrugineo-luteo variegatis; tectricibus albo et ferrugineo-luteo parcè notatis.*

Alæ maculâ longitudinali humerali notatæ. *Remiges* fasciis albis, usque ad tertiam partem longitudinis suæ, internè marginatæ. *Tectrices* inferiores albidæ. *Rectrices* utrinque maculis albis denticulatæ. *Rostrum* nigrum, basi pallidum. *Pedes* pallidi. Longitudo *corporis*, $12\frac{1}{5}$; *alæ* a carpo

ad remigem tertiam, 8; *caudæ*, $6\frac{1}{2}$; *rostri* ad frontem, $\frac{4}{5}$, ad rictum, $1\frac{3}{2\,0}$; *tarsi*, $\frac{3}{4}$.

Mr. Caley marks the two birds described above as male and female of the same species, and we have accordingly given them as such. "The earliest period of the year," he remarks in his Notes, "at which I have met with this species at Paramatta, was September 6th, 1803. I have missed it in January. It may be frequently heard and seen on the tops of dead trees on the skirts of the woods, and such as have been left standing on the cleared ground."

2. ALBO-STRIGATUS. *C. brunnescenti-cinereus, albo-strigatus, remigibus rectricibusque utrinque albo-denticulatis.*

*Frons gula*que pallidè brunnescentes. *Capitis, dorsi, scapularum*que plumæ basi pallidè cineraceæ, apice marginibusque albæ, in medio fusco-brunneæ. *Tectrices* superiores apice albo, maculâ longitudinali humerali notatæ; inferiores albidæ. *Remiges*, primâ exceptâ, pogonio externo maculis albidis marginatæ; omnes, pogonio interno fasciis albidis denticulatæ, apicibusque albo-marginatæ. *Rectrices* utrinque fasciis albis denticulatæ, fasciis internis grandioribus. *Rostrum pedes*que flavi. Longitudo *corporis*, $11\frac{7}{1\,0}$; *alæ* a carpo ad remigem tertiam, $7\frac{3}{1\,0}$; *caudæ*, $6\frac{1}{1\,0}$; *rostri* ad frontem, $\frac{3}{5}$, ad rictum, $1\frac{1}{1\,0}$; *tarsi*, $\frac{1\,3}{2\,0}$.

3. CINERACEUS. *C. capite dorso gulâque cineraceis, corpore subtus tectricibusque inferioribus ferrugineis, rectricibus fusconigris utrinque albo-denticulatis.*

Fœm. *abdomine transversim fusco-undulato.*

Alæ maculâ longitudinali humerali albâ. *Remiges* brunnnescenti-cineraceæ; pogoniis internis maculâ albâ in medio notatis, fasciam albam, remigibus clausis, subtus exhibentibus.

tibus. *Tectrices* inferiores ferrugineæ. *Rectrices* cineraceo-nigræ, apicibus albo-maculatæ; duæ externæ albo-fasciatæ; cæteræ utrinque marginibus albo-denticulatæ; tertia maculis tribus albis, quarta maculâ unicâ albâ in medio notatæ. *Rostrum* nigrum; *mandibulâ* inferiore basi pallidâ. *Pedes* flavi. Longitudo *corporis*, $10\frac{3}{10}$; *alæ* a carpo ad remigem tertiam, $5\frac{2}{5}$; *caudæ*, $5\frac{1}{5}$; *rostri* ad frontem, $\frac{3}{5}$, ad rictum, $\frac{9}{10}$; *tarsi*, $\frac{9}{20}$.

Barred-tailed Cuckoo? *Lath. Gen. Hist.* iii. *p.* 310. *no.* 65.

4. Incertus. *C. brunnescenti-cineraceus, subtus ferrugineo-albido fasciatus; tectricibus inferioribus albidis fusco-fasciatis; rectricibus maculis ferrugineis utrinque margine denticulatis.*

Gula gutturque fuscæ, albido-maculatæ. *Pectus* ferrugineo-albido fasciatum. *Abdomen* albido-fasciatum. *Alæ* maculâ humerali longitudinali albâ notatæ. *Remigum* pogonia interna maculâ sordido-albâ in medio notata, fasciam sordido-albam, alis clausis, subtus efformantia. *Tectrices* inferiores albidæ, fusco-fasciatæ. *Rectrices* ferrugineo, dentium more, ad margines maculatæ; externæ pogonio interno fasciâ albâ denticulato. *Pedes* fusco-flavi. Longitudo *corporis*, $9\frac{1}{2}$; *alæ* a carpo ad remigem tertiam, $5\frac{3}{10}$; *caudæ*, $5\frac{1}{5}$; *rostri* ad frontem, $\frac{3}{5}$, ad rictum, 1; *tarsi*, $\frac{3}{5}$.

Mr. Caley in his Notes seems to consider this bird as the young of the last species. It differs much in the ground-colour of the upper parts, and in the *fasciæ* of the lower; while the spots on the tail are ferruginous instead of being white. These however are differences which may be easily supposed to take place in the different stages of growth: our own *Cuckoo* differs nearly as much in its early and adult ages. But there is one character in which the two birds before us differ, and which is

seldom found to vary at different times in the same species; that is, the colour of the under wing-coverts. These are ferruginous in *C. cineraceus*, and white fasciated with fuscous in the bird now before us. We are therefore inclined to keep the birds separate, until future observation in their own country determine the point; expressing at the same time Mr. Caley's and our own doubts on the subject.

* Alis rotundatis, caudâ breviori, tarsis magis nudis elongatisque.

5. VARIOLOSUS. *C. fusco-cineraceus pallido-ferrugineo variegatus, subtus albescens fusco-variegatus; rectricibus pallido-ferrugineo utrinque denticulatis, apice albo.*

Caput fusco-cineraceo et pallido-ferrugineo strigatum. *Dorsum tectrices*que pallido-ferrugineo maculatæ. *Scapulares* eodem colore fasciatæ. *Remiges* fusco-cineraceæ, tæniâ gracili pallido-ferrugineâ prope apicem marginatæ; pogoniis internis in medio albo-maculatis, maculis, remigibus clausis, fasciam albam subtus efformantibus. *Corpus* subtus albidum: *gula gutturque* pallido-ferrugineo fuscoque variegatæ; *pectus abdomen femorumque tectrices* fusco-fasciatæ. *Rectrices* externæ pallido-ferrugineo fasciatæ, fasciis apicalibus in albúm vergentibus; cæteræ maculis pallido-ferrugineis utrinque denticulatæ. *Rostrum pedes*que pallidè flavi. Longitudo *corporis*, 7; *alæ* a carpo ad remigem tertiam, $4\frac{3}{5}$; *caudæ*, $3\frac{4}{5}$; *rostri* ad frontem, $\frac{1}{4}$, ad rictum, $\frac{7}{10}$; *tarsi*, $\frac{3}{5}$.

The specimen now described has much the appearance of a young bird; and we find that Mr. Caley in his Notes seems to think it belongs to our two last species, which we have already stated that he fancied were the same. Upon inquiring, however, further

further from that gentleman, we find that his suspicions were founded merely on the circumstance of his having met with all these birds in the same place and at the same period. Although we have some doubt respecting our *C. incertus* being a distinct species, we have little respecting the present bird, which seems to belong to a different section of the genus from that in which the preceding species are included. The wings are shorter and more rounded, the tail also shorter and less graduated, and the *tarsi* are more naked and more elevated. There are six or seven species of *Cuculus* belonging to Australia and Africa, which form part of the same section of the group, and which differ from the bird before us only in their colours being bright and metallic. It is the want of these colours chiefly that causes us to consider the specimen before us as a young bird. In its general structure it has the characters of the birds to which we allude, and which in their young state are also without the shining tints of the adult birds, although perhaps not so decidedly so as our present species.

Mr. Caley informs us that he met with the three last-described species in the neighbourhood of Paramatta. They frequented the *green wattle-trees* which were of low growth. They made their appearance on the approach of winter; and it was Mr. Caley's opinion that they migrated southerly at the commencement of spring.

6. Lucidus. *C. cupreo-viridi nitescens, subtus albidus cupreo-viridi fasciatus, abdomine medio albo; rectricibus externis maculis albis quatuor utrinque notatis.*

Fœm.? *virescenti-fusca, subtus albida irregulariter fusco-fasciata.*

Cuculus lucidus. *Gmel. Syst.* i. *p.* 421. *no.* 47.

Shining Cuckow. *Lath. Gen. Hist.* iii. *p.* 299. *no.* 49. *pl.* 56.

Coucou éclatant. *Temm. Pl. Col.* 102. *f.* 1.

Mr.

Mr. Caley met with these birds but sparingly, and after the interval of some years. He conjectured that the period of their migration into the colony was not regular, or that few arrived. The species was first discovered in New Zealand, whence they probably migrate into the adjoining continent.

7. METALLICUS. *C. suprà viridi-cupreus, subtus albus viridi-brunneo fasciatus; rectricibus externis maculis albis quinque utrinque notatis.*

*Caput genæ*que saturatiores. *Gula, corpus* subtus, *tectrices*que inferiores albæ, viridi-brunneo fasciatæ. *Remigum*, tribus primis exceptis, pogonia interna in medio albo-notata, fasciam albam obliquam, alis clausis, subtus exhibentia. *Rectrices* externæ maculis quinque albis, ferrugineo parcè variegatis, utrinque notatæ: secundarum pogonia interna fasciis alternis fusco-nigris ferrugineisque instructæ; cæteræ, mediis exceptis, leviter eodem more notatæ; mediæ fasciâ fuscâ vix conspicuâ prope apicem notatæ. *Rostrum pedes*que nigri. Longitudo *corporis*, $6\frac{3}{10}$; *alæ* a carpo ad remigem tertiam, $3\frac{9}{10}$; *caudæ*, $2\frac{19}{20}$; *rostri* ad frontem, $\frac{3}{5}$, ad rictum, $\frac{4}{5}$; *tarsi*, $\frac{13}{20}$.

The chief difference between this bird and the preceding species lies in the colours of the upper parts inclining more to a metallic red than to green, in the head and adjacent parts being more saturated, and the *fasciæ* on the *abdomen* being less brilliant; while the marks of the tail-feathers also are distinct. In *C. lucidus* the outer feathers have four white spots on each barb, while in the present species they have five white spots marked with ferruginous. The other tail-feathers of the latter bird are also alternately fasciated with fuscous and ferruginous, while those of *C. lucidus* are free from spots, except a single fuscous

fuscous band near the *apex*. We have met with many specimens of *C. lucidus*, all of which accorded in these markings with the bird in our collection: but we have not seen any other specimen of the *C. metallicus* besides the bird before us. This bird differs also from *C. chalcites*, Ill., which has been described as a New Holland *Cuckoo*, in having the *abdomen* fasciated, which in both sexes of the other bird is pure white and free from markings*.

Genus. EUDYNAMYS†.

Rostrum crassum, subelongatum, *culmine* rotundato, a basi arcuato, lateribus subcompressis: *mandibulâ* superiore apice subemarginatâ, inferiore gonyde ascendente conspicuâ: *naribus* subgrandibus, patulis, ovalibus, subobliquè positis, suprà membranâ partim tectis.

Alæ subbreves, rotundatæ; *remigibus* tertiâ quartâ et quintâ ferè æqualibus longissimis, primâ brevi undecimæ æquali; pogoniis integris.

Pedes robusti, nudi; *acrotarsiis* ad latus externum compressissimis, in scuta quatuor grandia divisis; *paratarsiis* in medio compressis, in scutula plurima divisis.

Cauda elongata, patula, rotundata.

The true *Cuckoos*, or that portion of the present family of *Cuculidæ* which constitutes the genus *Cuculus*, Auct., is distinguished from the remaining groups of the family by the comparative weakness of the bill, in which the *nares* are small and rounded, and situated on an elevated membrane; by the wings being strongly acuminated, the primary quill-feathers considerably exceeding the secondary in length; and by the feebleness of the legs and toes, the former of which are plumed beneath the knee, and are generally covered by the thigh-

* See *Temm. Pl. Col.* 102. *f.* 2.

† *Eu bene*, and δυναμις *potentia*.

feathers.

feathers. The group which we have just characterized deviates from these characters, which may be considered typical in the family, by the greater strength of all these members. The bill is powerful, the under mandible more particularly, which is marked by a strong ascending *gonys*. The nostrils are wide and oval, and covered only on the upper part by a membrane. The *tarsi* and feet are particularly strong: the former are much compressed on the external side, exhibiting by this conformation a nearly flattened surface in front. The wings also are much rounded, and comparatively shorter than in the typical *Cuckoos*. In many of these particulars the group agrees very nearly with the neighbouring genera *Centropus*, Ill., and *Phænicophaus*, Vieill., which have equally been separated from the typical species of the family. But it may at once be distinguished from *Centropus* by the absence of the lengthened nail to the *hallux*; and it will be seen equally to differ from *Phænicophaus* in its stronger, shorter and less arcuated bill; in the wings being longer, and the tail rounded, not graduated. The compressed formation of the sides of the *tarsi* in our group is also wanting in *Phænicophaus*. The species of this genus seem very widely distributed over the East. The *Cuculus punctatus*, Linn., the *Coucou tacheté des Indes Orientales* (*Pl. Enl.* 771.), appears to be referable to this group.

1. ORIENTALIS. *Eud. metallicè niger, rostro flavescente.*
Cuculus orientalis. *Linn.* i. 168. *no.* 2.
Coucou des Indes Orientales. *Pl. Enl.* 274. *f.* 1.
Eastern black Cuckoo. *Lath. Gen. Hist.* iii. *p.* 282. *no.* 26.
Fœm. *suprà nitidè virescenti-fusca albo-maculata, rectricibus albo-fasciatis; subtus albida, virescenti-fusco transversim undulata.*
Cuculus Mindanensis. *Linn.* i. 169. *no.* 3.

Coucou

Coucou tacheté de Mindanao. *Pl. Enl.* 277.
Mindanao Cuckoo. *Lath. Gen. Hist.* iii. *p.* 283. *no.* 27.

These birds, which now generally are considered the sexes of one species, appear to be but accidental visitors in the colony. At least Mr. Caley informs us that he never met with more than two individuals of the male and one of the female. The male specimen in the Society's collection seems to be a young bird changing to the adult plumage. It has several pale ferruginous feathers on the lower parts of the body, and it has a single ferruginous feather striated with black among the secondary quill-feathers of the right wing, which forms a striking contrast with the deep black of the rest. The corresponding feather on the left wing was lost, as Mr. Caley tells us, by the shot striking the wing. This bird had berries of *Cassytha* in its stomach. The native name of the male is *Cowhat'*; of the female, *Bellinging*.

2. Flindersii. Lath. MSS. *Eud. suprà brunnescenti-fusco nitescens ferrugineo-luteo variegatus, capite ferrugineo-luteo, sincipite strigâque pone subtusque oculos nigro-nitescentibus; subtus ferrugineo-luteus, fasciis gracilibus fuscis undulatus.*

Caput ferrugineo-luteum; sincipite, strigâ postoculari ad scapulares descendente, strigâque suboculari gulam utrinque marginante nigro-nitescentibus. *Dorsum, scapulares*que nitidè brunnescenti-fuscæ, ferrugineo-luteo parcè punctatæ fasciatæque. *Tectrices* fasciis latis ferrugineo-luteis notatæ. *Remiges* utrinque ferrugineo-luteo fasciatæ, fasciis internis apice albidis. *Rectrices* lunulis ferrugineo-luteis fasciatæ. *Gula, pectus, abdomen, femorum tectrices, uropygium*que ferrugineo-luteæ, fasciis gracilibus parcè undulatæ. *Rostrum, pedes*que fusci, illo apice pallido. Longitudo *corporis*,

ris, 16; *alæ* a carpo ad remigem tertiam, $8\frac{1}{2}$; *caudæ*, $8\frac{1}{2}$; *rostri* ad frontem, $\frac{4}{5}$, ad rictum, $1\frac{3}{10}$; *tarsi*, $1\frac{1}{5}$.

Flinders's Cuckoo. *Lath. Gen. Hist.* iii. *p.* 308. *no.* 63.

Genus. CENTROPUS. *Ill.*

1. PHASIANUS. *Cent. rufo flavo nigroque variegatus: capite, collo, gulâ, jugulo, pectore, abdomineque nigris; caudâ nigrâ supra fasciis albidis interruptis punctatâ.*

Cuculus phasianus. *Lath. Ind. Orn. Supp. p.* xxx. *no.* 4.
Polophilus phasianus. *Leach, Zool. Misc. pl.* xlv.
Pheasant Coucal. *Lath. Gen. Hist.* iii. *p.* 240. *no.* 2.

2. VARIEGATUS. *Cent. rufo flavo nigroque variegatus; dorso posticè nigro; caudâ nigrâ suprà transversim variegato-fasciatâ.*

Polophilus variegatus. *Leach, Zool. Misc. tab.* li.
Variegated Coucal. *Lath. Gen. Hist.* iii. *p.* 250. *no.* 15.

Fam. RAMPHASTIDÆ.

Genus. SCYTHROPS. *Lath.*

1. NOVÆ HOLLANDIÆ. *Scyth. suprà plumbeo-cinereus, capite collo corporeque subtus pallidè griseis; caudâ fasciâ latâ nigrâ subapicali, apice albo.*

Scythrops Novæ Hollandiæ. *Lath. Ind. Orn. p.* 141.
Psittaceous Hornbill. *Phillips, Bot. Bay, pl. in p.* 165.
Anomalous Hornbill. *White's Journ. pl. in p.* 142.
Scythrops présageur. *Temm. Pl. Col.* 290.
Australasian Channel-Bill. *Lath. Gen. Hist.* ii. *p.* 300. *pl.* 32.

The native name of this bird is *Curriay'gun*. The specimen in the Society's collection was shot by Mr. Caley in the woods at a short distance from Paramatta. He was directed to it by a native who discovered the bird, of which Mr. Caley was long in search, by its loud screaming noise. The same native informed him

him that the bird was only seen in summer, that he knew nothing of its nest, but that it fed upon figs at the Flats. These birds had also been pointed out by the natives to Mr. Caley in their flight; at which time he observed them very high in the air, and wheeling about with great swiftness. That gentleman adds, that the present individual had two large caterpillars and some of the *gold beetles* (*Anoplognathus viridi-æneus*, &c., Leach) in its stomach at the time he shot it. Seeds of the *red gum* and *peppermint* trees have also, as we are informed*, been found in the crops of these birds. Like the South American genera *Ramphastos* and *Pteroglossus*, which in conjunction with the present group compose the family of *Ramphastidæ*, they may probably be considered to be omnivorous.

Tribus. Tenuirostres. *Cuv.*

Fam. Meliphagidæ.

The chief groups which compose the *tenuirostral* Tribe of the *Insessores*, or that assemblage of birds which derive their main nourishment from the suctorial powers of their tongue, are distinguished not only by their geographical distribution, but by striking peculiarities which point out their greater or less accordance with the typical characters of the Tribe. The most prominent indication of typical pre-eminence among them is exhibited in the superior developement of those organs or powers which contribute to the purposes of feeding by suction on the wing, and the consequent deficiency of those members which are suited for functions of a different nature. And in determining the different stations of the various groups of the Tribe, we are thus guided to the central or typical assemblage by detecting the superior powers of flight exhibited in the wings and tail, and the accompanying weakness of the bill and legs.

* See *Latham's Gen. Hist.* ii. *p.* 301.

In these characteristic peculiarities of the *Tenuirostral Birds*, the *Trochilidæ* or *Humming-Birds* of America display the greatest perfection. In them the wing is long, strongly acuminated, and formed for a rapid and constant flight. The tail also exhibits all the varieties of structure which we are accustomed to observe in those birds whose habits are aërial. On the other hand, the bill is feeble, and apparently of service only in forming a sheath to defend the tongue. The legs also are diminutive, and peculiarly weak, apparently of little use but to assist the bird in supporting itself when at rest; while the characteristic delicacy of those members conspicuously unfolds itself by the downy plumage descending from the thighs, with which covering nature seems to have provided them as a means of warmth and defence.

The nearest approach to the *Humming-Birds* is found in the *Cinnyridæ* of the Old World. A line of distinction, however, is drawn between the two families by the comparatively greater strength of conformation in both the bill and legs of the latter group. The wings also, although still formed for a suspended flight, lose the strongly-marked length and acumination of those of the *Trochilus*: they are more rounded, and the first quill-feather is short, almost indeed spurious. We do not observe, moreover, that varied form of the tail which adds apparently so much to the purposes of flight among birds: in some species, indeed, the middle tail-feathers are elongated beyond the lateral, but hitherto we have seen no approach to the forked conformation. These two families however, although they may thus be distinguished from each other, may yet be united together as forming the *Normal Group* of the Tribe. In comparison with the remaining families which form the *Aberrant* subdivision of it and lead off to other neighbouring Tribes, they possess a generally weaker conformation; and their mode of taking

their

their food, unlike that of the other families, is represented as being exclusively on the wing. By the brilliancy again, and varying lustre of their colours, these "gay creatures of the element" evince their separation from the neighbouring groups, and indeed from every other race of birds, of which the manners are less aërial than their own, and the food less sublimated than the nectar of flowers.

In the New World again, a third group appears, the family of *Nectariniadæ*, in which a comparative strength of bill and legs is exhibited, nearly equal to that which is found in many of the more typical species of the *Insessores*. The wings are generally shorter than those of the *Cinnyridæ*, and differ in their structure also from them, the first quill-feather being long, almost equalling the second in length, while that of the Old World family is short, and, as before observed, nearly spurious. The tail in all the species we have met with is even. These birds, distinguished by their stronger conformation from those of the *Normal Group*, are distinguished also by their habits. They do not feed exclusively on the wing, but explore the nectaries of flowers as they hop from branch to branch*. By their colours also they may be set apart from the typical families. These, although in most species bright and vivid, are decided colours, and not changeable in different lights.

In addition to these groups Australia furnishes another important accession to the *Tenuirostres*. No species of the beforementioned groups has hitherto been found in that country; and their place seems to be occupied by a group of considerable extent, which preserve the same habits of feeding on vegetable juices, but deviate from the typical character of the Tribe even still further than the *Nectariniadæ*. In the birds to which I allude, or the family of *Meliphagidæ*, the wings and tail show an evident deficiency in the powers of flight, compared with

* See these *Transactions, vol.* xiv. *p.* 464.

the

the *Trochilidæ*. The former members are short and rounded, the four first quill-feathers gradually exceeding each other in length, and those which succeed by degrees decreasing. The tail also in the typical species of the family is long and graduated. On the other hand, the *tarsi* and feet are endowed with much strength, and the powers of the hind-toe in particular are conspicuously developed. We have already observed the great deficiency of true climbing birds which prevails in New Holland; and this peculiarity of the strong scansorial *hallux* may enable the *Meliphagidæ* in some measure to supply that deficiency. The prevalence also of this character, which they hold in common with the neighbouring family of *Certhiadæ*, with which they are also united by the character of the extensile tongue, points out the continuance of the chain of affinities which connects the neighbouring Tribes of *Scansores* and *Tenuirostres* together; and adds another to the numberless instances of the harmonious disposition of nature.

Besides the characters which thus indicate that the *Meliphagidæ* are placed at the extremity of the Tribe of *Tenuirostres*, there are one or two particulars which separate them from the more typical *Honey-feeding* groups. Their tongue is divided at the *apex* into several filaments; while that of the *Trochilidæ* is bifid only at the end. We have not at present sufficient *data* to determine the general character of the tongues of the other *Tenuirostral* families, and shall therefore make no comparison with them on a point on which we could speak only partially. One more character must be observed as peculiar to our New Holland group. The *nares*, which in all the other families of the tribe are situated at the base, and are more or less rounded, are here longitudinal and linear, forming a lengthened slit extending in some instances nearly to half the length of the bill, and partially closed above by a longitudinal membrane. This character prevails so far in the family as to be almost the only

external

external mark of distinction which separates some of the more slender-billed species from the conterminous species of the *Cinnyridæ*.

In addition to the numerous species of this family which decidedly exhibit most of its typical characters, and which in their general slenderness of form coincide with the other groups of the *Tenuirostres*, there are many species, in which great size and strength of form is discernible, which have been ranked as *Meliphagous* in consequence of the alleged filamentous conformation of their tongue. Many of these, from their external characters, might be referred at once to the powerfully constructed groups of *Corvidæ* and *Merulidæ*. Of some of these species we can say with confidence that they are *Meliphagous*, from our having examined the tongue. But we have much doubt as to a similar construction of tongue existing in all the species. We consider it, however, the most eligible plan to enumerate all these species at the end of the present family; stating our doubts on the subject, and leaving the question to be decided by those naturalists who may have the opportunity of inspecting the birds in their native haunts.

Genus. MELIPHAGA*. *Lewin et Auct.*

* Caudâ rotundatâ, rostro longiori subgraciliori.

1. NOVÆ HOLLANDIÆ. *Mel. nigra, subtus alba nigro-striata; superciliis maculâque aurium albis, remigibus in medio externè flavo-*

* The species of the family of *Meliphagidæ* appear very numerous, and every arrival from New Holland and the Australian islands brings an addition to their number. At the same time the species themselves are but ill-defined; and in the present imperfect state of our knowledge, and while information is daily increasing, we consider it unadviseable to attempt more than a rude sketch of this interesting family. The group which we have selected above as representing the *Meliphaga* of Lewin and Authors,

flavo-marginatis, rectricibus basi externè flavis, apice internè albo-maculatis.

Certhia Novæ Hollandiæ. *Lath. Ind. Orn. p.* 296. *no.* 49.

New Holland Creeper. *White's Journ. pl. in p.* 186. ♂. 297. ♀. *Lath. Gen. Hist.* iv. *p.* 171. *no.* 17.

Heorotaire tacheté. *Vieill. Ois. dor.* ii. *p.* 91. *pl.* 57.

Mr. Caley thus observes on this species.—"This bird is most frequently met with in the trees growing in scrubs, where the different species of *Banksia* are found, the flowers of which I have reason to think afford it a sustenance during winter. In the summer I have shot it when sucking the flowers of *Leptospermum flavescens*. In the scrubs about Paramatta it is very common."

M. Vieillot's *Heorotaire noir* (*pl.* 71.), which seems accurately

Authors, is the only assemblage of these birds of which we can speak with any satisfaction to ourselves. The species accord in their general characters; and in their habits and the structure of their tongue they are represented as agreeing most perfectly. They exhibit five prominent modifications of form, according to the variation chiefly of the characters of the bill and tail. At present we wish to consider these types of form as sections only of the group, which we name provisionally the genus *Meliphaga*. When the species become more known, the present sections may justly be considered genera, and the higher group may be denominated the subfamily *Meliphagina*. When this subdivision takes place, the section which stands first in our text may be considered the true *Meliphaga*. The *Mel. Novæ Hollandiæ* will form the type. It may thus be characterized.

Genus. MELIPHAGA. *Lewin et Auct.*

Rostrum subgracile, subelongatum; *culmine* arcuato, ad basin subcultrato; *naribus* longitudinalibus, linearibus, perangustis, membranâ suprà tectis, rostri medium longitudine superantibus.

Lingua ad apicem setis plurimis instructa.

Alæ mediocres, subrotundatæ; *remige* primâ brevi, secundâ tertiâ et quartâ quæ est longissima gradatim longioribus; tertiâ et quintâ, secundâ et sextâ æqualibus: tertiæ ad septimam inclusam pogoniis externis in medio latioribus.

Cauda subelongata, rotundata.

Pedes subfortes; *halluce* subelongato, forti; *acrotarsiis* scutellatis.

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to agree with the female of this species figured in *White's Journal*, is considered by that gentleman as a distinct species. This is a point which can only be decided on the spot; and Mr. White's observations must have great weight until they are proved to be incorrect. We mention the circumstance, in order that those voyagers, who may have opportunities of making observations on the subject, may pay attention to it. We suspect that the investigation may lead to the discovery of many distinct species in the group, in which a great similarity of colouring seems to prevail.

2. Australasiana. *Mel. nigricans; strigâ superciliari, abdomine, gulâque albis, hâc graciliter fusco-striatâ; remigum rectricumque pogoniis externis in medio flavis.*

Certhia Australasiana. *Shaw, Gen. Zool.* viii. *p.* 226.

L'Heorotaire noir et blanc? *Vieill. Ois. dor.* ii. *p.* 89. *pl.* 55.

This seems a very distinct species. We do not feel quite certain that it accords with M. Vieillot's bird, although his figure is referred to by Dr. Shaw.

3. Melanops. *Mel. fusca; fronte, abdomineque albis; fasciâ suboculari ad latera pectoris extendente utrinque nigrâ.*

Certhia melanops. *Lath. Ind. Orn. Supp. p.* xxxvi. *no.* 4.

Heorotaire mellivore. *Vieill. Ois. dor.* ii. *p.* 124. *pl.* 86.

White-fronted Honey-Eater. *Lath. Gen. Hist.* iv. *p.* 173. *no.* 20.

This bird was caught on board ship by Mr. Brown, off the South coast of New Holland, February 5th, 1802.

** Caudâ rotundatâ, rostro subbreviori, subfortiori.

4. Auricomis. *Mel. olivaceo-viridis; vertice, corpore subtus, maculâque paroticâ flavis; strigâ per oculos nigrâ.*

Muscicapa auricomis. *Lath. Ind. Orn. Supp. p.* xlix. *no.* 1.
Heorotaire à oreilles jaunes. *Vieill. Ois. dor.* ii. *p.* 123. *pl.* 85.
Tufted-eared Honey-Eater. *Lath. Gen. Hist.* iv. *p.* 197. *no.* 56.

Mr. Caley first observed this species in some high trees in the neighbourhood of Paramatta; but did not meet with it for many years afterwards. The birds however frequented the trees in the brush along the upper part of Duck River, in great abundance, although it was at a late period of his residence in the colony that he met with them at that place. He imagines that their coming to Paramatta when he first saw them was accidental.

5. CHRYSOTIS. *Mel. suprà olivaceo-viridis, subtus pallidior, capite grisescente, maculâ auriculari ovali flavâ, regione periophthalmicâ nigrescente.*

Meliphaga chrysotis. *Lewin, Birds of New Holl. pl.* 5.
Certhia chrysotis. *Lath. Ind. Orn. Supp. p.* xxxviii. *no.* 16.
Heorotaire gris? *Vieill. Ois. dor.* ii. *p.* 122. *pl.* 84.
Yellow-eared Honey-Eater. *Lath. Gen. Hist.* iv. *p.* 195. *no.* 54.

We have some doubt as to this species being the same as that of M. Vieillot: the blackish marking round the eye in our species being wanting in the figure in the "*Oiseaux dorés.*"

6. LEUCOTIS. *Mel. corpore suprà abdomineque flavo-olivaceis; capite, gutture, pectoreque nigricanti-griseis; maculâ auriculari albâ.*

Turdus leucotis. *Lath. Ind. Orn. Supp. p.* xliv. *no.* 26.
White-eared Honey-Eater. *Id. Gen. Hist.* iv. *p.* 186. *no.* 41.

One of the specimens of this species in the Society's collection was procured by Mr. Brown at Shoalwater Bay in 1802. The species, as well as the next, are noticed by Mr. Caley as being by no means uncommon: but he has made no remarks upon their manners.

*** Caudâ

*** Caudâ æqualī, rostro breviori, fortiori*.

7. Chrysops. *Mel. suprà olivaceo-fusca, subtus pallidior; tæniâ per oculos flavâ, suprà subtusque nigro-marginatâ.*

Sylvia Chrysops. *Lath. Ind. Orn. Supp. p.* liv. *no.* 5.

Black-cheeked Honey-Eater. *Id. Gen. Hist.* iv. *p.* 196. *no.* 55.

8. Lunulata. *Mel. viridi-olivacea, capite genisque nigris; lunulâ nuchali corporeque subtus albis, orbitis nudis rubris.*

Certhia lunulata. *Shaw, Gen. Zool.* viii. *p.* 224.

Le Fuscalbin. *Vieill. Ois. dor.* ii. *p.* 95. *pl.* 61.

Red-eyed Honey-Eater. *Lath. Gen. Hist.* iv. *p.* 203. *no.* 65.

"This bird," Mr. Caley says, "is called *Golden-Eye* by the settlers. I shot it at Iron Cove, seven miles from Sydney, on the Paramatta road."—Specimens of the species now in the collection were brought by Mr. Brown from Port Jackson.

9. Indistincta. *Mel. suprà olivaceo-fusca, subtus sordidè albida, remigibus flavescentibus.*

This bird, which was found by Mr. Brown at King George's Sound, on the South coast of New Holland, appears closely allied to the last. It is however in very bad condition, and scarcely admits of a description. The dimensions appear nearly the same as those of *Mel. lunulata*. It has much of the appearance of a young bird.

10. Brevirostris. *Mel. brunnescenti-fusca, subtus albida, dorso virescenti, strigâ postoculari albâ, rostro subbrevi.*

* This section of our group corresponds with the genus *Melithreptus* of M. Vieillot; at least the *Mel. lunulata*, one of the best known species in the section, is given as one of the types of that genus. We do not know how far M. Vieillot meant to extend his group; but it may be adviseable hereafter to restrict it to those species which will arrange themselves in the present section.

Remiges fuscæ, subtus pallidiores, basi internè albescentes. *Tectrices* inferiores fulvescenti-albidæ. Longitudo *corporis*, $4\frac{17}{20}$; *alæ* a carpo ad remigem quartam, $2\frac{17}{20}$; *caudæ*, $2\frac{1}{5}$; *rostri*, $\frac{9}{20}$; *tarsi*, $\frac{3}{5}$.

This bird is said to be common by Mr. Caley, and to be called *Cung'leer* by the natives.

**** Caudâ æquali, rostro breviori, graciliori*.

11. CARDINALIS. *Mel. nigra; capite, dorso medio, uropygio, gutture, pectore, abdominisque lateribus coccineis; tectricum marginibus, abdomine imo, crissoque albis.*

Certhia Cardinalis. *Gmel.* i. *p.* 472. *no.* 38.
Certhia Australasiæ? *Leach, Zool. Misc.* i. *pl.* 11.
Le Souï-manga rouge et gris. *Vieill. Ois. dor.* ii. *p.* 58. *pl.* 36.
Cardinal Honey-Sucker. *Lath. Gen. Hist.* iv. *p.* 199. *no.* 59. *pl.* 71. *fig.* 2.

Mr. Caley informs us that he did not himself meet many birds of this species, although he understood them to be plentiful: his not meeting them probably arose, as he says, from their being inhabitants of brushes. His researches were chiefly in

* This section forms an interesting subdivision of the present group, as marking the passage to the *Cinnyridæ*. When the species become more known, and the whole group becomes too numerous for remaining as a single genus, this type of form may be generically characterized as follows, the *Mel. cardinalis* being the normal species.

Genus. MYZOMELA.

Rostrum breve, gracile; *culmine* arcuato, ad basin subcultrato; *naribus* longitudinalibus, linearibus, perangustis, membranâ suprà tectis, rostri tertiam partem longitudine æquantibus.
*Lingua, alæ, pedes*que iidem ferè ut in *Meliphagis* veris.
Cauda subbrevis, æqualis.

Several new species of *Honey-Eaters*, lately brought home to this country from the Sandwich Islands by Capt. Lord Byron, R.N., appear to accord with this group.

the

the forest scrubs, where his specimens were procured. The colonists call this bird *Little Soldier*.

This division of the group of *Meliphaga* is that to which we have alluded above as offering few external marks of distinction from many of the *Cinnyridæ*, besides the form of the nostrils.

***** Caudâ æquali, rostro graciliori, longiori.

12. Tenuirostris. *Mel. suprà cinerea; abdomine crissoque ferrugineis; regione interhumerali, maculâque jugulari sub-lunulari brunneis; capite, pectoris lateribus, rectricibusque nigris; harum duarum externarum apicibus, gutture, juguloque albis.*

Certhia tenuirostris. *Lath. Ind. Orn. Supp. p.* xxxvi. *no.* 5.

Le Cap-noir. *Vieill. Ois. dor.* ii. *p.* 94. *pl.* 60.

Slender-billed Honey-Eater. *Lath. Gen. Hist.* iv. *p.* 194. *no.* 52. *pl.* 72.

Mr. Caley observes that he has seen this bird both at Sydney and at Paramatta.

13. Fulvifrons. *Mel. pallidè brunnescenti-fusca; tæniâ superciliari, gutture, pectore, abdomine medio, crissoque albis; fronte fulvo; strigâ per oculos, pectorisque lateribus brunneis.*

Var.? *sincipite canescente.*

Striga brunnea per oculos extendit regionem paroticam includens, et ad latera pectoris descendens, ubi fasciam lunularem brunneam interruptam ferè efformat. *Interscapulium* brunneo-fuscum, pallido-fusco parcè striatum. *Remiges* brunneo fuscæ externè albido graciliter marginatæ, pogoniis internis ad basin fulvo-marginatis: subtus pallidè fuscæ, fulvo, ut supernè, notatæ. *Tectrices* inferiores fulvæ. *Rectrices* brunneo-fuscæ, subtus pallidè fuscæ. *Rostrum, pedes*que nigri. Longitudo *corporis*, $5\frac{17}{20}$; *alæ* a carpo ad remigem quartam, 3; *caudæ*, $2\frac{4}{5}$; *rostri*, $\frac{7}{10}$; *tarsi*, $\frac{7}{10}$.

One

One of the specimens of this species in the collection was brought by Mr. Brown from Port Jackson, where he met with it in August 1803. The species comes very near the first subdivision of this genus, having a stronger bill, and rather more elongated toes than the birds of the present section. The shape of its tail however, which is even, retains it in its present situation, but at that extreme of the section which joins the first subdivision, and completes the circular succession of the whole group.

This species bears some resemblance to M. Vieillot's *Heorotaire brun* (*pl.* 65.), the *Certhia fusca*, Gmel.; but it is differently marked on the throat and lower body; and as it belongs to a different locality it may be considered distinct.

Genus. MYZANTHA*.

Rostrum forte, subbreve, subrectum, ad apicem compressum, *culmine* carinato, paululum arcuato; *naribus* linearibus, anticè ovalibus, membranâ suprà tectis, ad basin plumulis confertis opertis; *mandibulâ* superiori leviter emarginatâ.

Alæ mediocres, subrotundatæ: *remige* primâ brevi, secundâ duplò longiore, tertiâ paulò breviore quartâ et quintâ, quæ sunt æquales longissimæque omnium.

Pedes mediocres; *acrotarsiis* scutellatis, *paratarsiis* integris.

Cauda subelongata, subrotundata.

Obs. *Orbitæ* nudæ.

This group approaches very nearly to the shorter- and stronger-billed birds of *Meliphaga*, such as *M. auricomis*, Lath.; but the bill is considerably stouter at the base and less arcuated. The *nares* also are not so linear, but become slightly oval towards the anterior part. The space round the eye is naked. We are assured that the tongue of the first species is bristly towards the point:

* *Μυζαω sugo*, and *ανθος flos*.

point: and indeed the general character of the group accords exactly with that of the *Meliphagidæ* in general.

1. Garrula. *Myz. grisea, fronte corporeque subtus albidis, nuchâ pectoreque leviter albo et cinereo fasciatis, pileo genisque nigris, strigâ longitudinali alarum flavâ, remigibus rectricibusque nigro-fuscis apicibus albis.*

Merops garrulus. *Lath. Ind. Orn. Supp. p.* xxxiv. *no.* 9.
Chattering Honey-Eater. *Id. Gen. Hist.* iv. *p.* 164. *no.* 9.

"The native name of this bird," observes Mr. Caley, "is *Cobay'gin*;—it is a very common bird, and may be seen at all times of the year. Its note is loud, and like a kind of laugh. I once killed six of these birds at a shot, when on the wing hovering over a part of a tree whence some substance had exuded; but they are not gregarious."

2. Flavirostris. *Myz. olivaceo-viridis, subtus flavescens; macula utrinque anteoculari flavâ; fronte, plumulis capistralibus, tæniâque rictali saturatè brunneis; tectricibus alarum griseis.*

Remiges fuscæ, exteriores pallido-griseo, interiores flavo-viridi externè marginatæ; subtus cinereo-fuscæ. *Tectrices* inferiores cinereo-fuscæ, ad humeros flavescentes. *Rectrices* supernè olivaceo-virides, subtus flavescentes. *Rostrum pedes*que flavi. Longitudo *corporis*, $8\frac{1}{2}$; *alæ* a carpo ad remigem quartam, $3\frac{17}{20}$; *caudæ*, $3\frac{7}{20}$; *rostri* ad frontem, $\frac{11}{20}$, ad rictum, $\frac{7}{10}$; *tarsi*, 1.

Mr. Caley thus observes on this bird.—"*Dell-bird* or *Bell-bird*. So called by the colonists. It is an inhabitant of brushes, where its disagreeable noise (disagreeable at least to me) may be continually heard; but no where more so than on going up the harbour to Paramatta, when a little above the Flats."

Genus.

Genus. ANTHOCHÆRA*.

Rostrum elongatum, subattenuatum, subarcuatum; *culmine* ad basin subcarinato; *mandibulâ* superiori vix emarginatâ; *naribus* longitudinalibus, linearibus, membranâ suprà tectis, ad medium rostrum extendentibus ibique apertioribus.
Lingua ad apicem in setas plurimas divisa.
Alæ mediocres, rotundatæ; *remige* primâ brevi secundâ tertiâ parte longiori, tertiâ gradatim longiori, quartâ quintâ et sextâ æqualibus longissimis; tertiæ ad septimam inclusam pogoniis externis in medio gradatim latioribus.
Cauda elongata, rotundata, vix gradata.
Pedes fortes, longitudine mediocres; *acrotarsiis* scutellatis, *paratarsiis* integris.

The strong, but at the same time lengthened and attenuated bill of this group, added to the size and powerful conformation of the species, distinguish it from the true *Meliphaga*. The lengthened and subgraduated tail also serves as a strong mark of distinction. The chief external characters of the group associate it with the *Meliphagidæ*, although upon a decidedly enlarged scale; and the tongue of one of the species, now before us, exhibits the filamentous formation peculiar to the Australian *Honey-Eaters*. The genus is closely allied to the last; the same general character pervades them: but the bill of the present genus is longer and slenderer, and the tail lengthened and somewhat graduated instead of being even, as in *Myzantha*. There is a general similarity of colours throughout the group, which has led, as we suspect, to several species being confounded together under one denomination.

M. Vieillot has referred this bird to a new genus of his, which he names *Creadion*, and which he divides into two sections; one

* *Ανθος flos*, and *χαιρω gaudeo*.

represented

represented by the *Sturnus carunculatus*, Gmel., the other by the bird before us. He places this genus in the vicinity of the *Sturnidæ;* uniting it with one or two other forms, which are chiefly distinguished by fleshy processes from their heads, into a family under the name of *Carunculati*. As we consider our present group to have no relation to the *Sturnidæ* beyond the unimportant analogical one of having in common with two or three species carunculated appendages to the head, we have no hesitation in removing it from the genus *Creadion;* leaving the *Sturnus carunculatus* (with which species however we must confess that we are unacquainted) to represent that group.

1. Carunculata. *Anth. dorso fusco-griseo albo-striato, capite corporeque subtus albidis fusco-striatis; abdomine medio flavescente; remigibus rectricibusque fusco-nigris, apicibus albis, illis in medio internè pallidè castaneis; lateribus colli carunculâ cylindriceâ instructis.*

Merops carunculatus. *Lath. Ind. Orn. p.* 276. *no.* 20.
Corvus paradoxus. *Id. Ib. Supp. p.* xxvi. *no.* 10.
Pie à pendeloques. *Daud. Traité d'Orn.* ii. *p.* 246. *pl.* 16. *no.* xxx.
Wattled Bee-Eater. *Phill. Bot. Bay, pl. in p.* 164. *White's Journ. pl. in p.* 144. ♂. 145. ♀.
Wattled Honey-Eater. *Lath. Gen. Hist.* iv. *p.* 158. *no.* 3.

"All my specimens of this bird," says Mr. Caley, "were shot in Van Diemen's Land. I have met with it at Western Port in the trees close to the sea-side. To my knowledge it never occurred about Sydney, although it is said by Mr. White to be an inhabitant of the colony."

2. Mellivora. *Anth. fusco nigra supernè subvirescens, albo striata lunulataque; remigum rectricumque apicibus albis, istarum pogoniis internis in medio lætè castaneis.*

Certhia mellivora. *Lath. Ind. Orn. Supp. p.* xxxvii. *no.* 8.
Le Goruck? *Vieill. Ois. dor.* ii. *p.* 126. *pl.* 88.
Mellivorous Honey-Eater. *Lath. Gen. Hist.* iv. *p.* 161. *no.* 5.

Mr. Caley informs us that he called "this bird *Cookaycock*, from its uttering a sound like that word. The natives call it *Coke'ran*. It now and then may be seen in the scrubs about Paramatta, always on trees; but it is common in the neighbourhood of Sydney. It is what I should call an inhabitant of the coast. I have met with it at Western Port."

3. PHRYGIA.* *Anth. nigra, supernè flavo, infrà albo variegata; crisso albo; remigibus rectricibusque, harum duabus mediis exceptis, externè flavis.*

Meliphaga Phrygia. *Lewin, Birds of New Holl. pl.* 3.
Merops Phrygius. *Lath. Ind. Orn. Supp. p.* xxxiv. *no.* 7. *Shaw, New Holl. Birds, p.* 13. *pl.* 4.
Le Merle ecaillé. *Le Vaill. Ois. d'Afr.* iii. *pl.* 116.
Black-and-yellow Honey-Eater. *Lath. Gen. Hist.* iv. *p.* 165. *no.* 10.

Genus.

* We take this opportunity of characterizing the following bird, which has been generally considered the young of *Anth. carunculata*, but which appears to us to be distinct. Besides some strong marks of difference in the colours of the two birds, which appear too decided to indicate the difference merely of age, the shape of the caruncle affords a strong ground for separation. In our bird this appendage to the cheeks is short, flat, compressed, and suboval. In *Anth. carunculata* it is long, narrow and cylindric. The difference between the two birds is much too great to allow us to refer them to one species, without authentic proof of their identity. Our bird resembles the description of *Merops chrysopterus*, Lath.; but that bird is said to have no caruncle on the cheeks, and to have the markings on the wings of a golden-orange colour.

4. LEWINII. *Anth. suprà fusco-grisea albido-striata, capite nigrescente albido striatim lineato; subtus pallidior, abdomine flavescente; remigibus rectricibusque fuscis*

Genus. TROPIDORHYNCHUS*.

Rostrum forte, subelongatum, *culmine* elevato, maximè cultrato, arcuato; *mandibulâ* superiori ad apicem vix emarginatâ; *naribus* prope medium sitis, subovalibus, apertis, perviis.

Alæ longitudine mediocres, subrotundatæ; *remige* primâ brevi, secundâ tertiâ parte longiori, tertiâ quartâ et quintâ æqualibus longissimis, sextâ his paulo breviori.

Cauda subelongata, æqualis.

Pedes fortes, longitudine mediocres; *acrotarsiis* scutellatis, *paratarsiis* integris.

Caput plus minusve nudum.

The strong bill, with its elevated keel, and the nostrils oval, pervious, and situated near the middle of the beak, offers a very distinguishing character by which this group is known from the more typical *Meliphagidæ*. We know not upon what authority they are said to be *Honey-Eaters;* but the above-mentioned form and situation of the *nares* are so different from what is

fuscis ad apices albis, istis in medio internè pallidè castaneis; lateribus colli carunculâ brevi subovali compressâ instructis.

Genarum plumulæ a rictu sub oculos extendentes albæ, sericeæ, breves. *Tectricum remigum*que plumæ albido marginatæ, harum pogoniis internis in medio castaneo-marginatis, fasciam castaneam, alis clausis, subtus exhibentibus. *Rostrum* nigrum. *Pedes* flavescentes. Longitudo *corporis*, 11; *alæ* a carpo ad remigem quartam, $6\frac{1}{3}$; *caudæ*, $6\frac{7}{10}$; *rostri* ad rictum, $1\frac{3}{10}$, ad frontem, 1; *tarsi*, $1\frac{3}{10}$.

In Museo Societatis Zoologicæ.

Memoriæ Domini JOANNIS GULIELMI LEWIN, *peregrinatoris in Australiâ seduli sagacissimique, qui Meliphagidarum characteres primùm detexit et illustravit, hæc avis sit sacra.*

The *Poe Honey-Eater* of Dr. Latham, *Merops Novæ Zealandiæ*, Gmel. (*M. concinnatus*, Lath.) may be referred to this group, of which it has the bill and the general characters. In its tail only it differs, which is slightly rounded at the *apex*.

* *Τροπις carina*, and *ῥυγχος rostrum*.

 usually

usually the character of those birds, that we have much doubt as to the actual situation of our group.

1. CORNICULATUS. *Trop. brunnescenti-griseus, subtus albidus; capite, collo superiori, gutturisque torque angusto atris, nudis; mento, pectore, rectricumque apicibus albis, hoc graciliter fusco-lineato; rostri carinâ ad basin conspicuè tuberculatâ.*

Merops corniculatus. *Lath. Ind. Orn. p.* 276. *no.* 21.
Corbi calao. *Le Vaill. Ois. d'Am. et des Indes*, i. *p.* 69. *pl.* 24.
Knob-fronted Honey-Eater. *Lath. Gen. Hist.* iv. *p.* 161. *no.* 6.

Mr. Caley has the following observations on these birds. "*Friar*.—A very common bird about Paramatta, called by the natives *Coldong*'.—It repeats the words 'poor soldier' and 'four o'clock' very distinctly.—I have frequently seen three or four of them flying after a hawk, which they seemed desirous of attacking. It is a strong and sharp-clawed bird."

2. MONACHUS? *Trop. suprà brunnescenti-griseus, nuchâ albo-variegatâ, subtus albidus; capite atro, nudo, sincipite plumulis albis operto; rectricibus concoloribus; rostri carinâ ad basin subtuberculatâ.*

Merops monachus? *Lath. Ind. Orn. Supp. p.* xxxiv. *no.* 10.
Knob-fronted Bee-Eater? *White's Journ. pl. in p.* 190.
Cowled Honey-Eater? *Lath. Gen. Hist.* iv. *p.* 162. *no.* 7.

We have some doubt whether our bird is the same as Dr. Latham's species; or whether both may not be the young of the *Trop. corniculatus*. The specimen in our collection differs from that species by being smaller; by the top of the head being covered with short downy white feathers instead of being entirely bare; by the knob of the base of the bill being less elevated;

vated; and by the nuchal feathers being variegated with white. But these are differences which may belong to the young bird, and be lost in the adult. In such cases we can determine nothing from the mere skins. These points must be investigated on the spot. We must however observe, that the bird which we at present refer to, came from a different locality to that of *Trop. corniculatus;* having been procured by Mr. Brown on the North coast in February 1803, while Mr. Caley's specimens of the other birds were obtained in the neighbourhood of Paramatta.

Mr. Caley also observes in his Notes upon *Trop. corniculatus*, that he "never shot a specimen of the species which had white on the head, as figured in *White's Journal.*"

3. Cyanotis. *Trop. suprà olivaceo-viridis, capite nuchâque atris, jugulo pectoreque grisescenti-atris, lineâ suboculari a rictu extendente, torque occipitali, corpore subtus, rectricumque apicibus albis.*

Gracula cyanotis. *Lath. Ind. Orn. Supp. p.* xxix. *no.* 5.
Blue-cheeked Honey-Sucker. *Lewin, Birds of New Holl. pl.* 4.
Graculine Honey-Eater. *Lath. Gen. Hist.* iv. *p.* 166. *no.* 11.

"This bird," says Mr. Caley, "is called *Bati'kin* by the natives.—Whether it is migratory or not it would be hazardous for me to say; as I have only seen it occasionally, although in different places.—I once observed several of them frequenting a tree, where they were busy in obtaining something that appeared to have exuded from a wounded part. I do not know what the substance could be, otherwise than a kind of gum of a bitter and astringent taste.

Genus. SERICULUS. *Swains.*

1. CHRYSOCEPHALUS.* *Ser. sericeo-ater; capite suprà, nuchâ, fasciâque mediâ alarum aureo-flavis.*

Meliphaga chrysocephala. *Lewin, Birds of New. Holl. pl.* 6.
Sericulus chrysocephalus. *Swains. Zool. Journ. vol.* i. *p.* 478.
Loriot Prince-Régent. *Temm. Pl. Col.* 320.
Golden-crowned Honey-Eater. *Lath. Gen. Hist.* iv. *p.* 184. *no.* 38.

The actual situation of this bird in the Order of *Insessores* remains hitherto undetermined. Nothing has transpired respecting its habits or internal structure to make us either alter, or retain with any confidence, the place originally assigned it by Mr. Lewin.

Genus. MIMETA†. *King.*

1. VIRIDIS. *Mim. olivaceo-viridis, subtus albida, nigro guttatim striata; alis caudâque nigro-fuscis, illis albido-marginatis, hâc apice albo.*

* We insert the following characters of the female of this species, which we have taken from a fine specimen in the collection of Mr. Leadbeater. A figure has been given of it by M. Duperrey, in the 20th plate of the "*Voyage autour du Monde.*"

Fœm. *brunnea, dorso pectoreque albido-lunulatis; vertice, gulæ medio, torqueque nuchali nigris; abdomine albido, brunneo-lunulato.*

*Frontis occipitis*que plumæ pallidiori-brunneæ, in medio albido-lineatæ. *Alæ* brunneæ, pogoniis internis fuscis ad basin albidescentibus; subtus fuscescentes, pogoniis internis pallido-flavo marginatis. *Tectrices* inferiores pallidè flavæ, fusco-brunneo lunulatæ. *Rectrices* brunneæ, subtus subfuscæ pallidè flavescentes. *Rostrum pedes*que nigri. Longitudo *corporis*, $10\frac{3}{4}$; *alæ* a carpo ad remigem quartam, $5\frac{1}{2}$; *rostri*, $1\frac{5}{20}$; *caudæ*, $4\frac{1}{2}$; *tarsi*, $1\frac{3}{8}$.

A young male bird in the collection of Mr. Leadbeater, exhibits exactly the same plumage as the female, with the exception of some golden-coloured feathers appearing on the back part of the head, and the shafts of the secondary quill-feathers being of the same colour.

† We have taken the liberty of altering the orthography of this word from *Mimetes* to *Mimeta*; the former word having been already appropriated by Mr. Brown to a genus of plants in these *Transactions* (vol. x. p. 105).

Gracula

Gracula viridis. *Lath. Ind. Orn. Supp. p.* xxviii. *no.* 2.
Mimetes viridis. *King, Survey of the Intertropical Coasts of Australia, vol.* ii. *p.* 419.
Green Grakle. *Lath. Gen. Hist.* iii. *p.* 168. *no.* 24.

2. Flavo-cincta. *Mim. flavo-viridis, subtus pallidior, capite dorsoque fusco-lineatis, alis caudâque nigris viridi flavoque variegatis.*
Mimetes flavo-cinctus. *King, Survey, &c. vol.* ii. *p.* 419.

The Society is indebted for this bird to Captain Philip Parker King, R.N., F.R. & L.S., who first discovered the species, and described it from this specimen. As far as can be judged from the mere *exuviæ* of birds, where few specimens can be compared together, this bird appears a very distinct species from *Mim. viridis*.

3 Meruloides. *Mim. suprà brunnescenti-olivacea, fusco-striata, subtus alba fusco striatim guttata; tectricibus supernis remigibusque secundariis pallido-rufo marginatis; rectricibus apice albis.*

*Capitis nuchæ*que plumæ striis fuscis gracilibus, *dorsi* latioribus in medio notatæ. *Tectrices* inferiores rufæ, fusco-variegatæ. *Rectrices* fuscæ apicibus albis. Longitudo *corporis*, $10\frac{3}{4}$; *alæ* a carpo ad remigem quartam, $5\frac{7}{10}$; *caudæ*, 5; *rostri* ad rictum, $1\frac{1}{5}$, ad frontem, 1; *tarsi*, $\frac{19}{20}$.

We have already alluded to the difficulty of determining the limits of species by the skins only of birds, without the opportunity of examining the changes in their plumage from age or season in their native countries. It is of course with hesitation that we give the three foregoing species as distinct. A general similarity in the disposition of their colours prevails throughout the

the group, as is indeed usually the case in what are called natural genera. But a decided difference in the colours themselves is exhibited in these three alleged species; and it is our custom to keep all such apparent species distinct until they are proved to be the same. Many mistakes will without doubt arise by an adherence to such a rule. But these mistakes are easily acknowledged and retrieved when proved to be such. When we cannot represent Nature as she is, we must endeavour to represent her as she appears to be. If we suspend our observations in apprehension of committing an error, we shall soon cease to represent her at all.

As to the group itself, it is not in our power to add any information to that which Captain King has given in the Appendix to his "*Survey*."—The following extract from Mr. Caley's MSS. contains all the knowledge we have of these birds. He speaks undecidedly; but what he says is against the opinion that they are *meliphagous*. "These are birds of passage. I think I once saw a flock of them in Government Garden, and that the gardener complained of their destroying the figs. One of my specimens, to the best of my recollection, I shot in a *green wattle-tree* close to Government House."

Genus. Psophodes*.

Rostrum forte, breve, subrectum, subcompressum; *culmine* vix carinato, subarcuato; *mandibulis* integris; *naribus* basalibus, ovalibus, plumulis setisque frontis opertis; *rictu* vibrissis fortibus incumbentibus instructo.

Alæ brevissimæ, rotundatæ; *remigibus* primâ brevi, secundâ tertiâ et quartâ gradatim longioribus, quintâ ad nonam inclusam ferè æqualibus, longissimis.

Cauda elongata, gradata.

* Ψοφος *crepitus.*

Pedes

Pedes subfortes, subelongati; *acrotarsiis* scutellatis, *paratarsiis* integris.

This form offers one of the greatest difficulties to the investigator of affinities. The birds that exhibit it are said to be *Honey-Eaters*. This we much doubt. They are found among the flowers of the *Eucalypti*; but this circumstance may arise as well from their being in search of the insects abounding in these flowers, as of the honey contained in them. It is strange that we have never been able to examine a tongue of these birds, although the skins are common. Their general appearance indicates much of the *Shrike*. The strong bristles of the *rictus* suggest the idea of their food being animal, and indeed originally induced Dr. Latham to place them with the Linnean *Muscicapæ*. The integrity of the margins of the bill, on the other hand, seems to militate against this supposition. The extreme shortness and roundness of the wing again, and the long and graduated tail, are additional characters that demand consideration. In these characters, as well as in the length and softness of the feathers on the back, they approach the long-tailed American *Thamnophili*. On the whole these birds form an interesting object of research to the naturalist, who may have the opportunity of determining their exact station in the Order, by observation of their habits and characters in their native country. Until these points are ascertained, we leave them at the extremity of this family, to which they are usually referred.

1. Crepitans. *Psoph. olivaceo-brunneus, subvirescens; capite cristato, jugulo pectoreque nigris; tæniâ latâ utrinque sub oculos, rectricumque apicibus albis; abdomine albo-variegato, femoribus rufescentibus.*

Muscicapa crepitans. *Lath. Ind. Orn. Supp. p.* li. *no.* 10.
Coach-whip Honey-Eater. *Id. Gen. Hist.* iv. *p.* 187. *no.* 43.

Mr. Caley informs us that "this bird is more often heard than seen. It inhabits brushes. The loud cracking whip-like noise it makes (from whence the colonists give it the name of *Coach-whip*) may be heard from a great distance."

Genus. POMATORHINUS. *Horsf. in Linn. Trans.*

1. TEMPORALIS. *Pom. cineraceo-fuscus, subtus fulvescenti-fuscus; fronte, temporibus, gutture, pectoreque albis; tæniâ gracili super alterâque subtus oculos, caudâque nigris, hâc apice albido.*

Caput in medio pallidè fuscum, *fronte, temporibus*que albis. *Remiges* externè pallidè fuscæ, ad apicem saturatiores. *Tectrices* inferiores pallidè ferrugineo-fuscæ. *Rectrices* nigræ, omnes, mediis exceptis, ad apicem albæ. *Rostrum* nigrum, ad frontem albescens. *Pedes* nigri. Longitudo *corporis*, $10\frac{1}{4}$; *alæ* a carpo ad remigem quartam, $4\frac{1}{2}$; *caudæ*, $4\frac{3}{5}$; *rostri* ad frontem, $1\frac{3}{20}$, ad rictum, $1\frac{1}{5}$; *tarsi*, $1\frac{3}{10}$.

Dusky Bee-Eater. *Lath. Gen. Hist.* iv. *p.* 146. *no.* 31.

This species was found by Mr. Brown at Shoalwater Bay, August 1802.

2. SUPERCILIOSUS. *Pom. brunnescenti-fuscus; tæniâ superciliari ad nucham extendente, gulâ, pectore, abdomine anteriori, caudâque apice albis.*

*Frons, lora*que nigro-notatæ. *Remiges* fuscæ, subtus pallidiores. *Tectrices* inferiores pallidè brunnescenti-fuscæ. *Abdomen* imum *crissum*que brunneo-fusca. *Rectrices* brunneo-nigræ, omnes, mediis exceptis, ad apicem albæ. *Rostrum pedes*que nigri. Longitudo *corporis*, $7\frac{7}{10}$; *alæ* a carpo ad remigem quartam, $3\frac{7}{10}$; *caudæ*, $3\frac{1}{2}$; *rostri* ad frontem, $\frac{19}{20}$, ad rictum, $1\frac{1}{20}$; *tarsi*, $1\frac{1}{10}$.

This

This bird was procured by Mr. Brown on the South coast of New Holland in 1802.

These two species very closely accord with the Javanese species of *Pomatorhinus*, *P. montanus*, described in these Transactions. The short and rounded wings, the somewhat lengthened and rounded tail, and the elevated *tarsi*, at once point out the affinity. The bills of the New Holland birds are not so much arcuated as those of the Javanese; nor is the developement of the *nares* so conspicuous. But the general accordance is so great, that we feel no hesitation, in the present imperfect state of our information at least, in referring all these species to the same group. The structure of the tongue of these birds, as well as the nature of their food, is as yet unknown: and as they evince in some points a very striking accordance with the *scansorial* family of *Certhiadæ*, we have some doubts whether they may not be more justly referred to that group than to the *Meliphagidæ*. Their *nares*, on the other hand, indicate an affinity to the latter family, where we leave them provisionally for the present. To whichever of the two groups they will eventually be ascertained to belong, they will be found, we make no doubt, to stand at the extremity of it, and to form the passage to the other.

(*End of Part I.*)

X. *Notice of a Species of Ursus from Nepaul. By Thomas Horsfield, M.D., F.L.S. and F.G S.*

Read June 20, 1826.

I TAKE the liberty to offer to the Society a concise description of the skin of a Bear from India, probably belonging to a new species, which was lately presented to our Museum by H. T. Colebrooke, Esq. This skin was forwarded from the Nepaul mountains agreeably to a particular request; and it is to be regretted that, notwithstanding every necessary instruction given by the correspondent of Mr. Colebrooke, it was considerably injured by the process of preparation, and the skull was entirely removed. The front teeth, however, remain perfect in both jaws: they agree in all points with the character of the genus *Ursus*, as now defined.

The entire length of the skin, from the tip of the nose to the extremity of the tail, is 3 feet 10 inches; across the middle of the abdomen and back it measures 2 feet 3 inches. Judging from the teeth and claws, the skin appears to have belonged to an adult animal. The fur on the top of the head, neck and shoulders, is lengthened, shaggy and curled; on the flanks and on the abdomen and extremities it is short and closely applied. The thighs are partly covered with more rigid, bristly hairs. The claws on the fore-feet are small, obtuse, thick, strongly rounded above, and almost straight; on the posterior feet they have the same general character, but are considerably smaller; they

they are on both feet covered, and partly concealed at the base, by thick bristly hairs, closely applied and directed forwards.

The general colour of the hairy covering of the specimen presented to the Society is tawny, or very pale reddish-brown, with an obscure tint of dirty yellow, verging to isabella. It is almost uniform on every part. On the top of the head, tufts of a lighter colour, almost white, are mixed with the rough curls covering these parts. The under parts of the neck appear to have been of a darker hue; but the muzzle is scarcely different from the posterior parts of the head. The tail is about an inch long. The relative proportion of the extremities and of the body and neck cannot be ascertained with accuracy; and as the skin is not sufficiently perfect for being set up, several other characters remain for future inquiry: the chief of these are, the form of the head, the character of the nose and lips, the situation of the eyes, the vibrissæ, and the length and proportion of the ears.

Our animal is of a habit decidedly different from that of several species of *Ursus* from the same part of the world, which have recently been added to the systematic Catalogues, namely, the *Ursus Tibetanus*, the *Ursus labiatus*, and the *Ursus Malayanus*. All these have a jet-black fur, a semilunar mark of a white colour on the breast, and other peculiarities affording types of subgenera, among which *Prochilus* and *Helarctos* have been defined. Our animal, on the contrary, appears to resemble the European Bears in its structure, as far at least as can be determined from the parts which have been preserved in the specimen. Among these, the claws afford the best means of comparison; they are small, obtuse, and straight, while those in the Asiatic Bears above-mentioned are large, strongly-curved, acute, and fitted for climbing.

The colour of our animal appears to be peculiar, and its size

is

is somewhat less than that of the Brown Bear of Europe as described by M. Cuvier in the 4th volume of the "*Ossemens Fossiles :*" but to determine the peculiarities with perfect precision, more accurate notices regarding its form are required. The specific name *isabellinus* is proposed for our animal, and the following concise character serves to discriminate it from the other species of *Ursus* hitherto described.

URSUS ISABELLINUS.

U. sordidè fulvus nitore isabellino, pilis colli dorsique elongatis, molliusculis, crispatis ; ad latera rigidis, adpressis ; unguibus brevibus, rectis, obtusis.

THE

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MDCCCXXVII.

CONTENTS.

PART I.

I. *A Catalogue of the Norfolk and Suffolk Birds; with Remarks. By the Rev.* Revett Sheppard, *A.M. F.L.S. and the Rev.* William Whitear, *A.M. F.L.S.* p. 1

II. *On the Structure of the Tarsus in the Tetramerous and Trimerous Coleoptera of the French Entomologists. By* W. S. MacLeay, *Esq. A.M. F.L.S. Communicated by the Zoological Club of the Linnean Society* - p. 63

III. *Notice on a peculiar Property of a Species of Echinus. By* E. T. Bennett, *Esq. F.L.S. Communicated by the Zoological Club of the Linnean Society* - - p. 74

IV. *A Commentary on the Third Part of the Hortus Malabaricus. By* Francis Hamilton, *M.D. F.R.S. and F.L.S.* - - - - - - - p. 78

V. *Observations on the Crepitaculum and the Foramina in the anterior Tibiæ of some Orthopterous Insects. By the Rev.* Lansdown Guilding, *B.A. F.L.S.* - p. 153

VI. *Description of the* Plectrophanes Lapponica; *a Species lately discovered in the British Islands. By* Prideaux

deaux John Selby, *Esq. F.L.S. Communicated by the Zoological Club of the Linnean Society* - - p. 156

VII. *Description of a new Genus of the Class Mammalia, from the Himalaya Chain of Hills between Nepaul and the Snowy Mountains. By Major-General* Hardwicke, *F.R.S. and F.L.S.* - - - - - p. 161

VIII. *Description of two new Birds from Nepaul. By Major-General* Hardwicke, *F.R.S. and F.L.S.* - p. 166

IX. *A Description of the Australian Birds in the Collection of the Linnean Society; with an Attempt at Arranging them according to their natural Affinities. By* N. A. Vigors, *Esq., M.A., F.R.S. F.L.S. and F.G.S., and* Thomas Horsfield, *M.D., F.L.S. and F.G.S. Communicated by the Zoological Club of the Linnean Society* p. 170

X. *Notice of a Species of Ursus from Nepaul. By* Thomas Horsfield, *M.D. F.L.S.* - - - - p. 332

PART II.

XI. *Some Account of a Collection of Cryptogamic Plants from the Ionian Islands. By* Robert Kaye Greville, *LL.D. F.L.S. F.R.S.E.* - - - - p. 335

XII. *Description of a new Genus belonging to the Natural Family of Plants called Scrophularinæ. By Mr.* David Don, *Libr. L.S.* - - - - - p. 349

XIII. *On Boswellia and certain Indian Terebinthaceæ. By* Henry Thomas Colebrooke, *Esq. F.R.S. and L.S.* p. 355

XIV. *The*

XIV. *The Natural History of Oiketicus, a new and singular Genus of Lepidoptera.* *By the Rev.* Lansdown Guilding, *B.A. F.L.S.* - - - - p. 371

XV. *Observations on the Tracheæ of Birds; with Descriptions and Representations of several not hitherto figured.* *By* William Yarrell, *Esq., F.L.S.* - - p. 378

XVI. *On two new Genera of Land Tortoises.* *By* Thomas Bell, *Esq., F.L.S.* *Communicated by the Zoological Club of the Linnean Society* - - - p. 392

XVII. *Of the Insect called* OISTROS *by the Ancients, and of the true Species intended by them under this Appellation: in reply to the Observations of* W. S. MacLeay, *Esq., and the French Naturalists.* *To which is added, A Description of a new Species of* CUTEREBRA. *By* Bracy Clark, *F.L.S., and Foreign Member of the Royal Academy of Sciences of Paris* - - p. 402

XVIII. *A Review of the Genus Combretum.* *By Mr.* George Don, *A.L.S.* - - - - p. 412

XIX. *Description of a new Genus of Plants belonging to the Order Nymphæaceæ: in a Letter to* H. T. Colebrooke, *Esq., F.R.S., F.L.S.* *By* Nathaniel Wallich, *M.D., F.L.S., F.R.S. Ed., &c.* - - p. 442

XX. *Observations and Experiments, made with a view to ascertain the Means by which the Spiders that produce Gossamer effect their aërial Excursions.* *By* John Blackwall, *Esq., F.L.S.* - - - - p. 449

XXI. *De-*

XXI. *Descriptions of two Quadrupeds inhabiting the South of Africa, about the Cape of Good Hope. By* Andrew Smith, *M.D., Member of the Wernerian Society of Edinburgh, Superintendent of the South African Museum, and Assistant Surgeon to the Forces. Communicated by Sir* Everard Home, *Bart., V.P.R.S., F.L.S., &c.* - - - - - - - - p. 460

XXII. *An Account of a Pair of hinder Hands of an Orang Otang, deposited in the Collection of the Trinity-House, Hull. By* John Harwood, *M.D., F.R.S. & L.S. Communicated by the Zoological Club of the Linnean Society* - - - - - - - - p. 471

XXIII. *On Systems and Methods in Natural History. By* J. E. Bicheno, *Esq., F.R.S., Sec. L.S.* - p. 479

XXIV. *An Account of a new Species of Pinus, native of California: in a Letter to* Joseph Sabine, *Esq., F.R. and L.S., Secretary of the Horticultural Society. By Mr.* David Douglas, *A.L.S. Communicated by Mr.* Sabine - - - - - - - - p. 497

XXV. *Remarks on the Antilope Chickara: in two Letters addressed to the Secretary. By* Robert Hills, *Esq., F.L.S.* - - - - - - - - p. 501

XXVI. *Extracts from the Minute-Book of the Linnean Society* - - - - - - - - p. 506

Catalogue of the Library of the Linnean Society - p. 514

List of Donors to the Library of the Linnean Society p. 527

Donations to the Museum of the Linnean Society - p. 531

TRANS-

XI. *Some Account of a Collection of Cryptogamic Plants from the Ionian Islands. By Robert Kaye Greville, LL.D. F.L.S. F.R.S.E.*

Read February 7, 1826.

Under the impression that the smallest contribution towards a more complete knowledge of the botany of the Grecian Isles would not be unacceptable to the Society, I have drawn up the following brief account of a collection of cryptogamic plants recently brought from thence by the Right Honourable the Earl of Guilford. It was placed in my hands by Mr. David Don, Librarian to the Society.

The number of species contained in the collection is but small: and it is necessary to observe, that many of the specimens are in too imperfect a state to admit of minute examination; these I have omitted, preferring to give a shorter list than run the hazard of adding to the number of the errors with which cryptogamic botany is already so much incumbered. There are still, however, several plants of great interest, and some new species.

BYSSOIDEÆ

(Filamentous plants, referred by most authors to the Linnæan Order *Fungi*).

Genus 1. Trichothecium.

1. T. roseum. *Link in Mag. der Gesell. Naturfor. Freunde zu Berlin*, iii. *p.* 18. *Nees. Syst. t.* 3. *f.* 41.

Genus 2. SPOROTRICHUM. (*Collarium.*)

1. *S. badium*, thallo cæspitoso, badio; filis tenuissimis, confervoideis, implexis; sporidiis concoloribus, ovalibus; acervulis distinctis, coacervatis.

On moist wood in a state of decay.

The aspect of this little plant is very much that of *Conferva arachnoidea*. The threads are jointed, and two or three lines in length. It belongs to the genus *Collarium* of Link in *Magaz. der Gesell. Naturfor. Freunde zu Berlin;* but that genus has been subsequently reunited by him to *Sporotrichum*, under which it is also found in Persoon's *Mycologia*. Vide Link in *Jahrbuch der Gewächskunde*, i. *p.* 163.

GASTROMYCI

(Part of the Linnæan Order *Fungi*).

Genus 3. CYATHUS.

1. C. Crucibulum. *Pers. Syn. Fung. p.* 238. *Grev. Cr. Fl. t.* 34.

Genus 4. SCLEROTIUM.

1. *S. gyrosum*, parvum, nigrum, erumpens, plano-convexum, sulcis gyrosis rugosum, intus albidum. TAB. III. f. 1.

On dead leaves of some monocotyledonous plant.

Entire plant not more than one or two lines in breadth, more or less circular, sometimes ring-like, from the centre being unoccupied. The surface is very similar to the shields of some species of *Gyrophora*.

FUNGI.

Genus 5. Peziza.

1. P. coccinea. *Jacq. Aust. t.* 163. *Grev. Cr. Fl. t.* 171.

ALGÆ.

(*Diatomeæ.*)

Genus 6. Diatoma.

1. D. fasciculatum. *Ag. Syst. Alg. p.* 3.

Genus 7. Gloionema.

1. G. paradoxum. *Ag. Syst. Alg. p.* 11. Echinella paradoxa. *Lyngb. Tent. Hydrophyt. Dan. p.* 211. *t.* 70. *Grev. Cr. Fl. t.* 25.

(*Confervoideæ.*)

Genus 8. Bangia.

1. B. atro-purpurea. *Ag. Syst. Alg. p.* 76. Conferva atro-purpurea. *Dillw. Conf. t.* 103.

Genus 9. Conferva.

1. C. catenata. *Roth. Cat.* ii. *p.* 210. *Ag. Syst. Alg. p.* 119.
2. C. prolifera. *Roth. Cat.* i. *p.* 182. *t.* 3. *f.* 2; *et* ii. *p.* 213. *Ag. Syst. Alg. p.* 119.
3. C. trichotoma. *Ag. Syst Alg. p.* 121.

Genus 10. Ceramium.

1. C. diaphanum. *Roth. Cat.* iii. *p.* 154. *Ag. Syst. Alg. p.* 133.

Genus 11. Polysiphonia. *Grev.* (Hutchinsia. *Ag.*)

1. P. fruticulosa. *Grev.* Hutchinsia fruticulosa. *Ag. Syst. Alg. p.* 158. Fucus fruticulosus. *Turn. Hist. Fuc. t.* 227.

2. P. fila-

2. P. filamentosa. *Grev.* Hutchinsia filamentosa. *Ag. Syst. Alg. p.* 159.

Genus 12. ECTOCARPUS.

1. E. siliculosus. *Lyngb. Tent. Hydrophyt. Dan. p.* 131. *t.* 43. *Ag. Syst. Alg. p.* 161.

Genus 13. SPHACELLARIA.

1. S. scoparia. *Lyngb. Tent. Hydrophyt. Dan. p.* 104. *t.* 31. *Ag. Syst. Alg. p.* 167.

(*Ulvaceæ.*)

Genus 14. BRYOPSIS.

1. B. plumosa. *Ag. Syst. Alg. p.* 178. Ulva plumosa. *Huds. Angl. p.* 571.

Genus 15. SOLENIA.

1. S. compressa. *Ag. Syst. Alg. p.* 186. Ulva compressa. *Linn. Sp. Pl. p.* 1632. *Engl. Bot. t.* 1739.

(*Florideæ.*)

Genus 16. CHONDRIA.

1. C. obtusa. *Ag. Syst. Alg. p.* 202. Fucus obtusus. *Turn. Hist. Fuc. t.* 21.

Genus 17. SPHÆROCOCCUS.

1. S. Teedii. *Ag. Syst. Alg. p.* 225. Fucus Teedii. *Turn. Hist. Fuc. t.* 205.
2. S. corneus. *Ag. Syst. Alg. p.* 225. Fucus corneus. *Turn. Hist. Fuc. t.* 257.

3. S. con-

3. S. confervoides. *Ag. Syst. Alg. p.* 232. Fucus confervoides. *Turn. Hist. Fuc. t.* 84.
4. S. acicularis. *Ag. Syst. Alg. p.* 237. Fucus acicularis. *Turn. Hist. Fuc. t.* 126.

Genus 18. Delesseria.

1. *D. tenerrima*, fronde tenuissimâ, aveniâ, lineari, dichotomâ, roseâ, apice obtusâ; soris sporidiorum sparsis. Tab. III. f. 2.

In the sea, attached to shells, corallines, and marine plants.

Root, a very minute callous disk, giving rise immediately to several very delicate *fronds*, which are from 2 to 4 inches in length, and regularly divided many times in a dichotomous manner, the segments divaricated, linear, 1—3 lines in breadth, obtuse at the apex, the margin entire. The *reticulation* is very irregular, similar to that of *D. punctata*. *Colour* a most delicate and beautiful pink, acquiring a brownish tinge towards the base; but in decay becoming almost colourless. I have not observed any capsular fructification, but the *sori* (as Agardh calls the clusters of seemingly naked granules) are scattered without any particular order over the frond.

It is now two years since I received excellent specimens of this highly beautiful plant, collected in Devonshire by my esteemed friend Mrs. Griffiths: as few persons are so well acquainted with the actual vegetation of marine *Algæ*, her opinion in favour of its being an undescribed species must be allowed to have great weight. Besides however studying the preserved specimens, I had an opportunity of examining some in their native place of growth at Torquay a few weeks ago, and thus am enabled to add my opinion to hers in support of their distinctness.

At

At first sight it has a near resemblance to some states of *Sphærococcus bifidus*, but the discovery of the fructification proved it to belong to a different genus. In texture and delicacy as well as fructification it is nearly allied to *Delesseria punctata*, but the constant dichotomous, linear, smaller frond, and very divaricated segments, keep it sufficiently apart.

The specimens in the present collection are smaller and not fertile; yet I think there cannot be a doubt of their being the same species.

(*Fucoideæ.*)

Genus 19. SCYTOSIPHON.

1. S. fœniculaceus. *Lyngb. Tent. Hydrophyt. Dan. p.* 63. *t.* 14. *Ag. Syst. Alg. p.* 258. Fucus subtilis. *Turn. Hist. Fuc. t.* 234.

Genus 20. HALISERIS.

1. H. polypodioides. *Ag. Syst. Alg. p.* 262. Fucus membranaceus. *Stackh. Ner. Brit. p.* 13. *t.* 6. *Turn. Hist. Fuc. t.* 87.

Genus 21. ZONARIA.

1. *Z. rubra*, fronde reniformi, planâ, subintegerrimâ, fragili, nitidâ, rubrâ, lineis minutissimis longitudinaliter densissimè notatâ. TAB. III. f. 3.

In the sea, about the roots of *Zostera marina*.

Frond dull pinkish red, half an inch to one inch in breadth, roundish reniform, nearly plain, the margin entire or very slightly lobed; surface glabrous, somewhat glistening, densely reticulated, the reticulations minute, arranged in close parallel convex longitudinal lines, scarcely perceptible to the naked eye. There are also a few transverse corrugations.

corrugations. Beneath, the frond is hoary with a pale tomentose covering.

Genus 22. Cystoseira.

1. C. Abies marina. *Ag. Syst. Alg. p.* 282. Fucus Abies marina. *Turn. Hist. Fuc. t.* 249.
2. C. granulata. *Ag. Syst. Alg. p.* 282. Fucus granulatus. *Turn. Hist. Fuc. t.* 251.

Genus 23. Sargassum.

1. S. pallidum. *Ag. Syst. Alg. p.* 307. Fucus pallidus. *Turn. Hist. Fuc. t.* 67.

HEPATICÆ.

Genus 24. Riccia.

1. R. crystallina. *Linn. Sp. Pl. p.* 1605.

Genus 25. Anthoceros.

1. A. lævis. *Linn. Sp. Pl. p.* 1605.

Genus 26. Jungermannia.

1. J. epiphylla. *Linn. Sp. Pl. p.* 1602. *Hook. Jung. t.* 47.
2. J. inflata. *Huds. Angl. p.* 511. *Hook. Jung. t.* 38.
3. J. pusilla. *Linn. Sp. Pl. p.* 1602. *Hook. Jung. t.* 69.
4. J. complanata *β.* minor. *Hook. Jung. t.* 81. *f.* 17.

Dr. Hooker in his account of this species has noticed that the smaller lobes of the leaves throw out radicular fibres at the folded edge of the leaves, and he quotes the observation of Wahlenberg: "in ejus paginâ inferiore versus oram inferiorem papilla protuberat, primùm viridis, dein fuscescens et radicans." In the specimens before me I find this description to be very correct.

correct. This *papilla* is worthy of particular notice, as being always present, and near the fold of the leaf, but still quite on the plane surface. Though it sometimes throws out radicles, it more frequently produces a foliaceous expansion from its apex, of various forms, often circular like a little cup. I have observed the same kind of *papilla* in an exotic species. Of *J. complanata*, as far as regards this part, I have seen no correct figure.

5. J. dilatata. *Linn. Sp. Pl. p.* 1600. *Hook. Jung. t.* 5.

MUSCI.

* *Seta terminalis.*

Genus 27. TORTULA.

1. T. rigida. *Turn. Musc. Hiber. p.* 43. *Hook. et Grev. in Edin. Journ. of Science*, i. *p.* 289.

2. T. muralis. *Hedw. Sp. Musc. p.* 123. *Hook. et Grev. in Edin. Journ. of Science*, i. *p.* 292.

3. *T. Northiana*, caule brevi, simplici; foliis erecto-patentibus, lineari-lanceolatis acutis, siccitate tortuosis; thecâ subcylindricâ. TAB. III. f. 4.

(No particular station given. It probably grows on banks.)

Stem from 3 lines to half an inch in length, simple. *Leaves* pale bright green, whitish at their base, linear-lanceolate, erecto-patent, straight, acute, the margin slightly waved, entire; nerve strong, running to the point. In a dry state they are tortuose. *Fruitstalk* an inch in length, pale, slender. *Capsule* nearly cylindrical, slightly curved, with a subulate lid.

I have

I have to regret, in describing this species, that the fructification is too young to exhibit anything besides its general form. This prevents me from ascertaining the nature of the peristome, which probably resembles that of *T. subulata*, to which moss our species is most nearly allied. In the leaves, however, there is much greater length and narrowness, with almost the entire absence of an apiculus.

I have bestowed the specific name in honour of the illustrious individual by whom the collection was brought home.

4. T. fallax. *Swartz. Musc. Suec. p.* 40. *Hook. et Grev. in Edin. Journ. of Science*, i. *p.* 299.

Genus 28. Weissia.

1. W. pusilla. *Hedw. Sp. Musc. p.* 64. *Hook. et Tayl. Musc. Brit. t.* 15.

Genus 29. Dicranum.

1. D. bryoides. *Roth. Germ.* iii. *p.* 181. *Hook. et Tayl. Musc. Brit. t.* 16.
2. D. varium. *Hedw. Sp. Musc. p.* 133. *Hook. et Tayl. Musc. Brit t.* 17.

Genus 30. Didymodon.

1. D. trifarium. *Swartz. Musc. Suec. p.* 28. *Hook. et Tayl. Musc. Brit. t.* 20.

Genus 31. Funaria.

1. F. hygrometrica. *Hedw. Sp. Musc. p.* 172. *Hook. et Tayl. Musc. Brit. t.* 20.
2. F. hibernica. *Hook. et Tayl. Musc. Brit. t.* 20.

I have not access to Wahlenberg's plate and description in *Act. Holm.* 1806, of *F. calcarea*, which, according to Swartz, is the same as Hooker's *F. hibernica*. Thus, in order to avoid uncertainty, I have been obliged to keep up the more recent name.

Genus 32. BRYUM.

1. B. carneum. *Linn. Sp. Pl. p.* 1587. *Hook. et Tayl. Musc. Brit. t.* 29.
2. B. argenteum. *Linn. Sp. Pl. p.* 1586. *Hook. et Tayl. Musc. Brit. t.* 29.
3. B. capillare. *Linn. Sp. Pl. p.* 1586. *Hook. et Tayl. Musc. Brit. t.* 29.
4. B. cæspiticium. *Linn. Sp. Pl. p.* 1586. *Hook. et Tayl. Musc. Brit. t.* 29.
5. B. nutans. *Schreb. Lips. p.* 81. *Hook. et Tayl. Musc. Brit. t.* 29. Webera nutans. *Hedw. Sp. Musc. p.* 168.

6. *B. elegans*, caule breviusculo, innovationibus elongato-ramoso; foliis ovatis, laxè reticulatis, acutis integerrimis, concavis, margine apicem versus incurvato, nervo percurrente; thecâ obovatâ, inclinatâ; operculo convexo. TAB. III. f. 5.

On the ground in moist places.

Stem less than half an inch in height, but elongated by innovations to above an inch; the *innovations* slender and delicate. *Leaves* erecto-patent, pellucid, ovate, acute, concave, entire, with the margin so much incurved towards the point as to be almost involute, reticulated with lax, large, elongated cellules, and furnished with a slender percurrent nerve: those of the innovations are rather distantly placed, of a pale bright reddish brown below, the upper ones of a pale pleasant green. *Fruitstalk* about an inch in length, red. *Capsule* rather large, obovate, inclined, reddish brown, when very old, somewhat pyriform.

Some of the outer teeth of the peristome were perfect; but the inner ones were too much damaged for examination.

In

In every point of view this moss seems sufficiently distinct. The leaves are very strikingly vascular, and in this respect resemble those of an unpublished Nepalese species in my possession.

7. *B. Donianum*, caule breviusculo robusto, innovationibus brevibus ramoso; foliis densis summitate præcipuè aggregatis, erecto-patentibus, obovatis, acutis, marginatis, apice denticulatis, nervo excurrente; setâ elongatâ; thecâ clavatâ pendulâ; operculo brevi, conico. Tab. III. f. 6.

On the ground? (No station given.)

Stem about half an inch in height, robust, covered with brown tomentose radicular fibres, branched with very short innovations. *Leaves* few on the lower part of the stem, densely crowded and somewhat spreading at the top: they are rather broadly obovate (those of the innovations narrower), pointed, slightly concave, denticulate towards the apex, the margin decidedly thickened: nerve strong, and running more or less beyond the point, but never hair-like or transparent. The *colour* of the lower leaves is reddish; that of the upper ones a dull green, which is much brighter under the microscope, their base being moreover frequently of a beautiful deep pink. The nerve and thickened margin are also often reddish. The reticulation is small, the cellules roundish, except at the base, where they are elongated. *Fruitstalk* nearly two inches long, dark red. *Capsule* pendulous, brownish-red, large, clavate, the *lid* shortly and obtusely conical; this part, however, I have not seen in a mature state. *Inner peristome* equal in length to the *outer one*, each tooth composed of from 3 to 5 ribs terminating in a point, and connected by transverse bars. I could not perceive any alternating *ciliæ*.

This fine *Bryum*, which I have named after a naturalist daily rising in public estimation (Mr. David Don, Librarian to the Society), has at first sight the aspect of short specimens of *B. ventricosum*, especially in the character of its fruit; but the much broader leaves, the very thickened margin, excurrent nerve, and quite different kind of innovationary branches, are abundant marks of distinction. I am not aware of any other species with which it is likely to be confounded.

8. B. ligulatum. *Schreb. Lips. p.* 84. *Hook. et Tayl. Musc. Brit. t.* 30.

Genus 33. BARTRAMIA.

1. B. pomiformis. *Hedw. Sp. Musc. p.* 164. *Hook. et Tayl. Musc. Brit. t.* 23.

(*Seta lateralis.*)

Genus 34. LEUCODON.

1. L. Morensis. *Schwægr. Suppl.* i. 2. *p.* 2. *et Suppl.* ii. *t.* 25.

Genus 35. PTEROGONIUM.

1. P. gracile. *Swartz. Musc. Suec. p.* 26. *Hook. et Tayl. Musc. Brit. t.* 14.
2. P. Smithii. *Swartz. in Schrad. Journ.* ii. *p.* 173. *Hook. et Tayl. Musc. Brit. t.* 14.

Genus 36. FONTINALIS.

1. F. squamosa. *Linn. Sp. Pl. p.* 1571. *Hook. et Tayl. Musc. Brit. t.* 11.

Genus 37. HYPNUM.

1. H. riparium. *Linn. Sp. Pl. p.* 1595. *Hook. et Tayl. Musc. Brit. t.* 24.
2. H. confertum. *Dicks. Crypt. fasc.* iv. *p.* 17. *t.* 11. *f.* 14. *Hook. et Tayl. Musc. Brit. t.* 26.

3. H. te-

3. H. tenellum. *Dicks. Crypt. fasc.* iv. *p.* 16. *t.* 11. *f.* 12. *Hook. et Tayl. Musc. Brit. t.* 24. H. Agirianum, *Brid.*
4. H. illecebrum. *Hedw. Sp. Musc. p.* 252. *t.* 66. *f.* 1, 2? *Sm. Fl. Brit.* iii. *p.* 1314. *Engl. Bot. t.* 2189.
5. H. rutabulum. *Linn. Sp. Pl. p.* 1590. *Hook. et Tayl. Musc. Brit. t.* 26.
6. H. prælongum. *Linn. Sp. Pl. p.* 1591. *Hook. et Tayl. Musc. Brit. t.* 25.
7. H. cupressiforme. *Linn. Sp. Pl. p.* 1592. *Hook. et Tayl. Musc. Brit. t.* 27.
8. *H. Leskea*, caule infernè denudato, ramis fasciculatis; foliis ovatis acuminatis apice serratis, margine basi reflexo, nervo ante apicem evanescenti; thecâ ovato-cylindricâ, suberectâ; operculo conico, rostrato. Tab. III. f. 7.

(No station given.)

Stem erect, naked for about half an inch, then dividing into a number of slender fascicled sub-erect branches. *Leaves* closely imbricated when dry, but spreading when moist, numerous, ovate, acuminate, serrated towards the point, concave at the base, where the margin is also reflexed; nerve vanishing below the point. *Perichætial leaves* erect, imbricated, more acuminated, scarcely serrated at the point, the nerve disappearing lower down. *Colour* deep green. *Fruitstalk* nearly an inch in length. *Capsule* sub-erect, ovato-cylindrical. *Lid* conical, with a short acute beak. *Teeth* of the *inner peristome* with linear *lacunæ* or perforations down the middle, with very short alternating *ciliæ*.

LYCOPODINEÆ.

Genus 38. Lycopodium.

1. L. denticulatum. *Linn. Sp. Pl. p.* 1569.

EXPLA-

EXPLANATION OF TAB. III.

Sclerotium gyrosum. Fig. 1. Plant, nat. size. *a*. Plants magnified, one of them divided vertically.

Delesseria tenerrima. Fig. 2. Plant, nat. size. *a*. Portion of the frond. *b*. Portion of the frond with fructification;—magnified.

Zonaria rubra. Fig. 3. Plant, nat. size. *a*. Portion of the frond magnified.

Tortula Northiana. Fig. 4. Plants, nat. size. *a*. A leaf. *b*. Capsule;—magnified.

Bryum elegans. Fig. 5. Plant, nat. size. *a*. Portion of one of the innovations. *b*. A leaf. *c*. Capsule. *d*. Two of the teeth of the outer peristome;—magnified.

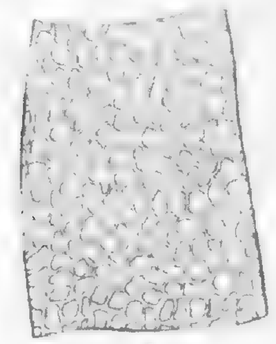
Bryum Donianum Fig. 6. Plant, nat. size. *a*. Leaf. *b*. Portion of the summit of a leaf. *c*. Capsule. *d*. Teeth of the outer peristome. *e*. Teeth of the inner ditto;—magnified.

Hypnum Leskea. Fig. 7. Plant, nat. size. *a*. Leaf. *b*. Perichætial leaf. *c*. Capsule. *d*. Teeth of the outer peristome. *e*. Teeth of the inner ditto;—magnified.

Fig. 1

a

Fig 2



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b

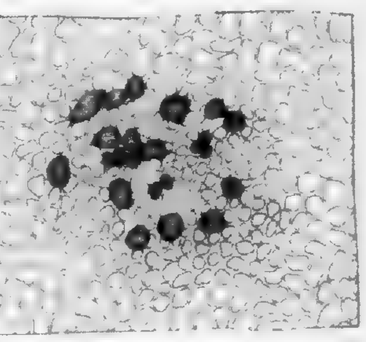
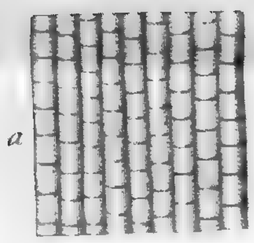


Fig. 3



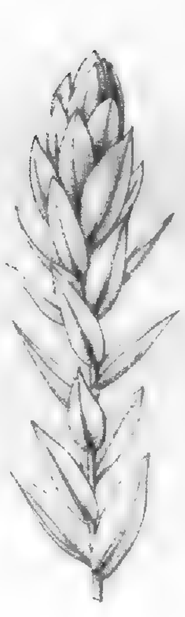
a

Fig 4

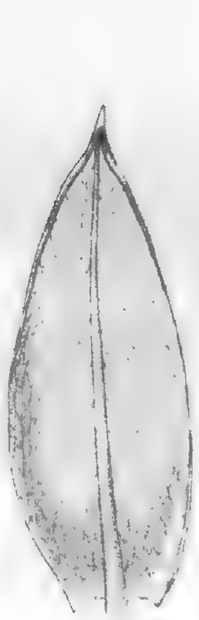
a

b

Fig 5.



a

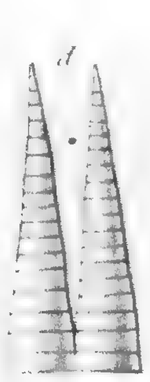


b

Fig 6

Fig 7

c



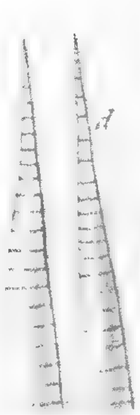
d

b

d

c

b



d

c

D^r. Greville del^t.

C. Fox. sculp^t

XII. *Description of a new Genus belonging to the Natural Family of Plants called Scrophularinæ. By Mr. David Don, Libr. L.S.*

Read March 21, 1826.

The discovery of new generic forms is always a subject of great importance in a natural system, as they tend to throw light on the affinities of those groups already known to us, and consequently to give us more enlarged views of the beauty and advantages of the natural classification. What renders the present genus still more interesting is its partaking of the characters of two very distinct natural orders. Possessing all the essential marks of the *Scrophularinæ*, it agrees also with *Jacaranda*, a genus belonging to the *Bignoniaceæ*, in the form and covering of its seeds. This new genus I propose to denominate *Lophospermum*, a name compounded of λοφος *a crest*, and σπερμα *seed*, in allusion to the form of its seeds. It consists at present of only two species, both natives of Mexico, where they were discovered by the Spanish botanists Sessé and Mocinno, in whose herbarium the one is marked *Besleria scandens*, and the other *Scrophularia physalodes*,—names, no doubt, vaguely given them at the time of collecting by the discoverers, of whose zeal and knowledge ample testimony is afforded by the extensive collections which they made in that interesting country. In a natural series our genus must be placed near to *Maurandia* and *Antirrhinum*. Its affinity to the former is shown by its calyx and capsules; but its compressed, tuberculated, winged seeds, and the

the form of its corolla, essentially distinguish it from both these genera. Both *Maurandia* and *Antirrhinum* have their seeds covered by a thick spongy testa, which is very much wrinkled, and resembles in a remarkable degree the testa of the curious cruciferous genus *Parrya* of Mr. Brown. This character is also met with in all those genera which are intimately allied to *Antirrhinum;* and it appears to me to be of sufficient importance to warrant their being regarded as a separate section, which may be denominated *Antirrhineæ*. *Chelone*, on account of its flat seeds and foliaceous cotyledons, will constitute another section of the order, forming the link of affinity between it and *Bignoniaceæ*, from which it principally differs in the direction of its seeds, and in the presence of albumen. *Sesamum* corresponds with the latter family in the absence of albumen; but in the form and direction of its seeds it is closely allied to *Chelone*, from which it is however essentially distinguished in the structure of its capsule, the absence of albumen, and by having the cells of its anthers parallel. It may therefore be considered as forming, together with *Martynia* and *Craniolaria*, a distinct natural group, as has already been suggested by Mr. Brown.

In *Scrophularia* the upper lip of the corolla is so much more developed than the lower one as to give the flower the appearance of being resupinate. The anthers of this genus differ very materially in structure from those of every other genus of the order; they are unilocular, and open by means of a transverse fissure, and the cell is attached along its whole length to the summit of the filament, in which particular it recedes from the usual form of the one-lobed anther.

A number of other sections equally distinct might be indicated, the adoption of which would greatly facilitate a knowledge of the genera of this extensive order. In a practical point of view, the advantages arising from the division of

extensive

extensive orders and genera into sections cannot, I think, be doubted.

In concluding this part of my subject, I beg leave to offer a few remarks on the use of the terms *contrary* and *parallel* as applied to the position of the dissepiment of bilocular fruits; as without such explanation, that part of the following description which relates to the position of the dissepiment would be liable to be misunderstood. I use the term *dissepimentum contrarium* to express such dissepiments as have their flat side facing the stem, or, more properly speaking, contrary to the axis of the flower, without regard to the compression of the valves; and *dissepimentum parallelum*, to denote such as are perpendicular to the axis of the flower, having their edge opposed to the stem. The distinction between the parallel and contrary dissepiment having been hitherto so vague and uncertain, the adoption of the preceding mode of applying the terms will be found very advantageous. In order to point out more clearly the inconvenience, if not absurdity, of the manner in which these terms have been hitherto applied, I need only mention, that in the greater part of *Scrophularinæ* the dissepiment is said to be parallel, and contrary in *Pedicularis* and some other genera, merely because the valves happen to be more compressed: for the fact is, its position is precisely similar. In all bilocular fruits having really a parallel septum, the dehiscence takes place at the margin of the valves.

LOPHOSPERMUM.

Syst. Linn. Didynamia Angiospermia. Prope Maurandiam.

Ord. Nat. Scrophularinæ. *Brown.* Sect. 2. *Antheris bilobis muticis, seminibus testâ coriaceo-spongiosâ corrugatâ v. reticulatìm scrobiculatâ præditis.* Antirrhineæ. *Nob.**

* I have found it necessary to modify in some degree the character of the section, from observing the differences assumed by the seeds of certain species of *Linaria*.

Char. Essent. *Calyx* 5-partitus. *Corolla* campanulata: *limbo* 5-lobo, subæquali. *Capsula* bilocularis, irregularitèr dehiscens. *Semina* imbricata, membranaceo-alata.

Descr. *Calyx* amplus, membranaceus, reticulato-venosus, 5-partitus: *segmentis* latis, ovatis. *Corolla* magna, campanulata, calyce duplò longior, basi tubulosa, fauce dilatata, limbo 5-loba, subæqualis: *lobis* latis, rotundatis, in æstivatione imbricatis. *Stamina* 4, didynama, fertilia, imæ parti tubi inserta, corollâ paulò breviora: *filamenta* angustè linearia, compressa, supernè glandulosa, basi angulo acuto arcuata, quasi stipite lævi compresso lateralitèr suffulta, ad flexuram glandulis capitatis munita, atque squamulis succulentis linearibus obtusis, exsiccatione ramentaceis, copiosè prædita: *antheræ* bilobæ, biloculares, muticæ, nudæ: *loculis* divaricatis, longitudinalitèr dehiscentibus, demùm explanatis. *Ovarium* globosum, biloculare. *Stylus* longissimus, filiformis, glaber, infernè crassior. *Stigma* simplex, emarginatum. *Capsula* sphærica, styli basi persistente coronata, bilocularis, subbivalvis, irregularitèr rumpens, polysperma. *Dissepimentum* transversum, latere (nec margine) ad caulem verso, completum, basi dilatatum. *Placentæ* 2, magnæ, oblongæ, scrobiculatæ, e septo ortum ducentes. *Semina* crebra, imbricata, adscendentia, compressa, membranâ scariosâ erosè crenulatâ cincta, apice truncata, basi hilo depresso instructa: *testa* crassa, coriacea, extùs corrugato-plicata et tuberculata. *Albumen* copiosum, ovoideum, cartilagineum, pallidè luteum. *Embryo* teres, erectus, ferè albuminis longitudine, lacteus: *cotyledones* brevissimæ, rotundatæ: *radicula* crassa, recta, obtusa, cotyledonibus duplò longior, centripeta.

Herbæ *v.* Frutices (Mexicani). Folia *alterna, serrata.* Flores *axillares, solitarii, pedunculati.*

1. *L. scan-*

1. *L. scandens*, foliis cordatis acuminatis inciso-serratis, pedunculis ebracteatis, caule herbaceo.
   Besleria scandens. *Sesse et Mocinno Mss.*
   Habitat in Mexico. *Sesse et Mocinno.* ♃ . (v. s. in Herb. Lamb.)

Planta formosissima, scandens, herbacea. *Rami* cylindracei, pilis mollibus articulatis viscidis copiosè vestiti. *Folia* ferè *Campanulæ Trachelii* numerosa, alterna, petiolata, cordata, acuminata, inciso-serrata, hirsuta, 5-nervia, 3—4 uncias longa, 2 v. 3 lata. *Petioli* semiteretes, villosi, bipollicares. *Flores* penduli. *Pedunculi* axillares, solitarii, uniflori, teretes, villosi, ebracteati, petiolo ferè duplò longiores, cum foliis uno latere versi. *Calyx* hirsutus, profundè 5-partitus : *segmentis* ovatis, acuminatis, integris v. hinc indè dente parvo instructis ; *duobus exterioribus* latioribus. *Corolla* magna, speciosa, purpureo-violacea ?

This is truly a most magnificent plant. Its climbing stems, copiously adorned with leaves and large, campanulate blossoms, render it a very desirable object It is necessary to observe, that the character and description of the genus are constructed principally from this species, because in the following there are some important points, particularly with respect to the ripe fruit and seeds, still remaining undetermined.

2. *L. physalodes*, foliis lanceolatis acutis denticulatis scabris, pedunculis bibracteatis, caule fruticoso.
   Scrophularia physalodes. *Sesse et Mocinno Mss.*
   Habitat in Mexico. *Sesse et Mocinno.* ♄ . (v. s. in Herb. Lamb.)

Caulis erectus, fruticosus. *Rami* teretes, rigidi, papilloso-scabri. *Folia* alterna v. nunc (præsertim suprema) subopposita, subsessilia, lanceolata, acuta, denticulata, aculeis minutissimis callosis scabra, sesqui- v. bi-pollicaria. *Pedunculi* axillares, solitarii,

solitarii, uniflori, teretes, scabri, foliis breviores, ultra medium bracteis 2 approximatis lanceolatis asperis muniti. *Calyx* asper, reticulatus, inflatus, 5-fidus: *lobis* semi-ovatis, acutis, integerrimis. *Corolla* ampla, sordidè violacea? præcedente multò brevior. *Filamenta* omninò glabra. *Antherarum lobis* longioribus, supernè confluentibus, basi tantùm divaricatis. *Stigma* simplex. *Ovarium* globosum, bilocurare. *Semina* nondùm vidi.

XIII. *On*

XIII. *On Boswellia and certain Indian Terebinthaceæ. By Henry Thomas Colebrooke, Esq. F.R.S. and L.S.*

Read April 4 and 18, 1826.

A DESCRIPTION of the tree which yields the Indian olibanum, (a gum-resin apparently undistinguishable from Arabian frankincense, though possibly the production of a different plant,) was inserted in the *Asiatic Researches** under the name of *Boswellia serrata:* and another species of the same genus, *Boswellia glabra*, which likewise affords a resin burnt as incense in Hindu temples, and employed with vegetable oil for the more useful purpose of marine pitch, has been described by Roxburgh in his third volume of *Indian Plants*†. In neither instance was the conformation of the seed particularly noticed. To supply that omission and furnish the carpology of this interesting genus, a full description of the fruit of the first-mentioned species is here subjoined. It is chiefly derived from the same source; that is, from my lamented friend Dr. Roxburgh's observations in aid of my own.

As the dissection of the germ shows the natural number of each cell to be two, that part of the generic character, as originally given, which specifies solitary seeds, may be modified; since they are single only by abortion. For this result is not to be invariably expected in all situations; although more than one

* Vol. ix. p. 377.

† Part I. t. 207.

ripe

ripe seed in a cell have not hitherto been observed in either of the described species.

The remarkable character of multifid and intricately folded cotyledons, which will be noticed, recurs in certain other plants of the same natural order, and especially in one which it is my purpose to describe in this essay, and which exhibits three-lobed contortuplicate cotyledons. It was first delineated solely from the flower; the fruit not having ripened on the trees where I observed the blossom. Dr. Wallich, having been more fortunate than myself in this respect, has since furnished me with a particular description of the ripe fruit, and has proposed the name of *Bursera serrata* for my plant. I had taken it, while unacquainted with its fruit, for an *Ailanthus*.

It certainly is akin to the *Marignia* of Commerson, which Lamarck introduced into the genus *Bursera*, with the specific name of *obtusifolia**; and which his continuator Poiret in one place remarks to have much affinity with Gærtner's *Dammara*, and in another says it appears to be the same†.

Gærtner himself, identifying his plant, of which the specimen was received from the Isle of Mauritius, with the *Dammara nigra* of Rumphius, indigenous in the Molucca Islands, remarked its near affinity to *Amyris*, and thought it possibly a genuine species of that genus‡. But it has the intricate foldings of the cotyledons which are remarked in *Bursera serrata*.

As the two genera of *Amyris* and *Bursera* are at present constituted, a botanist may well be still at a loss to which of them a new plant of the family is to be referred. The variable features of *Bursera gummifera*, and the early inaccurate descriptions of it, have led systematic writers to assign an essential character to the genus constructed on its type, which is very loose and uncer-

* *Encycl.* ii. 768.
† *Enc. Supp.* ii. 447 & 812.
‡ *Fruct. et Sem.* ii. 103.

tain;

tain: viz. "Polygamous; Dioicous: ♀ *Cal.* 3-, 4-, 5-toothed. *Cor.* 3-, 4-, 5-petalled. *Stam.* 6, 8, 10. *Styl.* 0. *Stigma* 3-lobed. *Caps.* 3-valved, 1-seeded. *Seed* arilled*." And it is further remarked concerning that generic description, that "the capsule is 2-, 3-, 4-, or 5-seeded; and that the genus differs from *Amyris* only in the sessile stigma and arilled seed†."

Yet Willdenow, whose remark it is, has annexed to *Amyris* all the *Icicas* of Aublet, in every one of which the seeds are enveloped in proper arilliform pulp; and the style is so obscure in those, as in several other species referred to *Amyris*, (particularly *A. polygama*, *A. pentaphylla*, *A. acuminata*, and *A. nana*, Roxb.), that the stigma may well be deemed sessile in divers plants of both genera.

The rest of the characters are not less indeterminate. *Amyris polygama*, as the name imports, has unisexual flowers. This indeed has been transferred to another genus (*Schinus dependens* of Ortega). But *Amyris Kataf* of Forskal appears also to be polygamous; and so do *A. acuminata* and *A. agallocha* of Roxburgh. While several *Burseras* exhibit no unisexual blossoms. *Amyris Zeylanica* is described as hexandrous: and *A. decandra*, as the specific name indicates, presents decandrous flowers; and so does another which I shall describe, and which I take to belong to the same family with the *Amyrides*, or at least with those of Roxburgh. More than one of the plants which have been referred to this genus are variable, like *Bursera gummifera*, in the number of stamina and their corresponding proportion of petals and calycine divisions.

The *berry* of *Amyris* varies as much in respect of the number of mature seeds contained in it, as the *capsule* of *Bursera*. Nor is the distinction of the pericarp, implied by those names, well founded in this instance. They are alike coriaceous and

* *Willd. Sp. Pl.* iv. 1119. † *Ibid.* 1121.

pulpy,

pulpy, going to pieces when dry, but not opening by determinate valves: they contain, in one or more cells, solitary seeds; or, if all the ovules ripen, two, or possibly sometimes three in each cell. In fact, throughout this family the fruit is a berry, in which the natural number of cells, containing two, or sometimes three ovules, agrees with that of the petals and calycine divisions (*sepala*), and corresponds to twice as many stamina. Exceptions are to be admitted, if the plants have been rightly classed and described; for *A. acuminata* and *A. simplicifolia* of Roxburgh, in which the germ exhibits but two cells, and *A. Zeylanica* of Retzius, in which osseous seeds coalesce and present a trilocular nut. But all three should perhaps, on account of these deviations from the natural structure, be removed from their present place to other genera.

The staminiferous ring around the germ, which was assumed for a distinctive mark of the *Icica* as a separate genus, is not more characteristic according to Willdenow*: for it is found, more or less conspicuous, in divers species of *Amyris*, as it likewise is in those of *Bursera*: and the insertion of stamina, as well as petals, in it, is an important character pervading the whole family.

In truth, as long ago remarked†, the three genera *Amyris*, *Icica*, and *Bursera*, require to be thrown together and re-cast. The whole group comprises nearly forty species, including several yet unpublished; and is likely to receive further accessions. It may be expected to become unwieldy for a single genus; and it actually comprehends plants which do not assort well together. It should therefore be subdivided, and moulded anew into distinct genera. But for this purpose much the greater part of the species requires re-examination, with a view to the distribution of them by truly discriminative marks.

* *Sp. Plant.* ii. 338. † *Juss. Gen. Pl.* 371. *Lam. Enc.* ii. 768.

If

If the attempt is to be at present made, the most obvious ground which could be immediately proposed, is that which was rejected by Willdenow; the presence and form of the nectary or disk encompassing the ovary. In many species of *Amyris* it is, as a nectary or glandular ring, wanting; being only shadowed or represented by a fleshy receptacle or continuous podogynium elevating the germ and receiving the filaments and petals inserted in its foot. In other instances the nectary is clearly present, consisting in a glandular ring, which girds the base of the germ, distinct from the receptacle beneath it, in which the stamina and petals are inserted. It is discriminated from that by a difference of form and appearance, or more simply separated by a contraction or intermediate strangulation. In some instances the annular receptacle of the germ or nectarial ring is crenulate; in others it is distinctly glandular; in a few it is merely protuberant.

The total absence of a nectary, and consequent restriction of the common receptacle of stamina and petals below and germ above to a simple podogynium, might serve to characterize one group in this family. Many species of *Amyris* belong to it: among them may be enumerated several Indian sorts, as *A. nana*, *A. acuminata*, and *A. pentaphylla* of Roxburgh.

A crenulate ring occurs in *Bursera serrata*; and this form of the nectary intimates analogy with *Boswellia*, which has a crenulate fleshy cup, in the exterior margin whereof the stamina are inserted. That analogy is strengthened by the examination of the seed, which exhibits in both instances multilobed and intricately folded cotyledons. The presence of a crenulate nectary, therefore, might be taken for the discriminative mark of one more group,—a link in the chain from the first-mentioned towards *Boswellia*.

Intermediately occurs another, in which the nectary is present

but most entire. For instance, *Amyris punctata*, *A. sumatrana*, and *A. heptaphylla* of Roxburgh. (This last is not to be confounded with Aublet's *Icica heptaphylla*, which is the *Amyris ambrosiaca* of Willdenow.) In all three the nectary is a large fleshy receptacle, separated from the receptacle of stamina and petals by a strangulation or contraction, which leaves an upper protuberance to uphold the germ, and a lower to receive the filaments and petals. The mature fructification of two of these plants has been observed and described. The seeds have no osseous covering, but a single tender integument. Their cotyledons are simple; flat on the contiguous sides, and convex, conform to the seed, on the outer surface.

Perhaps another division might be proposed for such plants as have a nectary distinctly glandular. For example, *Commiphora Madagascariensis* of Jacquin, the same with Roxburgh's *Amyris Agallocha*. Its nectary consists of as many glands as there are stamina, situated at the insertion of these. But the fruit of this species has not been yet inspected, nor even the hermaphrodite flower. Roxburgh, as well as Jacquin, was unable to find any besides male flowers.

It does not, however, appear in other instances, where the complete fructification has been examined, that those differences in the nectary precisely correspond with primary differences observable in the mature fructification, on which, as I apprehend, reliance is to be ultimately placed for a main ground of generic distinction. Yet it is material to attend to the nectarial character in this group of plants. If the staminiferous disk be connected, as in my view it is, with the germ rather than with the calyx, it determines the hypogynous insertion of the stamina; and consequently shows the necessity of disjoining these plants from the perigynous order of *Terebinthaceæ*, with which they have been associated. In this remark I rely on the maxim, that

that the presence of a podogynium always indicates an hypogynous insertion*: for the nectarial receptacle of the stamina seems to me to be clearly a distinct podogynium.

I have weighed on this point, because a new plant (*Pegia nitida*), which I am about to describe as belonging to the group under consideration, has traits which induced a distinguished botanist, Dr. Francis Buchanan Hamilton, whom I consulted shortly after making the delineation of it, to refer it to *Chalcas*, (a genus which might be revived for the reception of this plant); and because I perceive an affinity with it in a number of species which Roxburgh placed under *Amyris*, and likewise in one which Dr. Hamilton considered to be a *Bergera*, but which appears on minute examination of the germ and mature fruit, to be distinct from that genus and allied to Roxburgh's *Amyrides*. For the sake of rendering this quite evident, I shall subjoin a particular description of the fruit of the true *Bergera* (Kœnig's) copied from Roxburgh's manuscripts; the carpology of that genus being yet unpublished. It will be seen that they belong to distinct natural orders.

Bursera serrata. *Wall.*

Tab. IV. Fig. 1.

A very large tree, native of forests bordering on Bengal, near Gwalpara and the Garrow hills; whence it was introduced by seed into the Botanic Garden at Calcutta in 1808 by Dr. F. Buchanan Hamilton; and young plants in 1810 by Mr. R. Kyd.

The timber of this species is close-grained and hard; and is much esteemed and used for furniture by the inhabitants of Asham. It is as tough as oak, and heavier.

Its vernacular name is *Najor* or *Neyor*.

* *A. Richard, Elem. Bot.* 235.

The arilliform pulp has a pleasant subacid taste, and, like the skin, a weak scent of anise, of which the young leaves likewise partake.

Trunk arboreous, straight. *Bark* gray, scabrous, studded with oblong ochraceous specks; bursting when old. *Branches* scattered, spreading. *Young shoots*, *petioles*, *pedicels* and *calyces*, downy.

Leaves alternate, decussate, unevenly pinnate. *Leaflets* 3—5 pairs, with an odd one; broad-lanceolate, obtusely acuminate, serrulate; the largest 5 to 6 inches long, and 2 to 3 broad.

Petioles round, thicker at the base, pubescent.

Stipules none.

Panicles axillary, shorter than the leaves, open.

Flowers very small, yellowish-green.

Bractes at the base of pedicels, solitary, ovate.

Perianth inferior, flattish, five-toothed, downy. *Toothlets* obtuse.

Petals five, ovate to lanceolate, spreading, exteriorly downy, longer than the stamina.

Nectary a crenulate, narrow fleshy ring, girding the base of the germ.

Filaments ten, subulate, alternately shorter, inserted below the nectarial ring. *Anthers* ovate, two-celled.

Germ ovate, downy, obsoletely five-angled, five-celled, with one to two ovules in each cell, attached to the upper part of the axis. *Style* very short. *Stigma* five-cornered.

Berry globular, obtuse, sitting on the enlarged pedicel: purple with white dots: size of a damson: 1—3-celled.

Partition thick, dilated in the middle into a short, fleshy placenta.

Pulp

Pulp fibrous, arilliform, closely adherent to the shell of the pyrene, especially to the umbilical chink.
Pyrene single in each mature cell, size of a cherry-stone, roundish, with gibbous back and flat belly; greenish-yellow.
Shell stony, thick: swollen at the umbilical chink.
Seed solitary, oblong, concave on one side, convex on the other.
Integument single, crustaceous, white: barely marked with the rhaphe.
Perisperm none.
Embryo inverse, slightly bowed, greenish-white, brittle amygdaloid.
Cotyledons foliaceous, thin, intricately folded, chrysaloid. *Radicle* superior, cylindric, obtuse, thick.
Plumule obscure.
Seminal leaves of the germinating plantule, ovate, three-lobed, denticulate.

BOSWELLIA SERRATA. *Roxb.* C. *As. Res.* ix. *p.* 377, cum tab.

TAB. V. Fig. 1.

Germ superior, conical, three-sided, three-celled, with two ovules in each cell attached to the top of the axis.
Style cylindric. *Stigma* three-lobed.
Capsule three-sided; sides oval, three-celled, three-valved, opening spontaneously at the edge; *valves* smooth, hard, brown.
Seeds solitary; the second ovule in each cell being abortive: broad-cordate, with a fine membranaceous wing all around.
Perisperm none.
Embryo conform to the seed, inverse, pale-yellow. *Cotyledons* intricately folded, multifid. *Radicle* superior, short, conical.

PEGIA

PEGIA C.

ESSENT. CHAR. *Cal.* five-parted. *Cor.* pentapetalous, spreading. *Berry* one-seeded.

PEGIA NITIDA. C.

Indigenous in Silhet, where it blossoms towards the close of the cold season, and ripens its seed in the middle of the hot. Its name, in the vernacular dialect of the province, is *Pégí*.

Stem shrubby, said to be scandent?

Leaves alternate, unevenly pinnate. *Leaflets* five to seven pairs, with an odd one, gradually larger, subopposite, cordate, acuminate, remotely serrate, chiefly on the anterior margin; posterior lobes small, entire. *Young leaves* covered with down on both surfaces. Length of *leaflets* 2 to 3 inches: breadth 1 to $1\frac{1}{4}$.

Petioles channelled on the upper edge, thickening at the base; villous. *Petiolules* very short.

Stipules none.

Panicles axillary and terminal, branched, ovate.

Peduncles villous.

Bractes at the base of pedicels, solitary; ovate, villous.

Flowers pale green, with an agreeable odour; numerous, very small.

Perianth inferior, five-parted, minute, persistent. *Segments* round.

Petals five, oval, spreading.

Nectary a plano-concave, fleshy ring encompassing the germ, and surrounded by the stamina inserted in its base.

Filaments ten, nearly the length of the corol, alternately shorter, subulate. *Anthers* round, two-lobed.

Germ

Germ superior, round, half immersed in the nectary. *Style* short, conical. *Stigma* simple.

Berry globular, sitting on the permanent calyx; black, size of a currant, one-celled.

Pyrene solitary, oval, compressed, of a honey-colour, wrinkled.

Shell bony, fragile.

Seed solitary. *Integument* membranaceous, thin.

Perisperm none.

Embryo conform to the seed, white, inverse. *Cotyledons* oval, turgid, large, almond-fleshy. *Radicle* superior, minute, roundish.

Amyris heptaphylla. *Roxb.*

Tab. V. Fig. 2.

Native of mountains bordering on Silhet. Its leaves when bruised smell strongly of anise.

Stem shrubby. *Branches* suberect. *Bark* smooth, dark-coloured. *Leaves* alternate, unevenly pinnate. *Leaflets* alternate shortpetioluled; three to four pairs, with an odd one; obliquely lanceolate, entire, marked with transparent dots.

Panicles terminal; *ramifications* trichotomous, divergent.

Flowers numerous, small, whitish-yellow.

Perianth inferior, small, five-toothed.

Petals four, oval, spreading, concave, inserted by claws in the base of the nectary.

Nectary fleshy, contracted in the middle; the lower swelling receiving the petals and stamina, the upper supporting the germ.

Filaments eight, enlarged below, concave according to the convexity of the nectary and germ, shorter than the corol. *Anthers* oval.

Germ nearly square, crowned with four round glands, four-celled,

celled, containing two ovules in each cell attached to the axis. *Style* length of the stamina. *Stigma* truncated.

Berry oblong, pale straw-colour, marked with minute, greenish glandular dots, one-celled.

Seed solitary, conform to the berry. *Integument* single, thin, white.

Perisperm none.

Embryo inverse, straight. *Cotyledons* conform to the seed, pale yellow, marked with small greenish dots. *Plumule* two-lobed *Radicle* oval, superior.—*Roxb. Mss.*

AMYRIS PUNCTATA. *Roxb.*

TAB. V. Fig. 3.

Native of Chittagong.

Trunk arboreous. *Branches* spreading. *Bark* smooth, ferruginous.

Leaves alternate, unevenly pinnate. *Leaflets* alternate, short petioluled; ten to twenty pairs, with an odd one; obliquely oblong, crenulate, marked with glandular dots: the largest leaflets in the middle of the common rachis, 3 to 4 inches long, 1 broad.

Stipules none.

Petioles and *petiolules* round, somewhat scabrous and hairy.

Panicles terminal, oval, erect. *Peduncle* and its subdivisions hairy.

Bractes minute.

Flowers numerous, small, white.

Perianth inferior, small, four-toothed.

Petals four, oval, spreading, concave, inserted by claws in the base of the nectary.

Nectary, a large, fleshy receptacle, contracted at the middle, receiving the petals and filaments inserted in the lower swelling, and supporting the germ with the upper.

Filaments

Filaments eight, much enlarged below, concave within, according to the convexity of the nectary and germ, shorter than the corol. *Anthers* oval.

Germ four-sided, four-celled, with two or three ovules in each cell, attached to the top of the axis. *Style* thick, four-sided, straight, length of the stamina. *Stigma* truncated, obsoletely four-pointed.

Berry oblong, size of a field-bean, smooth, dotted, of a pale straw-colour, one-celled.

Seed solitary, conform to the berry.

Integument single, white, thin, tender.

Perisperm none.

Embryo inverse. *Cotyledons* conform to the seed, green, often unequal. *Plumule* two-lobed, hairy. *Radicle* hemispherical, hairy, inferior.—*Roxb. Mss.*

Bergera integerrima. *Buch.*

Indigenous in countries east of the Megna River in Bengal.

Trunk arboreous. *Branches* numerous.

Leaves alternate, unevenly pinnate. *Leaflets* subalternate, short-petioluled, obliquely lanceolate, entire, waved, acuminate, smooth above, villous underneath: exterior largest, 6 inches long, 2 broad.

Petioles round, villous.

Corymbs terminal, decompound.

Flowers short-pedicelled, erect, numerous, white, emitting a strong offensive smell.

Bractes very minute.

Perianth five-toothed.

Petals five, lanceolate, expanding.

Nectary a fleshy receptacle elevating the germ.

Stamina ten, alternately longer.

Germ above, oval, five-celled, with two ovules in each cell, attached to the upper end of the axis. *Style* clavate. *Stigma* subrotund.

Berry size of a large pea, oval, yellow, rarely more than two-seeded.

Seed solitary (sometimes two or more ripen) conform to the berry.—*Roxb. Mss.*

BERGERA KŒNIGII. *Linn. Mant. p.* 563. *Roxb. Corom.* ii. *p.* 9. *t.* 112.

TAB. V. Fig. 4.

Germ oval, a little compressed laterally, two-celled, containing one ovule in each cell, attached from its middle to the middle of the partition: a cellular enlargement above containing a limpid liquid.

Berry obliquely oval, smooth, size of a black currant, purple, marked with numerous pellucid cells; one-celled, by abortion of the second.

Seed solitary, conform to the berry. *Integument* single, white, rather thin.

Perisperm none.

Embryo inverse, green. *Cotyledons* conform to the seed, notched on the external side below the summit, and there united with the neck of the embryo by the bottom of the fissure. *Plumule* two-lobed. *Radicle* superior, cylindric, villous.—*Roxb. Mss.*

EXPLA-

Burseru serrata

Weddell sc.

Fig. 1.

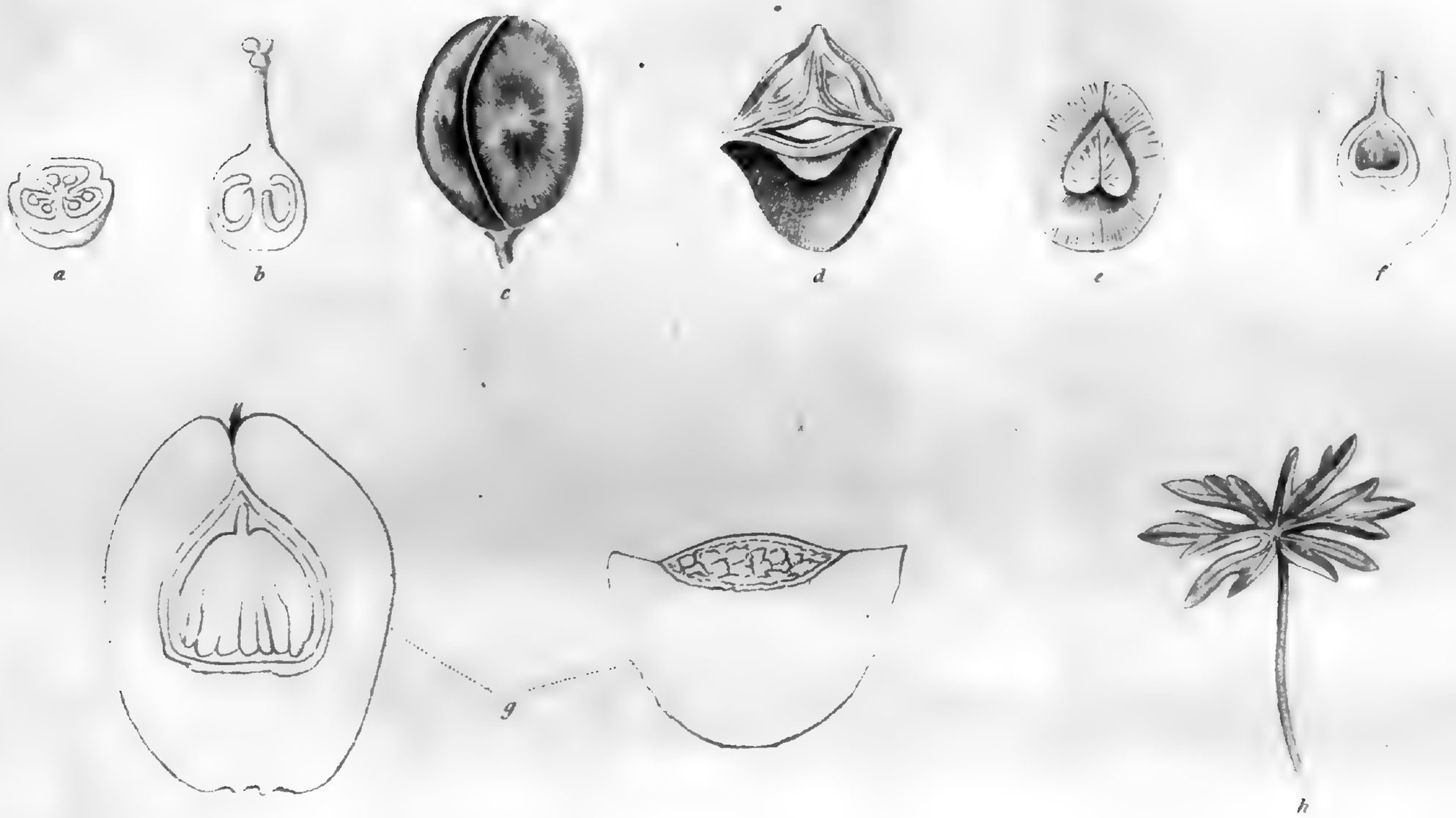


Fig. 2.

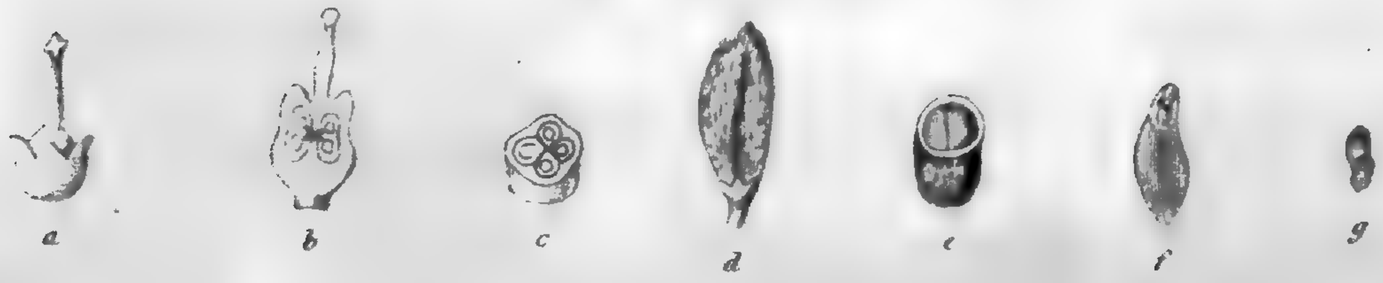


Fig. 3.

Fig. 4.

Wedderl. sc.

EXPLANATION OF THE FIGURES IN TAB. IV.

Fig. 1. *Bursera serrata*.

a. Front view of a flower.
b. Back view of ditto.
c. A peduncle with ripe berries.
d. Transverse section of a three-seeded berry, exhibiting an entire seed, a divided one, and the rudiment of a third.
e. A one-seeded berry, with part of the skin removed to show the arilliform pulp.
f. Two pyrenes, exhibiting the external umbilicus.
g. Vertical section of a seed;—natural size.
h. The same, magnified.
i. Seed with its integument and rhaphe.
j. Embryo viewed from the lateral and ventral sides.
k. Aspect of the embryo from the ventral side;—magnified.
l. Germinating seed.
m. The same more advanced.

EXPLANATION OF THE FIGURES IN TAB. V.

Fig. 1. *Boswellia serrata*.

a. Transverse section of the germ;
b. Vertical section of ditto; } both magnified.
c. The entire capsule.
d. A transverse section of the same.
e. A seed;—the natural size.
f. The same, with the integuments of one side removed.
g. Vertical and transverse sections of the seed, exposing the embryo;—magnified.
h. The young plant, with its many-cleft cotyledons expanded, and converted into seminal leaves;—natural size.

could take place: for there was no appearance of an opening at the extremity of the puparium (Kirby), nor could I detect the reproductive organs in the thoracic portion of the body, which might have been approached *inter nuptias*. While engaged in pressing and examining the male organs under the microscope, I discovered the extensile extremity of the penis, admirably adapted by its extraordinary length and flexibility for the sexual intercourse, which appears to terminate in the destruction of the male. It is highly improbable that the perfect insects have been seen in Europe; for no sooner has the male arisen from his pupal slumber, than he begins, even before the full expansion of his wings, to flutter about with so much violence that his beauty has commonly disappeared before the entomologist can secure him. It is well known to the European naturalist, that the females of several Lepidopterous insects are nearly apterous: but I believe all at present described possess the rudiments of wings and antennæ, with perfect feet. The female of *Phalæna antiqua* of Linn., which I have often collected when a boy, not only quits the folliculus, but, *copulâ juncta*, enjoys with its partner the pleasures of the open fields. Here, however, we have an animal which in its adult state is for ever excluded from the light, and never even beholds the mate to which it is indebted for its progeny. After impregnation, the female begins to fill the bottom of its puparium with her ova closely packed in the down rubbed from her body; and having performed this duty, either presses herself through the thoracic carina, reduced to a shrivelled morsel of dried and scarcely animated skin, or dies within the case.

The young soon force their way out of the puparium which had served for the defence of the ova, and spreading about the tree (an innumerable host), prepare themselves an habitation before their first repast.

Ordo.

Ordo. LEPIDOPTERA.

Tribus. *NOCTURNA.* Lat.

Genus. *OIKETICUS.*

Mas. *Os* simplicissimum, *lingua* aut nulla aut omnino intra os retracta.
Labium partitum, rami apice squamosissimi.
Abdomen extensile, elongatum.
Glans penis longitudine corporis, extensilis, non retractilis? spinulis recurvis sparsis.

Fœm. *Imago* semper pupicola, obesa, segnis, aptera.
Aures? duæ frontales, excavatæ, indistinctæ.
Os simplicissimum.
Lingua nulla.
Palpi nulli.
Antennæ nullæ.
Pedes spurii, brevissimi, apice truncati.
Unguiculi nulli.
Thorax vix distinctus, segmentis quatuor? cute pergameneâ tectus.
Ovarium ferè magnitudine abdominis.
Pupa subcoarctata, *carinâ thoracicâ* superiori mox dehiscente ad marem recipiendum.

Larva obesa, pilis sparsis. *Mandibulæ* validissimæ. *Ocelli* plurimi. *Labrum* emarginatum. *Antennulæ* setigeræ. *Palpi* duo apice appendiculati. *Pedes* sex validissimi ad januam claudendam (hostibus appropinquantibus). *Propedes* decem, duobus analibus. *Colus* (instrumentum textorium) extensilis, setâ utrinque unicâ, apice perforatus; dum pascit animal in fossulâ gutturali reconditus.

Habitaculum

*Habitaculum** cylindraceum, utrinque apertum, filis textum et ramulis foliisque morsis munitum. *Larva* metamorphosin subiens (apice semper aperto ad fugam imaginis masculæ, et ad nuptias fœminæ), januam clausam filis ad ramum deligat, capiteque prono somnum expectat.

Pupa mascula fronte productâ adminiculis analibus duobus majoribus incurvis: segmentis abdominalibus serie unicâ spinularum incurvarum, unicâ recurvarum.

Regio. India Occidentalis.

Genus affine Zeuzeræ? *Lat.*

Typus genericus. Oiketicus *Kirbyi, Nobis.*

OIKETICUS KIRBYI.

♂. O. ater purpureo-nitens, alis superioribus elongatis: inferioribus angulo anali subproducto; antennis dimidiato-pectinatis apice serrulatis: tarsis rufescentibus: ore pallido.

♀. O. oculis rufescentibus: thoracis squamis corporisque squamulis vitellinis: collo anoque brunneo lanuginosis.

Larva obesa pedibus atris latissimis, propedum musculus retractorius apice ferrugineo, spinulæ prehensoriæ atræ recurvæ. *Corpus* parcè pilosum segmentis duodecim, lateribus prominulis: anterioribus tribus capiteque rotundato flavescen-

* The habitaculum or dwelling of the larva of insects must be distinguished from the folliculus or cocoon, which is solely prepared for the defence of the pupa, and closed on all sides. It is observed in the *Tineadæ* and other insects, but is commonly of a flattened shape. In one Trichopterous? species known to me it is flattened ovate, open at the ends, and fixed to rocks in rivers. In a species of the family *Botydæ* which I have lately detected in vast numbers in our mountain streams, it is flattened, irregular, and attached by the margin and two pillar-like processes to the rocks below the surface of the water. It possesses a semicircular janua for the escape of the imago, and is fenestrated on the margin. The larva of this curious moth breathes by tracheal branchiæ!!

tibus,

tibus, brunneo pictis: reliquis obscuro-lividis. *Tracheæ* ferrugineæ. Raro Ichneumonibus infestatur.

Ovum rotundatum, parvum, flavicans.

Pullus caudâ erectâ, mox horizontali propter habitaculi pondus. Ab ovo erumpens extemplo folia scindit, filisque emissis domum format, formicas timens omnivoras feroces.

Habitaculum maximum, fœmininum majus.

Larva exterrita *januam* bursiformem mandibulis pedibusque citissimè claudit, ac sic filis paucis suspensa tutam manet.

Pupa mascula elongata brunnea, segmentis abdominalibus ferrugineo circulatis, fronte subcarinatâ, dorso bisetoso.

Pupa fœminina concolor, obesa, adminiculis analibus asperis, segmento unico spinuloso, cæteris margine crenatis.

Habitat hortorum pestis in Terminaliis aliisque arboribus vorax.

In honorem amici G^i^. Kirby, Soc. Reg. et Linn. Socii, Entomologorum Angliæ ducis indefessi, oculatissimi.

Oiketicus Macleayi.

♂. O. niger, alis latis rotundatis; antennis totis pectinatis: pene ferrugineo.

♀. O. flavescens, flavo lanuginosa.

Larva caudâ semper erecta: segmentis tribus anterioribus thoracicis, capiteque flavis brunneo pictis; reliquis obscuris, verrucis elevatis pallidis sparsis.

Var. β. pallidior.

Pupa mascula fronte productâ, segmentis antice sordidè-rufescentibus.

Pupa fœminina vitellina, fasciis quinque nigris, ano simplici.

Habitat larva inter ramos truncosque vetustos vix noxia: habitaculum spinulis lichenibus pulchrè nonnunquam decorans.

Tertia species ni fallor mox describenda.

Amico G°. S. MacLeay, Soc. Linn. Socio, naturæ scrutatori doctissimo,—interpreti celeberrimo, hæcce species novi generis meritò dicatur.

EXPLICATIO TABULARUM.

TAB. VI.

Fig. 1. *Oiketicus Kirbyi* mas paululum auctus. *a*. Tarsus.
Fig. 2. Penis glande longissimo, spinulis recurvis tectus ad arctiorem copulam. *b*. Penis lamellæ supernè visæ. *c*. Penis corpus corneum. *d*. Penis infernè visus cum lamellis. *e*. Lamella lateralis cum appendice hirsutâ.
Fig. 2*b*. Caput auctum palpis vi reclinatis. *a*. Antenna aucta.
Fig. 3. Magnitudo naturalis.
Fig. 4. Pupa mascula aucta. *a*. Pars auctus cum duplici serie spinularum dorsalium.
Fig. 5. Alæ cum fibulâ humerali in situ.
Fig. 6. Fœmina magnitudine naturali. *a*. Caput. *b*. Oculus*.
Fig. 7. Eadem ad latus visa. *a*. Pes auctus.
Fig. 8.8.8. Oviductus.
Fig. 9. Pupa fœminina. *a*. Spinulæ. *b*. Carina thoracica. *c*. Facies.
Fig. 10. Puparii sectio ovis repleti.

TAB. VII

Fig. 1. Ova magnitudine naturali et aucta.
Fig. 1*a*. Ova immatura, ovario extracta

* In a *single* specimen something like the rudiments of antennæ were visible beneath the eyes, as in this figure.

Fig.

Trans. Linn. Soc. Vol. XV. Tab. 6. p. 370.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Lansdown Guilding del.t

Ciketicus Kirbyi.

C. Fox sculp.t

Trans. Linn. Soc. Vol. XV. Tab. 7. p. 376.

Fig. 1.

1 a

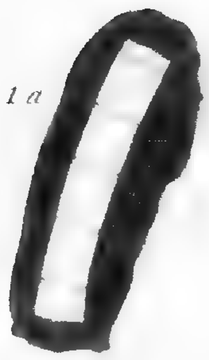


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 7.

Fig. 6.

Fig. 8.

Fig. 9

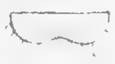


Fig. 10.

Fig. 11

Fig. 12.

Fig. 13.

Lansdown Guilding del.

C. Fox sculp.

Cibdelus Kirbyi

Trans. Linn. Soc. Vol. XV. Tab. 8. p. 577.

Fig. 1.

Fig. 2.

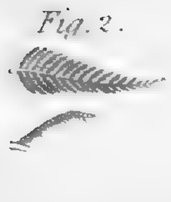


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

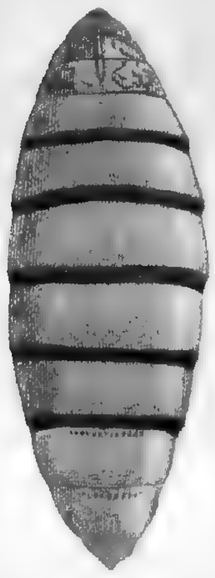


Fig. 7.

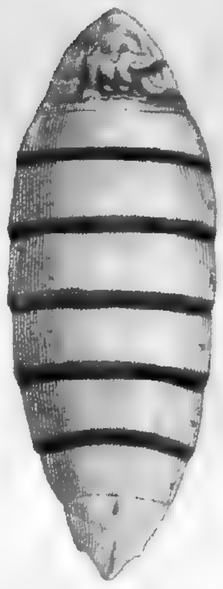


Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

Fig. 13.

Fig. 14.

Lansdown Guilding del.

Oiketicus Macleayi.

C. Fox sculp.

Fig. 2,3. Larva junior aucta.
Fig. 4. Eadem habitaculo nuper ædificato.
Fig. 5. Habitaculum maris adulti ante metamorphosin ramo filis arctè affixum.
Fig. 6. Larva fœminina serpens.
Fig. 7. Eadem nuda. *a*. Propes auctus cum musculo retractorio. *b*. Spinulæ ad latus visæ.
Fig. 8. Caput auctum. *a*. Ocelli. *b*. Labrum. *c*. Antennulæ. *d*. Palpi. *e*. Colus. *f*. Mandibulæ.
Fig. 9. Labrum auctum, abscissum.
Fig. 10. Antennula abscissa.
Fig. 11. Colus et (palpus *a*). *b*. Coli articulus extimus tubiformis. *c*. Filum emissum.
Fig. 12, 13. Mandibulæ utrinque visæ.

Oiketicus Macleayi.

Tab. VIII.

Fig. 1. Mas paululum auctus.
Fig. 2. Antenna cum dente unico abscisso.
Fig. 3. Magnitudo naturalis.
Fig. 4. Pupa mascula. *a*. Segmenta spinulosa. *b*. Longitudo naturalis.
Fig. 5. Alæ cum fibulâ in situ.
Fig. 6, 7. Pupa Fœminina aucta, utrinque visa.
Fig. 8, 9. Fœmina natura aucta.
Fig. 10. Larva junior.
Fig. 11. Larva aucta.
Fig. 12. Habitaculum auctum.
Fig. 13. Idem clausum et suspensum, magnitudine naturali.
Fig. 14. Ova magnitudine naturali, et aucta.

XV. *Observations on the Tracheæ of Birds; with Descriptions and Representations of several not hitherto figured. By William Yarrell, Esq., F.L.S.*

Read February 6, 1827.

The various qualities and powers of voice exhibited by birds in general, and the diversity of structure known to exist in the tracheæ or windpipes of different species in some particular families, have justly excited the attention and remarks of several writers. Dr. Latham, in the 4th volume of the *Transactions* of this Society, has furnished descriptions and illustrations of the peculiarities of this part in some of those species most remarkable for their deviation from the common form; and to his paper I shall occasionally take the liberty to refer.

To other sources ornithologists are indebted for delineations not included in the essay before mentioned: and the present communication, accompanied by drawings of several tracheæ not hitherto figured, will, I trust, be considered an acceptable addition on this interesting subject.

The peculiarities in the form, as well as in the composition, of the several parts of the windpipes of birds, having already been described under the different names of the glottis, or superior larynx; the tube; the bone of divarication, with its cross-bone forming the lower end of the tube; and lastly, the bronchia, by which the bone of divarication is connected with the lungs;—I shall proceed at once to the descriptions of those new forms of tracheæ which are the subject of the present communication.

The

The Crested Pintado of Africa, the *Numida cristata* of Pallas, described and figured in Dr. Latham's *General Synopsis*, vol. iv. p. 638, and in his *General History*, vol. viii. p. 148, exhibits an extraordinary structure, to which I shall first advert. That part of the os *furcula*, or merrythought as it is more commonly called, which in our common Guinea Fowl consists of a single flat blade descending from the apex or junction of the two branches, is in this bird double, one side appearing to extend from each branch; it is also somewhat circular, and united at the edges throughout the greater part of the circumference, forming a socket or pouch. The trachea, quitting the neck of the bird at the lower curve of the cervical vertebræ, passes downward between the branches of the furcula, enters the pouch at the lower part of the orifice, traverses the inner surface, and issuing from the upper part, rises with a circular sweep, upward and forward to the projecting anterior portion of the sternum, over which it turns backward to pass into the body; guided in its course by two semi-transparent membranes, stretching from this projection of the sternum to the head of each clavicle.

If a line be drawn from the commencement of the trachea, as shown in the figure, to the bronchia, passing between the scapulæ, it will describe the situation of the trachea in our common domestic Guinea Fowl, and the variation of the crested bird will appear the more extraordinary by comparison.

For the opportunity of figuring this singular structure, I am indebted to the liberality of the Board of Curators of the Royal College of Surgeons, and to the friendship of Mr. W. Clift, jun., for a beautiful drawing from a specimen in the Museum of the College, the only one I ever had an opportunity of examining. From that drawing the one now annexed is a close copy.

M. Temminck has described this bird in his *Histoire Naturelle Générale des Pigeons et des Gallinacés*, vol. ii. p. 448, under

under the name of *Peintade Cornal*, but does not mention the anatomical structure.

Dr. Parsons has given a representation of the trachea of the Demoiselle (*Ardea Virgo* of Linnæus) in the 56th volume of the *Philosophical Transactions*, from which Dr. Latham copied his figure: but as the true character of this trachea is less perfectly understood by a detached figure, and as this figure moreover is somewhat incorrect in the form of the bronchia, I have ventured to add a drawing of the sternum of this bird with its trachea *in situ*, the better to compare it with the structure of the same part in the very rare bird that will follow. In the present instance, the trachea, quitting the neck passes downward between the branches of the furcula toward the anterior edge of the keel, which is hollowed out to receive it; into this groove, formed by the separation of the sides of the keel, the trachea passes, and is firmly bound therein by cellular membrane. In the figure annexed, a small portion of one edge of the keel is removed, to show the depth of the insertion. The usual form of furcula does not prevail in this bird: it is not here, as in most others, a detached bone, but has the point of union of the two branches firmly ossified to the keel, or may be considered as a prolongation of the keel itself, extended to the head of each clavicle, and affording a firm support to the wing. The peculiar formation of the trachea, and its insertion within the keel of the sternum in this bird, may be considered as exhibiting the commencement of that structure, which, with some modification in a second species, is carried to its greatest extent in the Cranes.

One example only of the rare bird above mentioned appears to have been brought alive to this country; and this specimen will be found described and figured by Mr. Vigors in the second volume of the *Zoological Journal*, page 234, under the name of *Anthropoïdes Stanleyanus*. It is fortunate for science, that the notice

notice of this new and interesting species should have been furnished by a gentleman so eminently distinguished for his acquirements as a naturalist and a scholar. Possessing as this bird does in a great degree the external characters of the Demoiselle, it also bears some resemblance to it in its anatomical structure. The trachea, quitting the direction of the vertebræ of the neck at the lower part, passes downward and backward between the branches of the furcula till it reaches the anterior edge of the keel; it then turns upward into a groove formed for its reception, and being suddenly reflected forward and downward, traverses the projecting portion of the sternum, and passes backward to the lungs, as shown in the annexed representation. The furcula, it will be observed, is similar to that of the Demoiselle.

Dr. Latham's figure of the sternum and trachea of the Common Crane (*Ardea Grus*) being referred to, and compared with the same parts in the Demoiselle and the Stanley Crane, it will be perceived, that the insertion of the windpipe in the latter bird is upward, that of the Demoiselle principally backward, while that of the Common Crane will be found to be a compound of both, combining the upward inclination of the one with the backward insertion of the other; and the depth of this insertion within the keel appears to depend on the age of the bird rather than the sex. In a very old female, of which I prepared the bones, the insertion is carried to the utmost extent that the size of the sternum will admit. In a second specimen of a younger male bird, the insertion was not so deep as in that last mentioned, but still much more so than in the sternum represented by Dr. Latham: and in the valuable and extensive collection of Joshua Brookes, Esq., to which that gentleman very kindly allows me access, there is a skeleton of the Common Crane,—evidently a young bird by the state of the bones,—in which the insertion is not carried so far as in the representation alluded to; but

but in a male and female of the same age, the greater depth of insertion may occur in the male, as stated in Dr. Latham's paper. The furcula and bronchia also of the Common Crane exactly resemble those of the Demoiselle and Stanley Crane, as might be expected in birds so nearly allied. Before quitting the subject of the *Anthropoïdes Stanleyanus*, it is necessary I should state, that this very rare bird passed when dead into the possession of Mr. Leadbeater, to whose liberality I am indebted for the opportunity afforded me of preparing and figuring part of the bones, and to whom I with pleasure acknowledge my obligations for many other interesting objects of investigation. The Indian Crane, *Ardea Antigone* of Linneus, has the same form of trachea and sternum as the Common Crane of Europe, *Ardea Grus*.

The Black Swan of New Holland, the *Anas Atrata* of Linnæus and others, gives me an opportunity of showing a structure intermediate between the two most admired species of the genus *Cygnus* of Cuvier, the common mute Swan, the stately ornament of our lakes and rivers, and our more scarce winter visitor the Hooper.

In the Black Swan the trachea quits the neck at the bottom, and descends to the centre circular portion of the furcula, to which bone it is firmly bound by a tough membrane; the remaining portion then rises over the front of the breast bone between the clavicles, and passes backward to the lungs, the last portion of the tube immediately preceding the bone of divarication being flattened horizontally. The form of the trachea in our common Swan, in which it follows the neck without deviation, being remembered, and Dr. Latham's figure of the wild Swan referred to, it will be observed, that the Black Swan exhibits an interesting link between the two, and has not, that I am aware, been either described or figured.

The

Two opportunities having lately occurred to me of examining the structure of the Semipalmated Goose (*Anas semipalmata*) of Dr. Latham, who in his *Synopsis* and *General History* has given a figure of the bird and its trachea, I trust that the anatomical peculiarities I shall be able to exhibit as belonging to this bird beyond those already described, will be a sufficient reason for adding two representations of parts of both the birds above noticed, with some observations on each; premising, that the situation of the specimen referred to by Dr. Latham, that of a preparation in the collection of Mr. Heaviside, and the additional circumstance of two male birds of the same species presenting two decidedly different conformations of the same organ, will sufficiently account for the difference in the two statements.

TAB. XIII. is an exact representation of the form of the trachea in the first male of the two specimens I examined. It was situated on the outside of the left pectoral muscle, under the skin, and extended the whole length of the side, sufficiently raised under the wing that respiration would not be impeded when the bird rested with its breast on the ground; the parallel tubes being firmly attached both to the muscle and the skin by cellular tissue. These parallel tubes are placed in a more vertical position in the drawing than when attached to the bird, in order to bring the whole of them into view. The additional peculiarity of structure to be observed in this bird is the different formation of one clavicle as compared with the other. The clavicle on the right side of the bird is of the usual character; but that on the left is both shorter and wider, having an aperture about the middle, the sides diverging, with a projecting point on the inner side, to which the tube of the trachea is firmly attached about two inches above the bone of divarication. The trachea lying on the left side of the bird, the lower portion of the tube in its passage to the lungs crosses the left branch of the furcula

cula at a right angle; but becoming attached to this projection of the clavicle, receives from the point described its centrical direction into the body. The whole length of the windpipe in this bird is 4 feet 8 inches.

TAB. XIV. is a representation of the trachea of the second bird before referred to, and was also a male. It will be observed to want part of the interesting character of the first specimen, which the particular direction occupied by the leading portion of the tube in this second renders unnecessary: but the enlarged clavicle in this bird is on the right side, having a similar projection on its inner surface, forming a point of attachment for the tube, and performing the same office as in the other instance. It will remain for future investigation to show, whether in those male birds possessing the extra convolutions of the trachea, the enlarged clavicle is uniformly on the left side, and *vice versâ*. Four species of birds belonging to the Gallinaceous tribe have been figured by Dr. Latham as possessing convolutions of the trachea of various extent on the outside of the pectoral muscles: the same parts have also been represented on a larger scale by Mons. Temminck in his *Histoire Naturelle Générale des Pigeons et des Gallinacés*, and are described as possessing voices exceedingly harsh and loud. In this particular the Semipalmated Goose agrees perfectly; and in those species of Cranes and Swans already referred to, the power and depth of tone will be found to increase with the elongation of the tube.

Of the true physiology of these variations in form and lengthened convolutions little is known: that a connection exists between the sexual organs and those of the voice many proofs might be adduced; and it is not the least singular property of these singularly formed windpipes, that the more complicated the structure of the tube, the more disagreeable is the sound of the voice, the simple forms belonging to our most delightful song-birds.

The

The different species of Geese considered British, present nothing remarkable in their tracheæ, the Egyptian Goose alone excepted. The male of this bird possesses a bony enlargement at the bottom of its windpipe, in size equal to that marked (*a*) in TAB. XV. Systematic authors seem to agree in placing this bird at the bottom of the list of the Geese, where it appears to occupy its proper situation.

Combining as it does some of the characters common to those birds and the true Ducks, it becomes a very natural link between them; and with a few observations on an arrangement of the British species of the latter portion of this family, founded upon internal as well as external conformation, I shall close this paper.

The first division of true Ducks will contain the Shielduck, Muscovy, Wild Duck, Gadwall, Shoveler, Pintail, Wigeon, Bimaculated Duck, Garganey, and Teal,—all of which will be found to have the following characters in common. Externally they exhibit considerable length of neck: the wings are also long, reaching to the end of the tail; the tarsi somewhat round; the hind-toe free, or having no pendent lobe. In habits they may be stated generally as frequenting fresh-water, but passing much of their time on land, feeding in ditches and about the shallow edges of pools on aquatic plants, insects, worms, and occasionally fish, taking their food at or near the surface; possessing great powers of flight, but seldom diving, unless pursued. Of their internal soft parts, the stomach is in the greatest degree muscular, forming a true gizzard; the intestines long, the cæcal appendages from six to nine inches in length in the larger birds, and decreasing only in proportion to the size of the species. Of the bones it may be observed, that the ribs are short, extending but little beyond the line of the posterior edge of the sternum; the keel of the breast-bone deep, affording great ex-

tent of surface for the insertion of large and powerful pectoral muscles; the enlargement at the bottom of the trachea in all of them is of bone only. The Wild Duck may be considered the type of this division.

The Eider Duck, King Duck, Velvet Duck, and Scoter, possessing some characters common to the preceding class, and others belonging to that next in succession, appear to supply the link between these two divisions. I regret that the extreme rarity of three of the species last named has hitherto prevented my obtaining any examination beyond that afforded by the external part of preserved specimens in collections; and I am therefore unable to state their comparative structure.

The next division of true Ducks includes in the following order the Red-crested, the Pochard, Ferruginous, Scaup, Tufted, Harlequin, Long-tailed, and Golden Eye; and their general distinctions, internal as well as external, compared with those of the birds of the first division, will be found of an opposite character. Externally they exhibit the neck and wings short, the latter only reaching to the origin of the tail-feathers; the tarsi short and compressed; the hind-toe lobated, and an extended web to the inner toe. They frequent the sea, or the deep parts of the largest fresh-water lakes, and have been called oceanic Ducks; seldom seen on land; their walk embarrassed from the backward position of the legs, but dive constantly and with great facility, taking their prey at various depths below the surface; their food finned and shell-fish, marine insects, but little or no vegetable production; their powers of flight moderate. Of their soft parts, the œsophagus is capable of great dilatation; the stomach is a muscular gizzard; but the internal cavity increases in size, those of the Long-tailed Duck and Golden Eye most resembling the stomach of the Mergansers; the intestines and cæcal appendages are shorter,

the

the latter diminishing from six inches in the first to four and a half in the Tufted Duck, three inches in the Long-tailed, and but two in the Golden Eye. The ribs of the birds of this division are elongated; the keel of the breast-bone gradually decreases in depth; the position of the wings is more forward, the legs placed further back. The tracheæ of these Ducks are particularly distinguished from those of the others by the enlargement at the bottom of the tube being covered with a delicate membrane, supported by slender portions of bone; the trachea of the Red-crested Duck (TAB. XV. *e*.) is an example of this form, and may be considered the type of this division. As the Egyptian Goose has in this arrangement been considered the link between the Geese and the first division of the true Ducks, from its possessing, with the characters of the former, the bony enlargement of the trachea common to the latter; and the Velvet Duck, for similar reasons, supplying the link between the two divisions of true Ducks, possessing, among other characters, an altered form of the bony enlargement of the trachea of one, with the lobated toe of the other; so the Golden Eye, the last of the series, appears to complete the arrangement, by exhibiting some of the characters found in the Mergansers, which are next in succession. The first point of similarity is in the elongated feathers on the top of the head, forming a crest; they agree also in the shape of the sternum, and a particular extension of its posterior edge, becoming an ensiform process, the appearance of which in the Goosander is represented in TAB. XV. marked (*g*): and this extension of the edge of the breast-bone prevails in the species of the genera *Colymbus*, *Alca*, and *Uria*; and with the elongation of the ribs observable in all good salt-water Divers, seems intended as a protection to the important viscera of the abdomen, and enables them to resist pressure when below the

the surface. In its stomach, intestines, and cæcal appendages, the Golden Eye is also intermediate, the latter being only two inches in length. In the Goosander these appendages are three inches; but the size of the bird being considered, reduces them on a comparative estimate to less than two: in the Red-breasted Merganser they are but one inch; the Smew is without any. In the form of its trachea, the Golden Eye more closely resembles the Mergansers than that of any other Duck, by the enlargement in the tube, and in the shape of the labyrinth, as a reference to Dr. Latham's representations will show. Thus the whole of the numerous species of the *Anatidæ* appear to descend to the more perfect water-birds by gradations, but with well-marked divisions throughout.

How far I am correct in an arrangement not strictly in accordance with the published systems of ornithologists, I must leave to better judges to determine; assuming, however, that an arrangement will be the more natural according to the proportion in which it combines ascertained habits, external characters, and anatomical structure*.

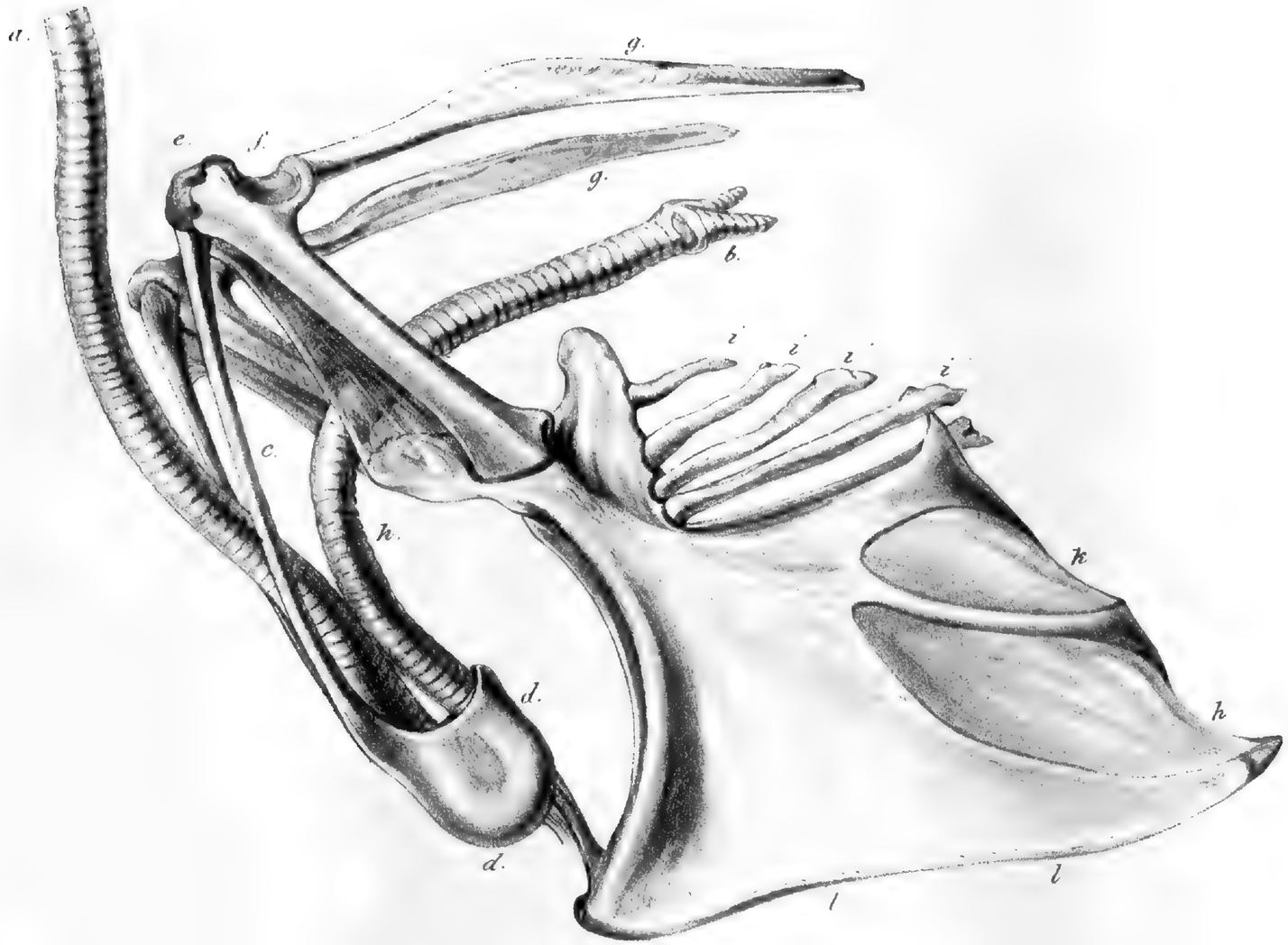
* The following extract is made from the 68th number of Mons. Temminck's *Planches Coloriées*, recently received in this country, Article 406.

HYDROBATES LOBATUS, *Temm.*

" Nous avons cru nécessaire de separer des canards proprement dits, et de réunir sous la dénomination mentionnée, toutes ces espèces à doigt postérieur garni d'un rudiment de membrane, vu que le squelette de ces oiseaux nous offre des différences marquées et constantes; que leur manière de vivre et le choix des alimens ne sont pas les mêmes que chez les canards à doigt postérieur lisse, et que des caractères faciles à saisir fournissent de très-bons moyens pour établir la différence générique entre ces deux groupes. Nous renvoyons tous les détails sur l'organisation et les mœurs à l'article contenant les généralités et l'Index du genre *Hydrobate.*"

The description of the generic characters and other peculiarities has not yet appeared.

EXPLA-



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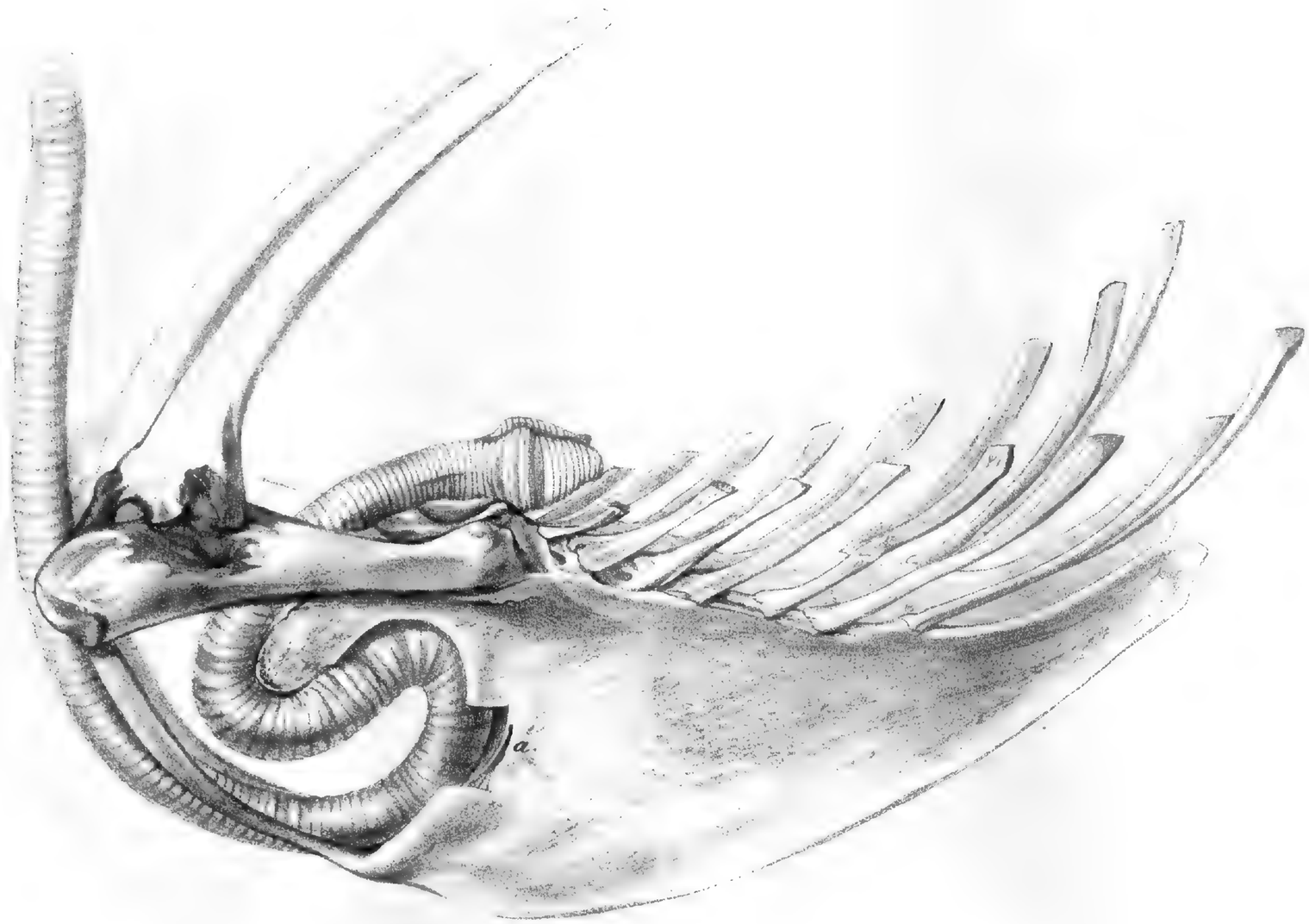

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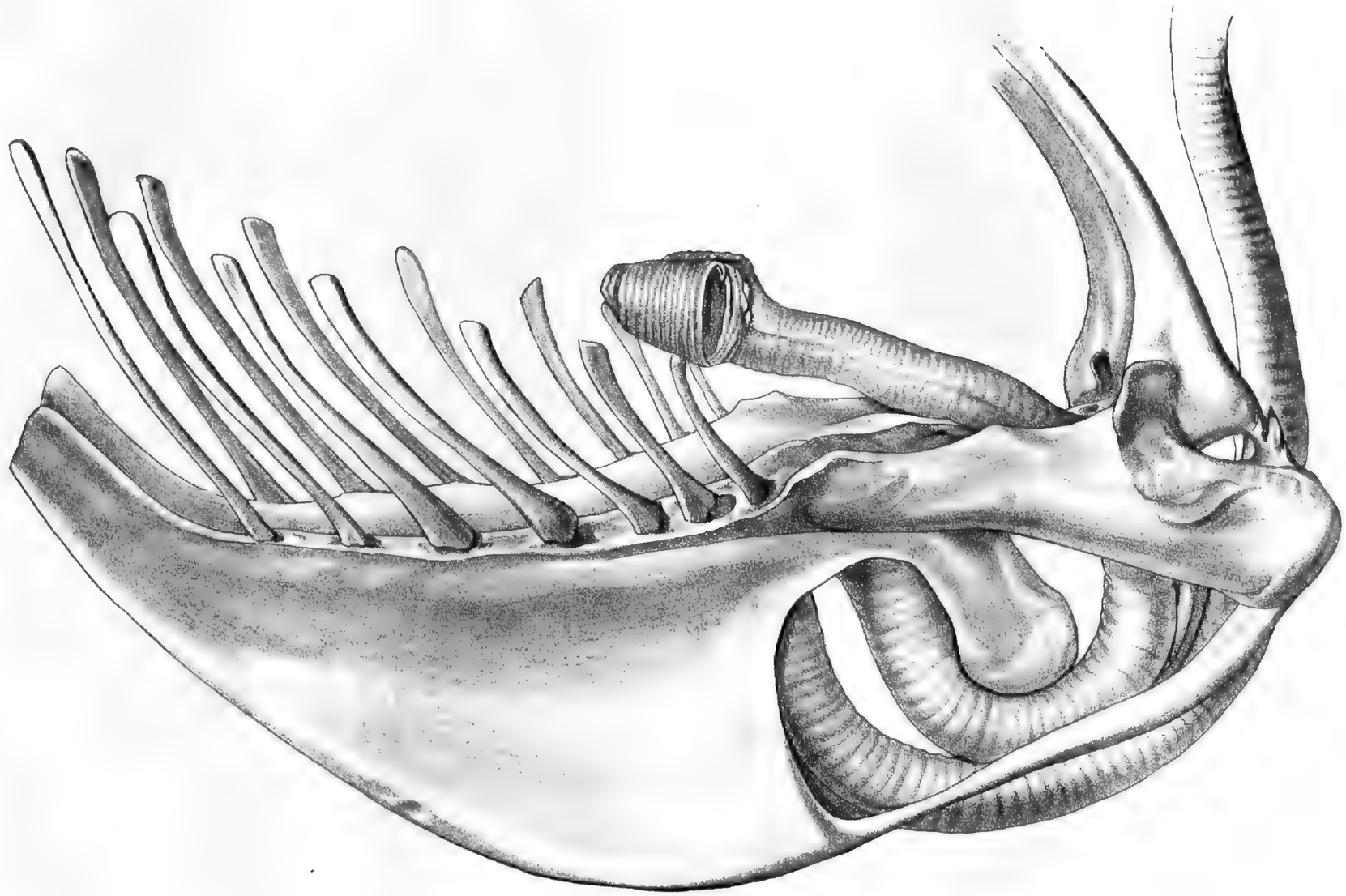

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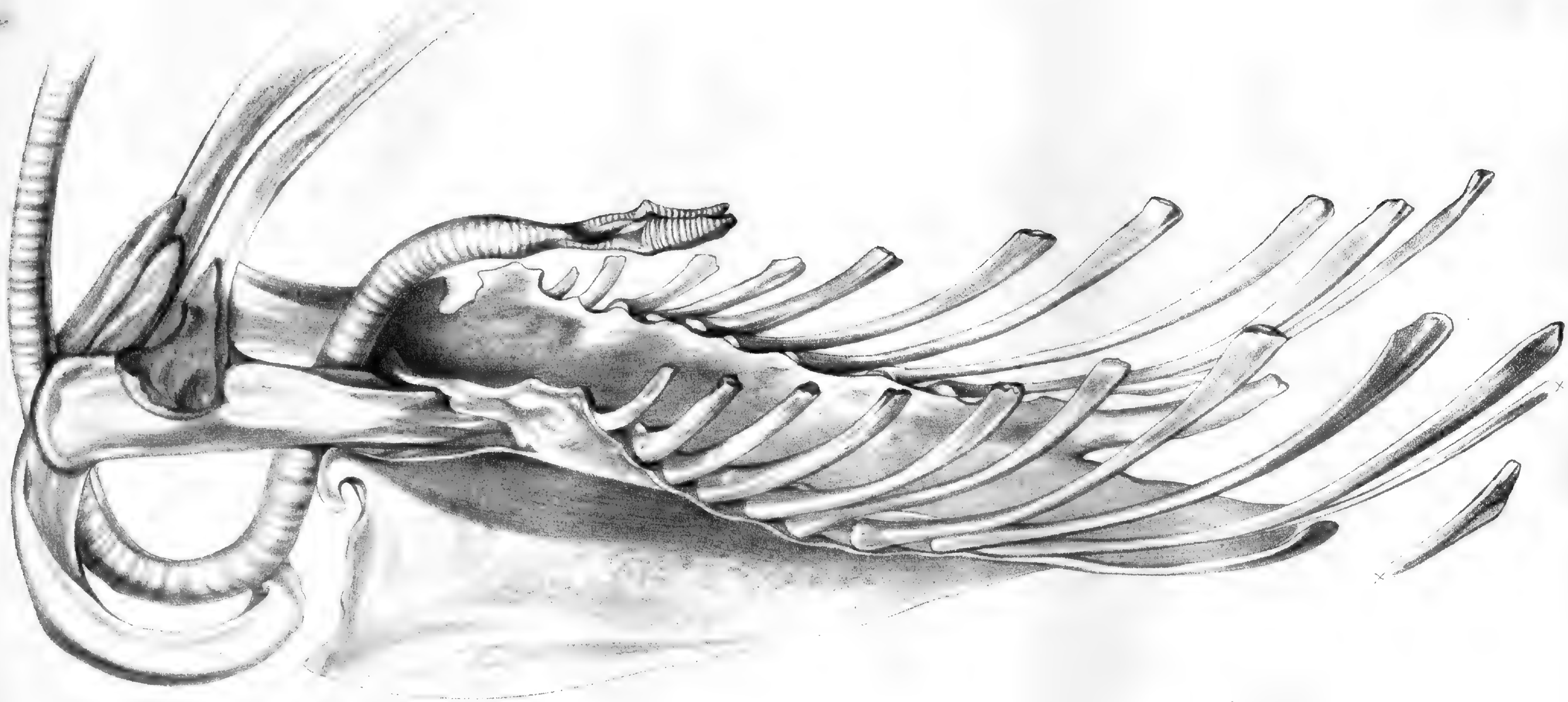

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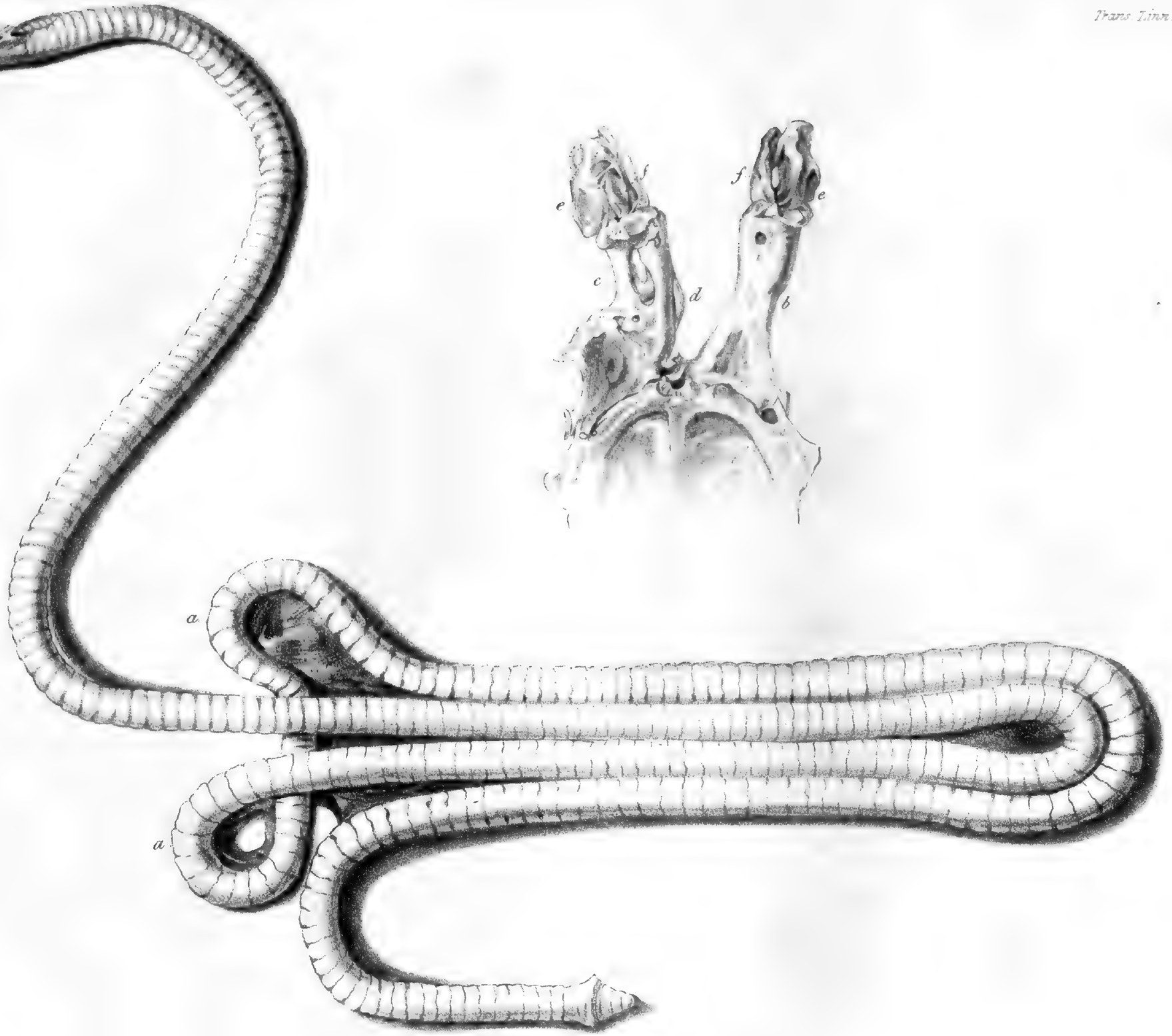

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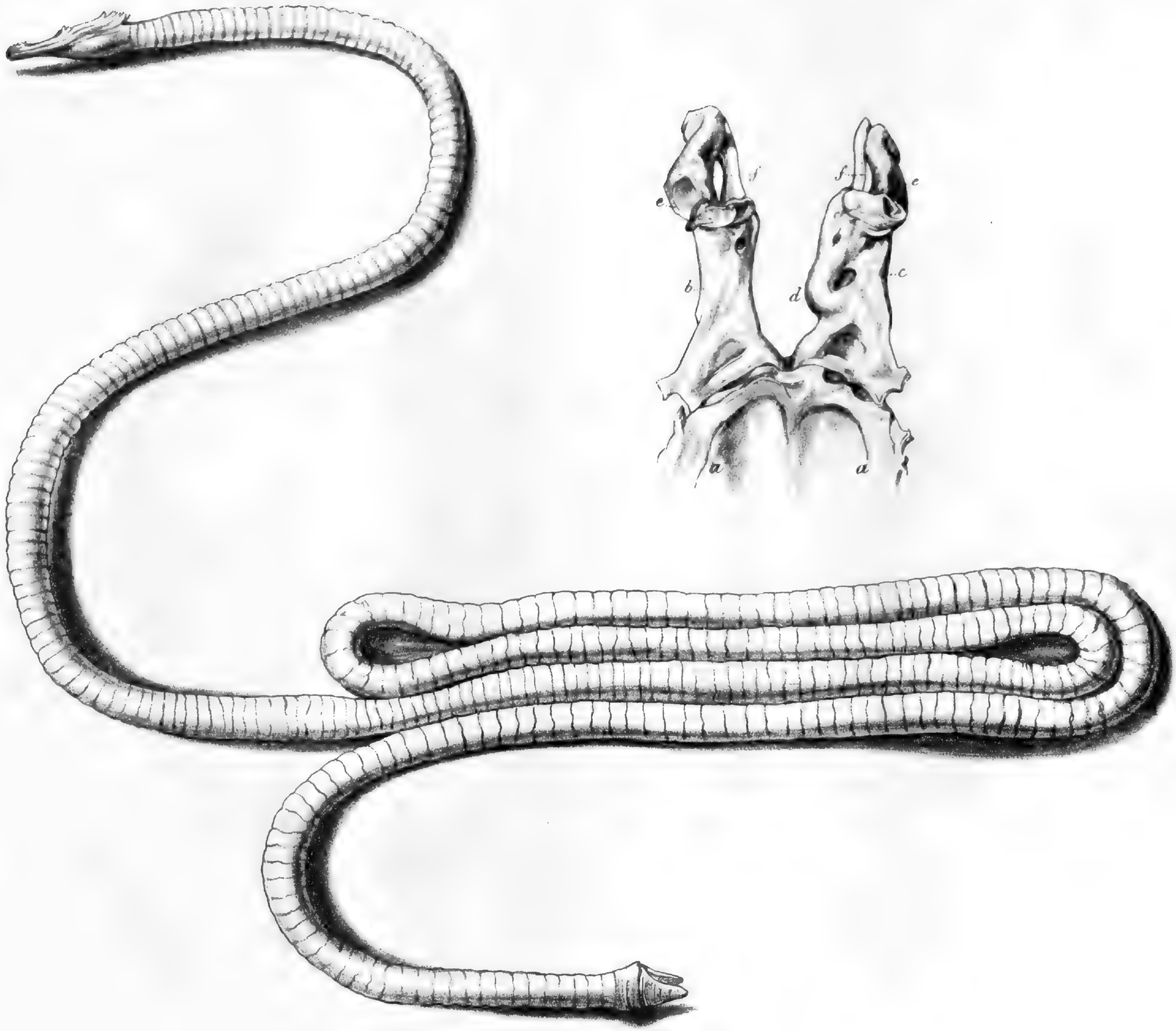

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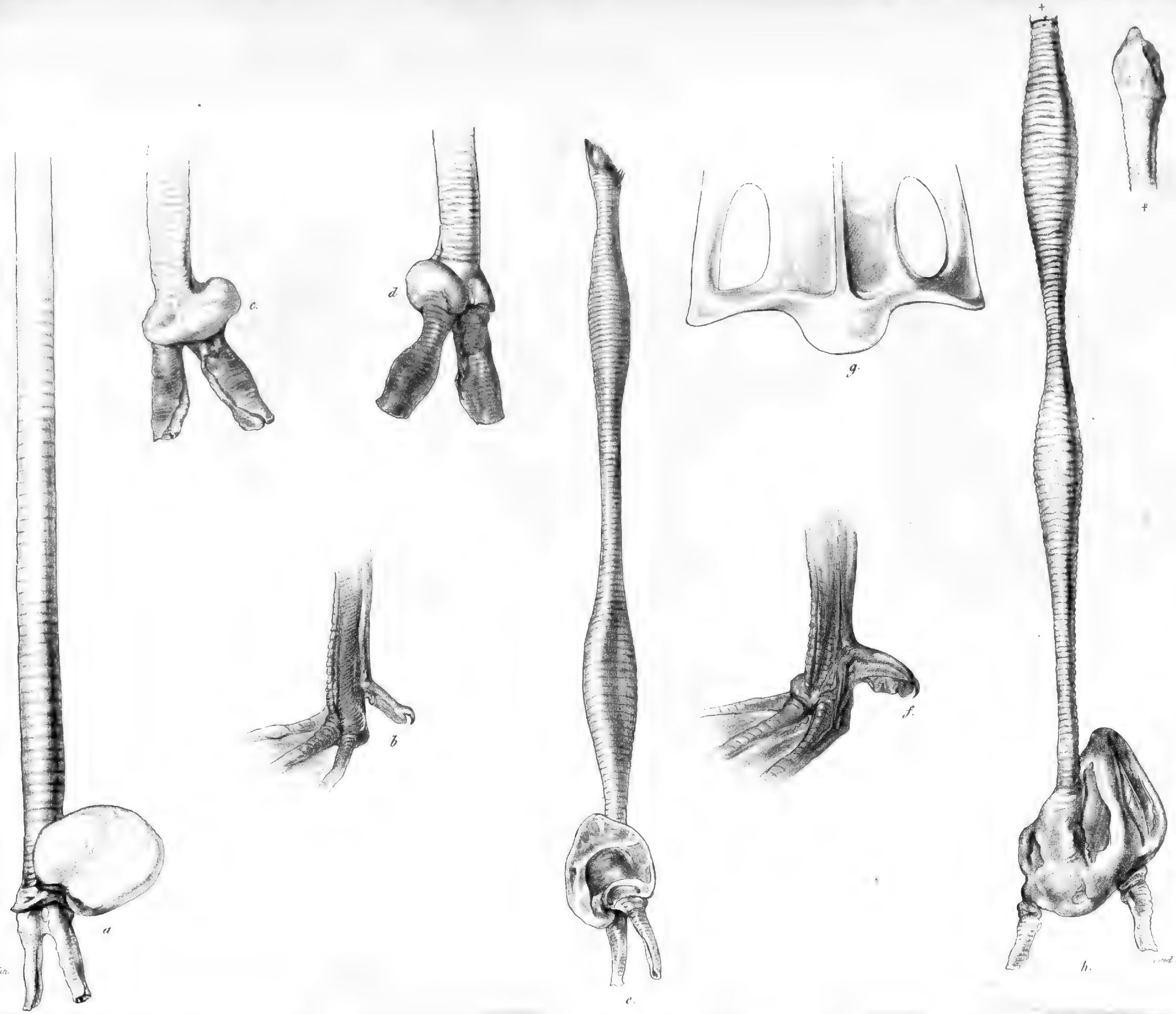

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EXPLANATION OF THE PLATES.

Tab. IX.

Sternum and Trachea of the Crested Pintado (*Numida cristata* Linn.).

a. Portion of the tube of the trachea, passing downward to the pouch and afterwards to *b*. the bone of divarication from which the bronchiæ arise.

c. *c*. The branches of the furcula. *d*. The pouch or socket.

e. The head of the clavicle. *f*. The junction of the scapula with the clavicle, forming a cavity to receive the head of the humerus. *g*. *g*. The scapulæ.

h. Projecting anterior portion of the sternum. *i*. *i*. *i*. *i*. The ribs.

k. *k*. Membranous portion of the sternum, common to the Gallinaceous tribe.

l. *l*. The keel or crest.

Tab. X.

Sternum and Trachea of the Demoiselle (*Ardea Virgo* Linn.).

a. A small portion of the keel removed, to show the depth of the insertion.

Tab. XI.

Sternum and Trachea of the Stanley Crane (*Anthropoides Stanleyanus* Vigors). Male.

Tab. XII.

Sternum and Trachea of the Black Swan (*Anas atrata* Linn.).

a. The depression in the tube, at the part preceding the bone of divarication.

Tab. XIII.

Trachea and Clavicles of the Semipalmated Goose (*Anas semipalmata* Lath.), one-third less than the natural size.

Male.—*a.a.* Convolutions of the trachea not found in the second specimen (*tab.* 14.). *b.* Right clavicle, common form. *c.* Left clavicle, enlarged.

d. Projecting point for the attachment of the tube of the trachea.

e.e. Cavities to receive the head of each humerus. *f.f.* Aperture formed by the junction of the furcula, clavicle and scapula, through which passes the tendon of the second pectoral muscle (*levator alæ*) to be inserted on the upper part of the humerus.

Tab. XIV.

Trachea and Clavicles of the Semipalmated Goose (*Anas semipalmata* Lath.), one-third less than the natural size.

Male.—*a.a.* Part of the sternum. *b.* Left clavicle, common form.

c. Right clavicle, enlarged. *d.* Projecting point for the attachment of the tube of the trachea.

e.e. Cavities to receive the head of each humerus. *f.f.* Aperture formed by the junction of the furcula, clavicle and scapula, through which passes the tendon of the second pectoral muscle (*levator alæ*) to be inserted on the upper part of the humerus.

Tab. XV.

a. Part of the trachea of the Muscovy Duck (*Anas Moschata* Linn.).

b. Free hind-toe of the Ducks of the first division.

c.d. Lower

c. d. Lower portion of the trachea of the King Duck (*Anas spectabilis* Linn.) in two points of view, taken by permission from a specimen in the collection of Joshua Brookes, Esq., not hitherto figured.

e. Trachea of the Red-crested Duck (*Anas rufina* Pallas), not hitherto figured.

f. Lobated hind-toe of the Ducks forming the second division.

g. Ensiform process of the sternum in the Goosander (*Mergus Merganser* Linn.).

h. Trachea of the Goosander. The representations referred to by the letters *a. e.* and *h.* are one-third less than the natural size. All the rest are of the natural size.

XVI. *On two new Genera of Land Tortoises.* *By Thomas Bell, Esq., F.L.S.* *Communicated by the Zoological Club of the Linnean Society.*

Read March 6, 1827.

In a monograph of the "Freshwater Tortoises having a moveable Sternum," published in the first volume of the *Zoological Journal*, I took occasion to remark, that it is in the genus *Terrapene*, and especially in those species which had been confounded by authors under the trivial name *clausa*, that we must look for the intermediate affinities by which the Freshwater Tortoises are connected with those which inhabit the land. These relations, however, are such as to constitute them a group of the family *Emydidæ* or true Freshwater Tortoises, notwithstanding their habits and structure approach in a certain degree to those of the *Testudinidæ* or Land Tortoises: and I sought in vain amongst the known species of the latter family for the slightest approach to such a similarity of structure as should point out a relation to the former.

About two years since, however, I obtained a living specimen of a new species of Tortoise (*Kinixys castanea* of the present communication), which appeared to possess in several particulars the relations of which I was in search. In the depressed form and remarkable lateral expansion of the shell, it exhibits an evident approach to the form of the shell in the genus *Emys*, whilst the size of the openings for the passage of the feet indicate an extraordinary facility and extent of motion. I find consequently,

sequently, that in accordance with this structure, its movements are by far more active than those of any other Land Tortoise I have seen; and that although the feet retain the clavated form belonging to the *Testudinidæ*, yet this is so much modified as to show a marked approach to the flattened, palmated conformation of those of the *Emydidæ*, whilst the claws are observed to assume somewhat of the length and sharpness which characterize the Freshwater family. These evident affinities to the latter group are remarkably strengthened by a peculiarity of structure in the *dorsum* or upper bony shell, which is divided into two portions, the posterior of which is moveable, and capable of being brought into actual contact with the posterior margin of the sternum, so as completely to protect the hinder feet and tail when they are withdrawn within the shell; or, by relaxing the muscles which had thus closed the box, to allow of its being opened to the extent of from one-half to three-fourths of an inch. This singular capability of motion is produced by the absence of any bony union between the fifth and sixth ribs, which are only connected by means of an elastic ligamentous substance. I have since become possessed of several shells of this species, in all the older specimens of which, that part of the inferior margin of the upper shell which is opposed to the edge of the sternum, is actually eroded by the force with which it has been continually brought into contact with it.

Although the situation of the hinge I have described, and the part to which the office is assigned of closing the shell, are different in the two groups, there is still, in the fact of a peculiar structure being formed for this specific purpose, a relation between them, which, conjointly with the other affinities of conformation to which I have alluded, appear to me to justify the view I have taken of them, as forming the two links by which the families are connected.

Some time after I had received the living specimen of which I have spoken, my friend Mr. J. E. Gray showed me two specimens of another species, very closely allied to the former, and having exactly the same peculiarity of structure. These were presented by Sir Everard Home to the British Museum, and have received from Mr. Gray the specific name of *Homeana*. I have now in my collection a third specimen of the latter species.

To the genus thus constituted, I have applied the name Kinixys, from *κινέω moveo*, and *ἰξὺς lumbus*.

The other genus, which it is the object of this paper to describe, possesses also one peculiarity which is interesting in a similar point of view, as exhibiting a further affinity, or possibly only an analogical relation, to the Box Tortoises, although itself strictly belonging to the terrestrial family. From a careful examination of the Tortoises with a moveable sternum, and a comparison of them with every other group, I was convinced that wherever either of the transverse sutures of the bones composing the sternum is exactly adapted to the transverse division of the sternal scuta, there is no bony union of the two portions, and the moveable sternum consequently exists; and that such a structure could be thus ascertained, even in dried specimens, where the parts had become completely fixed.

This opinion I was led for a time to consider erroneous, in consequence of examining the shell of a new species of Tortoise, evidently of the terrestrial form, and belonging therefore to the *Testudinidæ*. This specimen had lost the anterior lobe of the sternum; and from the appearance of the fracture, it was obvious that the suture of the bone and the junction of the humeral and pectoral plates had existed exactly at the same line: and as no such structure as that of a moveable portion of the sternum had ever been found to belong to any Tortoise of a similar general conformation, I believed that this fact was probably fatal

to

Fig. 1.

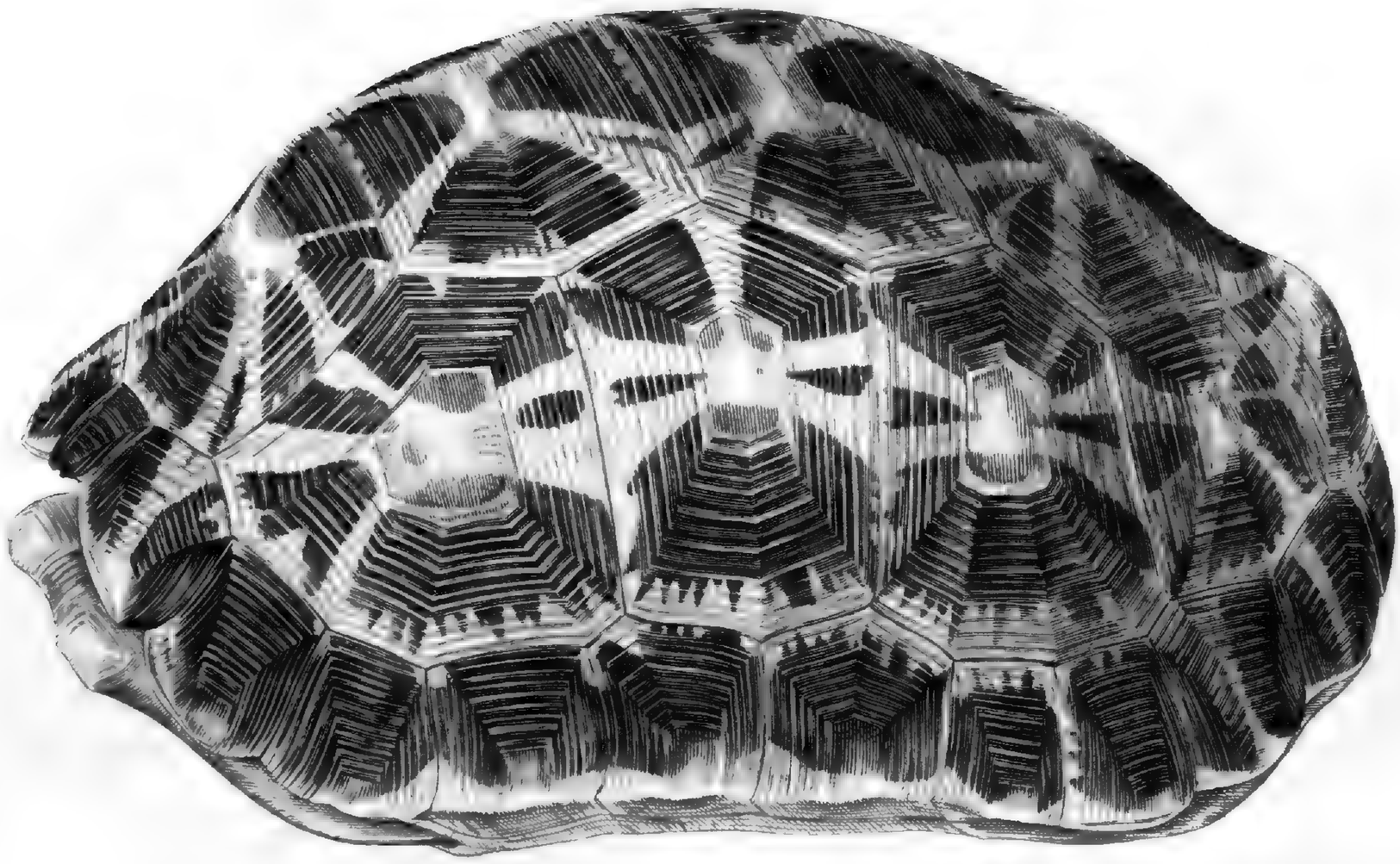
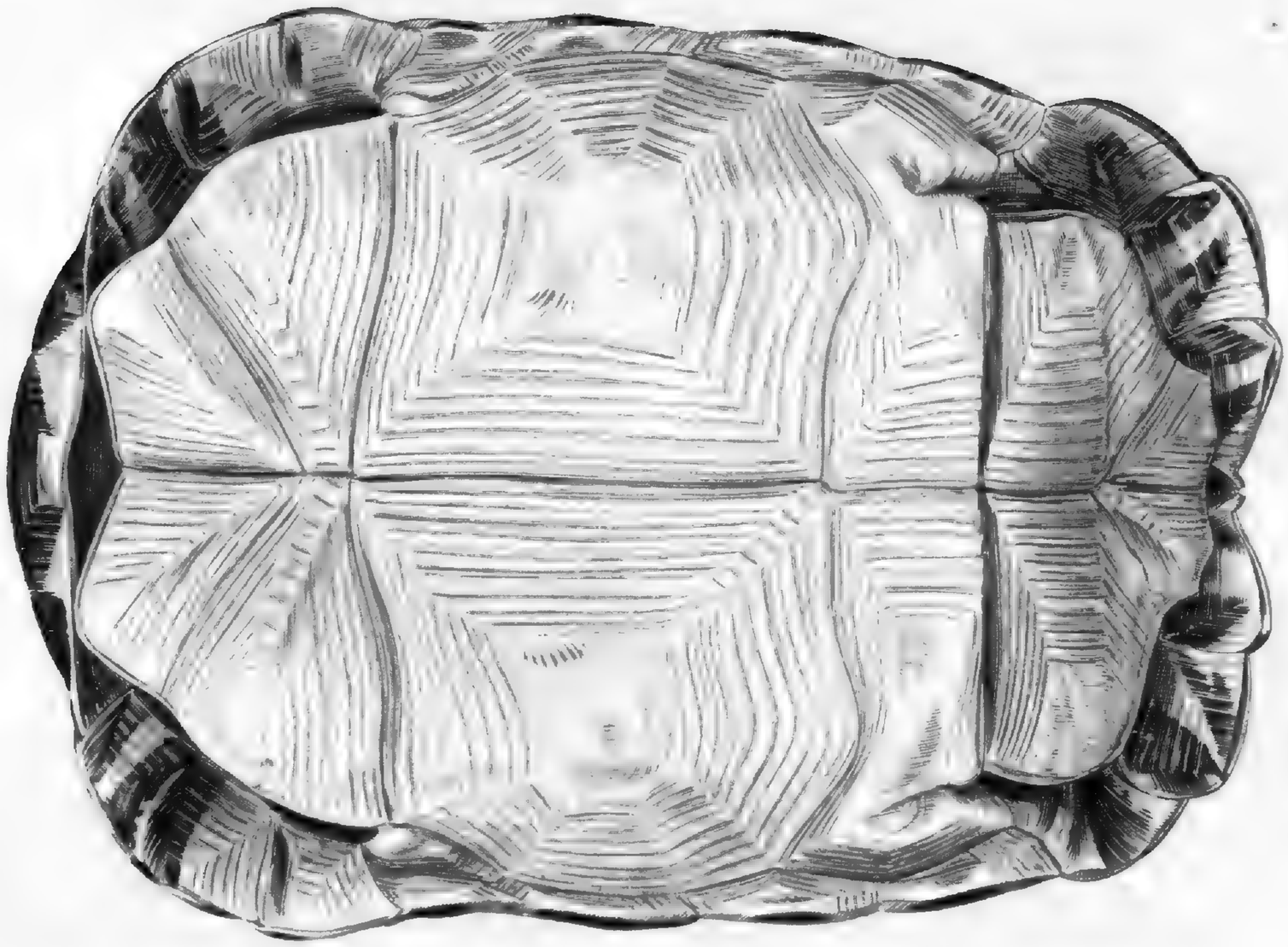


Fig. 2



Pyxis arachnoïdes

to my former theory. The possession at length of a specimen of the same species, in which the sternum was uninjured, confirmed its truth, however, by exhibiting a perfect *land* Tortoise with the anterior lobe of the sternum moveable, and capable of as accurately closing the shell, as in any species of the fresh-water Box Tortoises.

This peculiarity, so unexpected in the Land Tortoises, appears to be sufficiently important, connected as it is with a remarkable modification of the muscular system, to require a distinct generic appellation, which I propose to supply by the name Pyxis.

The importance of such species as form a passage from one group to another, and the affinities of which serve to indicate the relations whereby the different groups are connected, will perhaps be a sufficient excuse for my having dwelt so long on the minute circumstances connected with the history of those species which form the subject of this paper; especially when it is considered, that in the present instance they fill up a *hiatus* which has long interfered with a perfect knowledge of the natural arrangement of the order.

Ordo. Testudinata, *Merrem*.

Fam. Testudinidæ.

Genus. PYXIS.

Pedes clavati?
Testa gibba.
Sterni lobus anterior mobilis, ligamento articulatus.

Pyxis arachnoïdes. Tab. XVI. Fig. 1. 2.

Habitat ——?
Mus. nostr.

De-

Description. *Shell* gibbous, ovate, emarginate before, slightly expanded over the hinder feet. *Scuta* striated, black, with a few broad yellow radiations, which are narrower at the area, increasing in breadth towards the circumference; in many of them a dentated yellow margin. The first *vertebral scutum* pentagonal, broader than it is long, the lateral margins parallel, anteriorly truncate; the second, third, and fourth hexagonal; the fifth irregularly quadrilateral: the first *costal scutum* trapezoidal, very irregular; the second and third pentagonal; the fourth quadrate: *marginal scuta* 24, consisting of 11 pairs, and an anterior and posterior single one; the anterior small, linear, emarginate at the apex; the posterior very broad, quadrate, inflexed. *Sternum* of an uniform yellow colour, nearly as long as the upper shell, and very broad; the *anterior lobe*, which is covered by the *gular** and *humeral scuta*, slightly emarginate, very moveable, connected with the body of the sternum by a ligament, and capable of entirely closing the anterior opening of the shell; when closed, the margin is considerably within that of the upper shell: the abdominal portion of the *sternum* very large; the *sterno-costal suture* extending from the fourth to the seventh pairs of marginal scuta inclusive; the anterior margin of the *pectoral scuta* overlapping the posterior margin of the *humeral*, so as to conceal the joint: the posterior lobe of the *sternum* broad

* In order to avoid unnecessary repetition, and to render descriptions of these animals more intelligible by a fixed nomenclature, I have applied to the six pairs of sternal scuta the following names, expressive of their relative situation with regard to the different parts of the animal. The first pair I have termed *gular*, the second *humeral*, the third *pectoral*, the fourth *abdominal*, the fifth *femoral*, the sixth *caudal*. Of the two pairs of scuta situated at the junction of the sternum with the upper shell,—I have assigned to the anterior the name of *post-humeral*, and to the posterior that of *ante-femoral*.

and

and short; the *caudal scuta* truncate, in contact with the upper shell, excepting a slight emargination for the passage of the tail; the spaces for the hinder legs very small and contracted.

As I have only seen the shell of this species, I am unfortunately obliged to confine the description to that part.

I have in my collection two specimens of this Tortoise, which differ considerably from each other both in colour and form. In one, the ground-colour of the upper shell is deep black, the radiations of a bright clear yellow, and the sternum of a light yellow: the areæ of the dorsal scuta are quite flat, and the hinder part of the back somewhat depressed. In the other, the ground-colour is of a deep blackish-brown, the radiations very obscure, and the sternum of a brownish-yellow colour, the anterior lobe being the darkest part: the dorsal scuta are elevated in the centre, and the back is everywhere evenly rounded, forming nearly a semicircular outline. Notwithstanding these points of dissimilarity however, which give at first sight a strikingly different appearance to the two specimens, the essential characters both of marking and of structure are sufficiently preserved to identify them as individuals of the same species.

Dimensions.	Inches.	Lin.
Length of the upper shell, following the curvature	7	0
Length in a direct line	5	0
Breadth, following the curvature	6	3
Circumference	10	0
Lateral diameter	3	6
Vertical diameter	2	5
Length of the sternum	4	6
Length of the moveable lobe	1	2
Breadth of ditto at its articulation	2	0

Genus.

Genus. KINIXYS.

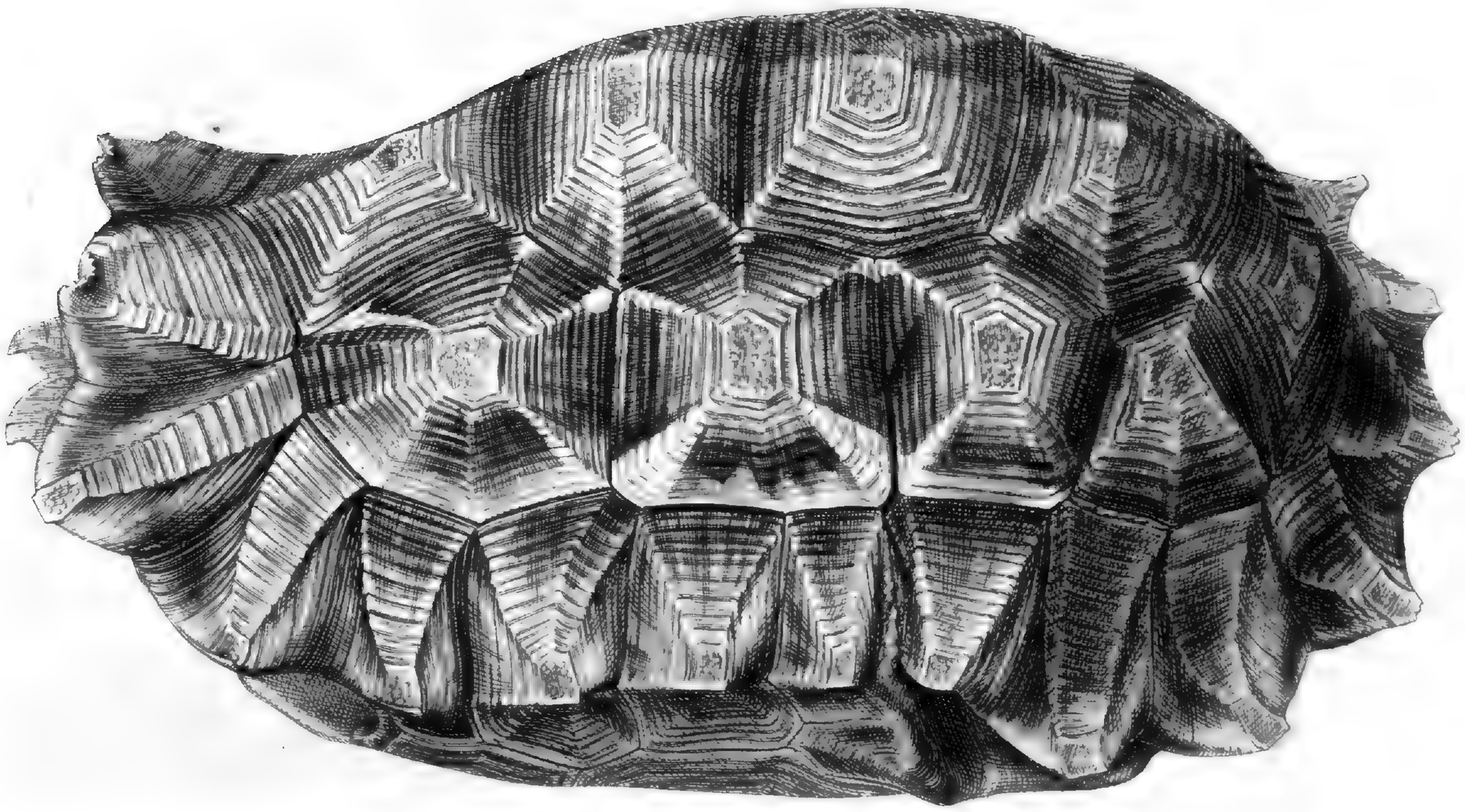
Pedes subclavati.
Testa expansa, subdepressa.
Dorsi pars posterior mobilis.

Spec. 1. KINIXYS CASTANEA. TAB. XVII. Fig. 1.

Sterno anticè ultra testam superiorem prominente; scutis marginalibus 23.
Habitat in Africâ.
Mus. nostr.

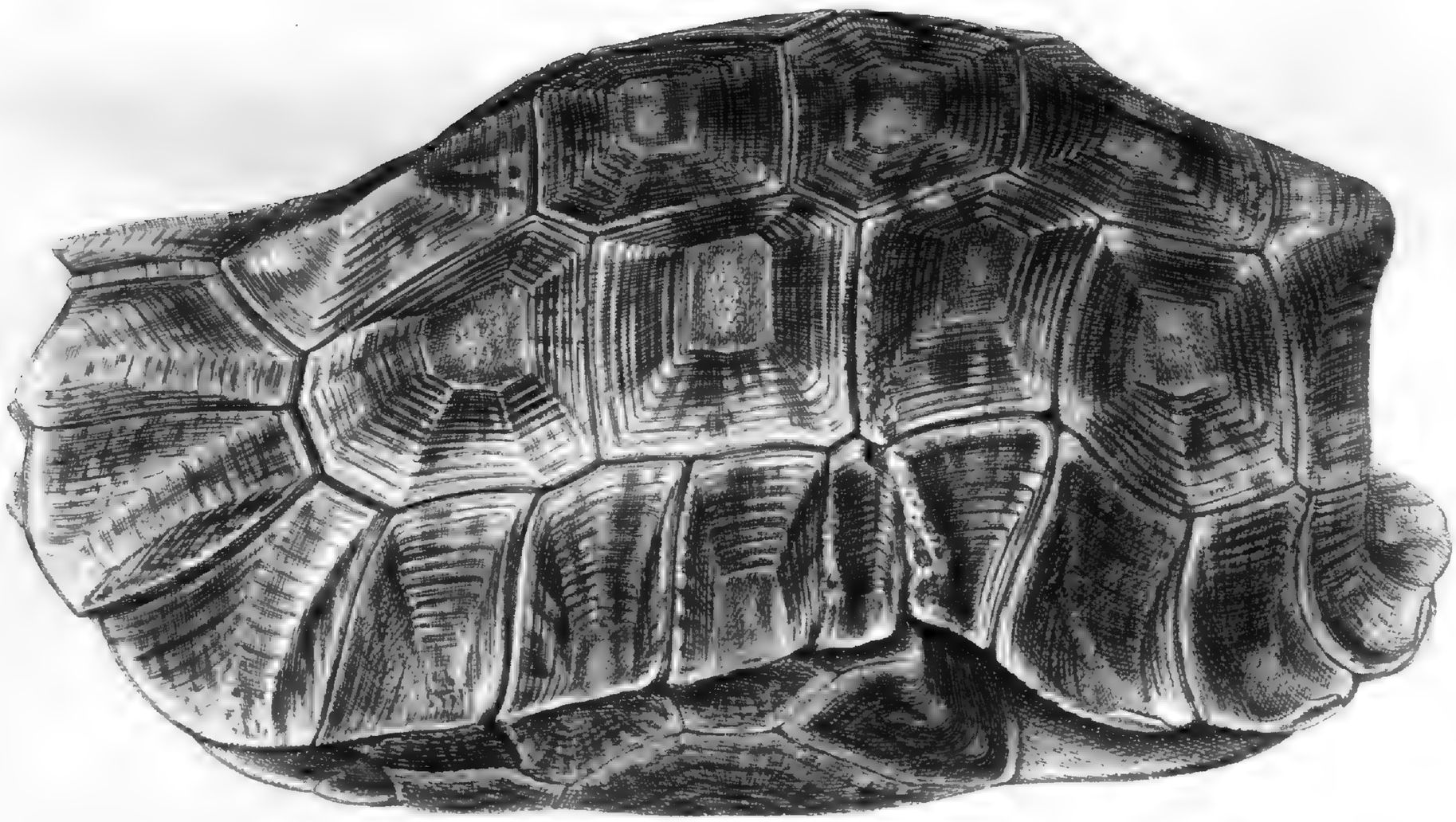
DESCRIPTION. *Head* rather long, somewhat depressed. *Feet* compressed, less clavated, and the toes more distinct than in the other species of the family. *Shell* of a rich chestnut-brown colour, the older specimens having patches of yellow principally towards the lower margin of the costal scuta; broad-ovate, rounded and gibbous posteriorly, the anterior and posterior margins projecting and somewhat reflected: the marginal outline deeply denticulated. *Dorsal scuta* strongly marked with concentric striæ, and a raised line in the direction of each angle, radiating from the area: the *vertebral scuta* slightly carinated; the first pentagonal, the anterior angle acute, the area having a sharp ridge; the second, third, and fourth hexagonal; the fifth gibbous, quadrangular, the base very broad, and forming the segment of a circle: the first *costal scutum* trapezoidal, elongated, the inferior margin rounded; the second and third pentagonal; the fourth trapezoidal. *Marginal scuta* 23; viz. 11 pairs, and a posterior single one; the anterior ones turned up at the areæ, which are marginal, and have somewhat the appearance of being eroded; the lateral and posterior hollowed; the margin raised, projecting, and with the areæ reflected. The moveable hinge or joint commences immediately

Fig. 1.



Kinixys castanea.

Fig. 2.



Kinixys Homeana

J.D.C. Sowerby, del. et sculp

immediately behind the posterior sterno-costal ridge, and is continued across the back between the fifth and sixth ribs, and between the seventh and eighth marginal, the second and third costal, and across the third vertebral scuta. *Sternum* large; the general colour blackish, each scutum having a yellow margin, especially in the older specimens; anteriorly bifid, projecting beyond the upper shell; the inferior surface very concave: *gular scuta* extending far within the shell, and affording a long and firm support to the head and neck. The anterior opening of the shell extending far back on each side. The *post-humeral plates* small. The lateral connection between the sternum and ribs extending from the fourth to the seventh pairs of marginal plates inclusive. Posterior opening of the shell very wide, particularly at the sides, for the motion of the hind legs. The *ante-femoral plates* very large. The *sternum* in contact with the inferior margin of the upper shell when the moveable portion is closed.

I regret, that in consequence of the individual which had been living in my possession having been after its death sent to be stuffed, and suffered to become putrid, the notices of the animal are necessarily so confined.

Dimensions of a remarkably large specimen.

	Ft.	In.	Lin.
Length of the upper shell following the curvature	0	11	5
Length in a direct line	0	9	0
Breadth following the curvature	0	8	3
Circumference	1	5	3
Lateral diameter	0	6	5
Vertical diameter	0	4	0
Length of the sternum	0	8	8

Spec. 2. Kinixys Homeana. Tab. XVII. Fig. 2.

Dorso posticè abruptè gibbo; scuto marginali antico impari.

Habitat in Africâ occidentali.

Mus. nostr. et Brit.

Testudo Homeana. *Gray MS. in Mus. Br.*

This species very much resembles the former in all its general characters, not only of form but of marking: the outlines, however, are more strongly marked, the general appearance ruder, and the shape more flattened and expanded. It is of a dull brown colour, with yellowish blotches along the sides, and the internal part of the marginal plates, where the head and extremities pass, of a rich deep red. The gibbous projection of the back is so considerable as to form a right angle. The second, third and fourth vertebral scuta are very irregularly hexagonal, and the second and third costal as irregularly pentagonal, the sides of each figure being extremely unequal. The anterior marginal plates project to a greater extent than in *K. castanea*, and the whole of the marginal scuta are more horizontal and more expanded. They are 24 in number, having, in addition to those of the other species, a long, linear, pointed, single one between the first pair. The joint which renders the hinder part of the back moveable is similar in its structure and situation to that of *K. castanea*, but is even more strongly marked. The anterior part of the sternum does not project, as in that species, beyond the upper shell, nor is its bifid extremity so long and pointed.

Mr. Gray informs me, that the specimens which are in the British Museum came from Sierra Leone, and were collected by Lieut. M. C. Friend, R.N. He states, that according to that gentleman's account the back part moved considerably when the animal was alive.

Dimensions.

Dimensions.	Ft.	In.	Lin.
Curvature of the upper shell longitudinally . .	0	10	0
Ditto laterally	0	5	0
Circumference	1	2	0
Length in a direct line	0	7	5
Lateral diameter	0	5	2
Vertical diameter	0	3	3
Length of the sternum	0	6	8

XVII. *Of the Insect called* Oistros *by the Ancients, and of the true Species intended by them under this Appellation: in reply to the Observations of W. S. MacLeay, Esq., and the French Naturalists. To which is added, A Description of a new Species of* Cuterebra. *By Bracy Clark, F.L.S., and Foreign Member of the Royal Academy of Sciences of Paris.*

Read November 19, 1826, *and February* 20, 1827.

In the 14th volume of the *Transactions of the Linnean Society*, is a communication written by my friend W. S. MacLeay, Esq., intended to prove that the fly, intitled *Oistros* by the ancients, was not the insect so named by Linnæus, but that it probably belonged to the present Linnean genus *Tabanus*.

Being of a contrary opinion, I am led once more to address this learned Society, to lay before them the grounds on which it is founded, that naturalists may not incautiously and too hastily adopt the above conclusion, and that they may avoid the confusion which change of names and counter changes always produce in science. I am also led to this undertaking in order to vindicate Linnæus himself, our great master, and such distinguished naturalists as Vallisneri and Reaumur, with whose views on this subject I wholly concur. Nor is the justification of myself wanting as a motive to induce me to re-examine the subject, having formerly sent to this Society a dissertation of some extent on the genus *Œstrus*, unfolding some curious discoveries

coveries in the characters and natural habits of this singular race of insects*.

Disputations about the meaning of the ancients, and identifying their descriptions with the modern species of natural history, would perhaps, in a general way, be better avoided in the valuable volumes of this Society, as leading to much desultory and unsatisfactory discussion: practical subjects and didactic facts would perhaps better maintain their reputation. As, however, the Society have in this instance already admitted the discussion, it is but fair and just to allow the reply in the same channel, that the impression, if erroneous, may be removed.

W. S. MacLeay, in the paper alluded to, insists that the οἶστρος of the ancients, and the *Brize* or *Breeze* of the old English poets, is not the *Œstrus* of the moderns; and he infers this from the anatomical characters which some of the ancient authors have left us of their insect. Now, besides the anatomical descriptions to be found in the works of philosophers, there is another mode of identifying the insect; and that is, by the description of the effects it produces upon cattle, and which are so singular, that they have afforded incidents to most rural poets, ancient and modern: and the truth seems to be, that the poets in describing these effects have been true to nature; while the philosophers, being presented with a wrong insect, have only involved the subject in error.

That it is an Italian insect we have the authority of Vallisneri of Padua, who appears to have been the first naturalist who bred the true *Œstrus Bovis* from the grubs found in the backs of the cattle; and for the first time, as far as we possess any record of the subject, saw with certainty the identical object that created so much commotion among them. He applied

* Published in the 3rd volume of the Society's *Transactions*.

correctly

correctly enough the passages of the ancients which he thought had allusion to this insect. Reaumur followed Vallisneri in these researches, and bred with great difficulty one imperfect specimen of the true *Œstrus Bovis*. Linnæus next followed; but not having ever seen the insect, and not daring to describe from figures merely, or the descriptions of others, he took the large Horse Bot for it,—the *Œstrus Equi* of my enumeration. This error is continued through all the editions of the *Systema Naturæ*, intending all the while, and referring to Vallisneri and Reaumur for, the true *Œstrus Bovis*. Thus, like some of the ancients, he also described a spotted-winged insect for the *Œstrus Bovis;* whereas the true insect has perfectly spotless wings. The true fly cannot be caught in the act of oviposition, from the violent running of the cattle, and the terror they are in at the approach of their enemy.

This makes it more than probable, nay, almost certain, that if Aristotle, Ælian or Pliny described an insect with spotted wings, or with a trunk or proboscis, &c., they knew nothing about the true *Œ. Bovis*, and had been deceived as to the real object of their research. It was indeed much more easy for them to have been presented with one of the numerous host of flies that infest the backs of cattle and lodge on them, than the true *Œ. Bovis*. Their fly may have been a *Tabanus* or an *Asilus*, a *Conops*, or a *Culex*, or any other with spotted wings; for as the true fly cannot be caught in the act of oviposition, it was next to impossible they should have discovered, or been made acquainted with, the true object of such disturbance. Indeed, during these commotions it would be dangerous to approach the cattle, or to remove any thing from their back; and if an insect was caught under any other circumstance, how could it be known that it was the genuine cause of this agitation?

It is in vain now to inquire what precise fly these ancient philosophers

losophers might have been presented with, as their testimonies are various, and militate against each other; but none are descriptive of the true fly, which we now fully know. Surely such a conclusion is more natural and just, than to suppose these conflicting descriptions true, and that the poets and common observers were false witnesses.

I now proceed to give what Virgil says respecting the name of it among the ancients, and the tumult it occasions; and of which no sweat-sucking *Tabanus*, *Conops*, or modern *Asilus*, can in any way be the cause.

> " Est lucos Silari circa, ilicibusque virentem
> Plurimus Alburnum volitans, cui nomen Asilo
> Romanum est, Œstron Graii vertêre vocantes:
> Asper, acerba sonans: quo tota exterrita sylvis
> Diffugiunt armenta, furit mugitibus Æther
> Concussus, sylvæque, et sicci ripa Tanagri."
>
> GEORG. lib. iii. v. 146.

From this admirable description, it is clearly manifest that *Asilus* was the Roman name for the fly which agitates the cattle; and it is equally clear that *Œstros* was the Greek name for it.

Not much weight is due to the observation, that Homer's insect was not the modern *Œstrus*, because he mentions the spring as the season of its appearance, since he also adds, in the same line, ὁτε τ' ἤματα μακρὰ πέλονται, "when the days are long;" nor that Shakespeare did not use the word *Brize* for the same insect, merely because he has assigned its appearance to the month of June, when it more often appears now in July. Indeed the alteration of style will account for this difference. But the same poet uses the word in another place, where the allusion is too distinct to be mistaken:

> " The herd hath more annoyance by the Brize,
> Than by the Tiger." *Troilus and Cressida.*

And

And again in an old Play, quoted by Archdeacon Nares in his Glossary, the following use of the word occurs,

"I will put the Brize in's tail, shall set him gadding presently."

Now if MacLeay or Latreille, who entertains a similar opinion, had ever been as much among cattle on the heaths, as my pursuits have led me, they would have long since obtained a practical acquaintance with the effects produced by these insects, and would not have been led to suppose that the *Tabani*, *Conopses*, or *Culices*, were the object of poetic description, or have made any mistake between the effects of one and the other. When the *Tabani* and *Conopses* have come and settled in great numbers on the back and sides of the animal, he would, as I have often witnessed, scarcely regard them. A toss of the head, perhaps, towards the part, if they sucked a little too vigorously; or, if they were still more importunate, a lash of the tail, was in general all the notice he would condescend to take of them. But if an *Œstrus* approached, the consternation was indescribable, and the agitation most remarkable; and the object attacked, however lazily he might be disposed from the heat of the weather, or a full belly, would become suddenly as agile as a young deer, and canter away, holding out his tail, and running with a sort of undulatory movement of the back (thereby endeavouring, perhaps, to disappoint the touch and designs of his enemy), till he had obtained his accustomed retreat in the water, or the fly had quitted him,—

. . . . . Tossing the foam
They scorn the keeper's voice, and scour the plain,
Through all the bright serenity of noon;
While from their labouring breasts a hollow moan
Proceeding, runs, low-bellowing, round the hills.

Thomson.

Assuredly no *Tabanus* can produce any effects like these. Unable

able to account for this extraordinary agitation, I had formerly given way to the notion of some very painful infliction by the *Œstrus*: but I am now led to question this opinion, inasmuch as I can discover no instrument by which this effect can be produced. The shrill sharp sound, which Virgil describes, was, I dare say, not stated without some real ground; and a friend of mine actually informed me, that he was standing in a farm-yard one day near some cattle, when one of these flies entered and approached them, and that he distinctly heard this shrill sound. In confirmation of this account we may remark, that the wing-scale, covering the *halteres*, which has been supposed by Keller to be the organ of sound, is particularly large in this insect; but further than this we dare not assert, but leave the point for future investigation. We know from Linnæus's own account, that the *Œstrus Tarandi*, or Rein-deer Bot, very similar in all respects to the *Œ. Bovis*, makes no sound while depositing its egg; which again brings me into doubt upon this matter.

We next have to observe, in confirmation of the peculiar effects of these insects upon the animals they infest, that those of the *Œstrus* of the Rein-deer, are equally singular and remarkable; and this fact we have from the indefatigable researches of our immortal leader, Linnæus himself. He says, speaking of the *Œ. Tarandi*, in his Lapland Tour, that as he was in bed early one morning, he perceived a very ungrateful smell, and when day-light appeared, "there were standing about the cot a thousand of these Rein-deer, driven by old men, boys, dogs, and women, who milked these animals. They appeared to be under the apprehension of some invisible attack: the animals carried their heads aloft, their ears pricked up and extended, beating the ground, and kicking in the air with their

feet, as though by enchantment. Then for a while they would be quiet; then, again, they were seen most furious, and this with so general and regular a movement, that no army would have surpassed their exercises in uniformity."

Linnæus further states, in the *Lachesis Lapponica*, respecting the effects produced by this sort of *Œstrus*, that in passing afterwards into the Lapland alps he observed a Rein-deer, which was loaded with his own package, frequently to stop short and become perfectly quiet and motionless as a pillar of stone, or one suddenly struck with catalepsy; the head held straight out, the ears upright, the eyes fixed; nor could he by any ill treatment be induced to proceed; but in a little while he would again resume his march. Where, I would ask, is the *Tabanus*, or *Conops*, that could produce effects like these? or what naturalist, at all acquainted with the operations of Nature herself, could confound the dissimilar effects produced by these several insects?

Linnæus further says, that in the Rein-deer fly he saw the egg held out "like a white mustard-seed" at the end of the abdomen, which, if true, fully confirms the supposition that there can be no infliction.

The *Œstrus hæmorrhoidalis* and *Œstrus Ovis*, in performing their office of ovi-deposit, are also equally irritating and peculiar, as I have shown in the paper above alluded to, in the 3rd volume of the Society's *Transactions*.

I avail myself of this opportunity in conclusion, to state, in addition to my former remarks on this genus, that it appears to me, as there is no *aculeus* or weapon of infliction at the end of the abdomen of the female of the *Œstrus Bovis*, that the egg is simply thrust down among the hair, till it meets the skin, and that then it is affixed to it by a glutinous liquor secreted at the

same

same time; and that the egg being hatched, the young grub insinuates itself into, and finally through the skin, forming an abscess beneath it. In a somewhat similar manner it is that the ichneumon flies deposit their eggs on the sides of living caterpillars of the *Lepidoptera*, and hatching, perforate their skins, and entering within, live on the parenchyma or pulp of their bodies till matured and fully grown, when they make their way out again and change to the chrysalis.

I may also remark of the *Œstri*, that they appear to be wonderfully kept from such an increase as would be fatal to the animals they feed upon, by the difficulties and imminent hazards they are exposed to in the act of depositing their eggs. The teeth of the horse must destroy, one should imagine, nine-tenths of the *Œ. Equi*, *hæmorrhoidalis*, and *salutiferus*. The *Œstri* seem however, in the hands of Providence, to make a double recompense for the sufferings they occasion; first, by keeping the animals on the alert during hot weather, when they would be often too idly disposed for their welfare; while the few larvæ which succeed in getting into their bodies, appear to benefit them by their local irritations, stimulating the stomach to a quicker digestion of their watery food, and diverting diseases by their counter irritations of the skin and frontal cavities,—thus producing the effect of issues or vesicatories, which are powerful remedies in relieving and in preventing diseases.

I apprehend that I have now sufficiently shown that the *Œstrus* of the ancients could have been no *Tabanus*, and that it is clear Olivier, who appears to have originated this notion, and who was followed by Latreille, was mistaken.

A very extensive enumeration of this genus is seen in a late ingenious publication, the *Systematische Beschreibung* of J. W. Meigen. It is however in some instances not correct; for on carefully examining the *Œstrus lineatus* of this writer, intro-

duced from Villers, it would appear to be that stumbling-block of systematists in entomology, the *Œ. Bovis* of my enumeration *, and not of Linnæus, as he states, who, as we have repeatedly said, described the *Œ. Equi* for this species. The *Œ. pictus* of this author, beautifully figured by Curtis in the *British Entomology*, *no.* xxvi. *t.* 106, I rather suspect to be the faucial bot of the Stag †.

As the species of the new genus *Cuterebra* were taken for *Œstri* till I separated them, and are closely allied to them in their habits, I have ventured at the close of this paper to communicate to the Society a new and undescribed species lately received from America, along with some other insects sent me by my nephew, Joseph Clark, from the Illinois.

Cuterebra fontinella.

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

White-tailed Cuterebra, or Blue Rabbit Fly.

Habitat in Illinoe Americæ Septentrionalis, cuniculos infestans.

Descr. *Cuterebrâ Cuniculi* dimidio minor; atra, subcylindrica, cum capite parùm latior. *Frons* insuper atra et circa oculos lucida, infra albida, pilosa, utrinque puncto elevato atro. *Oculi* picei. *Thorax* insuper ater, latè per

* The lines on the thorax, and the figure of Villers, undoubtedly confirm it. Meigen's *Œ. Bovis* is the *Œ. Bovis* of my enumeration, under which this should have come as a synonym.

† I may here observe, that a few days since, in visiting the British Museum, I was shown the insect Dr. Leach has called *Œstrus Clarkii*, and find it only a variety, and scarcely that, of the *Œstrus veterinus* of my enumeration.

medium et ad latera pilosus, albus, punctis tribus nigris utrinque notatus. *Alæ* obscurè nigro-fuscæ, sulcis valdè puculatæ et rugosæ, corpore longiores ; ad basin squamulâ foliaceâ erectâ, magnâ : tympanum halterem tegens magnum, convexum, marginatum. *Abdomen* breve, atrum, lucidum, supernè violaceo resplendens ; segmentis duobus postremis hirtis, albidis, punctisque variis atris elevatis, glabris. *Anus* utrinque quasi forcipe prehensorio armatus. *Pedes* atri.

XVIII. *A Review of the Genus Combretum.* *By Mr. George Don, A.L.S.*

Read March 21, 1826.

The rapid increase of new species has rendered monographs absolutely necessary, as the only sure means of determining the peculiar characters of each. Perhaps no genus affords a more striking example of this rapid increase than the genus *Combretum*. The latest general work, namely, Sprengel's *Systema Vegetabilium*, contains only six, while in the following monograph the number amounts to forty-one, exclusive of four doubtful ones, recorded in the *Hortus Bengalensis*, some of which are most probably identical with some of those here described.

As few plants surpass *Combreta* in the brilliancy and elegance of their blossoms, so their species have become great favourites with collectors. The *Combretum purpureum* has long been one of the greatest ornaments of our stoves; but some of the species lately introduced are likely to outvie it in beauty. The species of the genus, and indeed of the whole order, with the exception, perhaps, of *Combretum nanum* from Nepal, are exclusively confined to tropical countries; but the largest proportion is peculiar to Africa.

In order to facilitate a knowledge of the species, I have divided the genus into divisions and sections, which will be found separately characterized in their respective places.

COMBRETUM.

COMBRETUM. *Lœfl., Linn., Juss.*

Syst. Linn. Octo-Decandria Monogynia.

Ord. Nat. Combretaceæ. *Brown.*

Char. Essent. *Calyx:* Limbo 4—5-dentato, deciduo. *Petala* 4—5 summo calycis inserta. *Fructus* 4—5-alatus.

Char. Gen. *Calyx* superus, tubulosus, vel turbinato-campanulatus, intùs villosus: *limbo* 4—5-dentato, deciduo: *dentibus* æqualibus, erectis. *Petala* 4 vel 5, limbo calycis inter lobos ejusdem inserta, æqualia. *Stamina* 8 vel 10, limbo calycino duplici vel rarissimè simplici serie inserta, exserta, quorum 4 aut 5 petalis opposita et breviora. *Antheræ* biloculares, dorso affixæ, longitudinaliter dehiscentes. *Ovarium* uniloculare, 4—5-angulatum. *Ovula* plura (2—5), pendula. *Stylus* exsertus. *Stigma* acutum. *Fructus* 4—5-alatus, unilocularis, abortu monospermus. *Semen* 4—5-gonum, apice attenuatum. *Testa* simplex, membranacea. *Albumen* nullum.

Frutices *aut* arbores, *v. rarissimè* herbæ. Caules *sæpè scandentes.* Folia *opposita, terna, aut quaterna, nunc rariùs sparsa, simplicia, integerrima.* Stipulæ *nullæ.* Spicæ *solitariæ vel geminæ, simplices, axillares et terminales, oppositæ, ternæ s. quaternæ, sæpè in paniculis terminalibus digestæ.* Flores *bracteati, sessiles, v. rariùs pedicellati, coccinei, albi, v. rariùs aurantiaci:* bracteis *sæpè deciduis.*

Conspectus Specierum.

Divisio I. *Calyx* 4-dentatus. *Corolla* 4-petala. *Stamina* 8. *Fructus* 4-alatus.

Sectio a. Calyx *campanulatus.* Spicæ *axillares et terminales.* Flores *secundi.*

1. *C. se-*

1. *C. secundum*, scandens, glabrum; ramulis subquadrangularibus, foliis ovato-lanceolatis, calycibus ovariisque resinoso-punctatis, petalis squamiformibus ellipticis mucronatis cucullatis, staminibus longissimis.
2. *C. oxypetalum*, scandens, glabrum; ramis subquadrangularibus, foliis oblongis membranaceis utrinque attenuatis subtùs calycibusque resinoso-punctatis, petalis squamiformibus obovato-lanceolatis acuminatis, staminibus longissimis.
3. *C. formosum*, scandens; foliis oblongo-ellipticis acuminatis subtùs resinoso-punctatis; junioribus calycibusque rufo-lanatis, floribus confertis, petalis squamiformibus cuneato-lanceolatis acuminatis.
4. *C. grandiflorum*, subscandens, hirsutum; foliis cordato-ellipticis cum rachi calycibusque villosis, petalis dilatatis spathulatis obtusis.
5. *C. macrocarpum*, fructu maximo, alis apice profundè cordatis.

Sectio b. Calyx *tubulosus.* Flores *fasciculato-umbellati, terminales.*

6. *C. leucophyllum*, erectum, fusco-villosum; foliis oblongis mucronatis; floralibus bracteisque linearibus mucronatis niveis, petalis lanceolatis obtusis calyce 4-plò longioribus.
7. *C. lanuginosum*, erectum? foliis orbiculatis emarginatis, floribus fasciculatis, petalis ovalibus crenulatis calyce paulò longioribus.

Sectio c. Calyx *tubulosus.* Spicæ *axillares, nec terminales.*

8. *C. extensum*, scandens, glabrum; foliis oblongis obovatisve coriaceis, spicis gracilibus brevibus solitariis confertifloris, petalis ovatis acutis calyce brevioribus.

9. *C. her-*

9. *C. herbaceum*, humile, simplex; foliis alternis lanceolatis mucronatis subtùs sericeo-villosis suprà demùm glabris, spicis geminis sparsifloris, petalis ovatis acutis calyce paulò longioribus, staminibus minùs exsertis.

Sectio d. Calyx *turbinato-campanulatus.* Racemi *axillares et terminales, paniculati.*

10. *C. paniculatum*, scandens; foliis oblongis obtusis lævibus, paniculâ terminali ramosissimâ hirsutâ, calycibus pubescentibus, bracteis brevissimis, floribus pedicellatis.
11. *C. aculeatum*, spinosum; foliis suboppositis ovatis pubescentibus, floribus pedicellatis.
12. *C. spinosum*, erectum, glabrum; ramis spinescentibus, foliis longè petiolatis ovalibus membranaceis, floribus pedicellatis, dentibus calycinis ferè obsoletis, petalis ovatis obtusis, staminibus minùs exsertis.
13. *C. Smeathmani*, scandens, hirsutum; foliis ellipticis acuminatis; floralibus flavicantibus, bracteis amplissimis, racemis elongatis, floribus pedicellatis.

Sectio e. Calyx *turbinato-campanulatus.* Spicæ *axillares et terminales, sæpè paniculæ modo dispositæ.*

14. *C. farinosum*, scandens, glabrum; foliis elliptico-oblongis obtusis subcoriaceis basi rotundatis subtùs farinosis, spicis geminis multifloris, petalis squamiformibus, staminibus longissimis.
15. *C. frangulifolium*, scandens, glabrum; foliis ellipticis utrinque lepidotis, spicis solitariis rariùsve geminis, bracteis oblongis acutis villosis, petalis crenatis subflabellatis.
16. *C. laxum*, scandens, glabrum; foliis ovatis, spicis erectis laxifloris, calycibus pubescentibus, petalis subrotundis calyce brevioribus.

17. *C. mexicanum*, humile, glabrum; ramulis novellis compressiusculis, foliis ellipticis membranaceis basi subcordatis, paniculâ polystachyâ, spicis brevibus multifloris ferrugineo-tomentosis, petalis subreniformibus calyce breviores.
18. *C. pulchellum*, scandens, puberulum; foliis elliptico-oblongis subtùs fuscescentibus, paniculâ polystachyâ, calycibus pedunculisque fusco-villosis, petalis subreniformibus reflexis.
19. *C. racemosum*, scandens, glabrum; foliis ovato-oblongis acutis nitidis, paniculâ polystachyâ, spicis elongatis apice comosis, petalis lanceolatis obtusis.
20. *C. albidum*, scandens, glabrum; foliis longè petiolatis oblongis obtusis aut suborbiculatis suprà punctatis viridibus subtùs albidis, paniculâ polystachyâ, spicis confertifloris, calycibus pubescentibus, petalis parvis.
21. *C. nanum*, erectum, humile; foliis oblongis ovatisve obtusis glabris, spicis simplicibus v. nunc basi ramosis, calycibus pubescentibus, petalis ovatis obtusis.
22. *C. Roxburghii*, scandens, glabrum; foliis ovatis obtusis, paniculâ polystachyâ, spicis sparsifloris, calycibus pubescentibus.
23. *C. odoratum*, scandens; ramulis puberulis, foliis oblongis v. obovato-oblongis apice rotundatis subemarginatis coriaceis glabris, paniculâ polystachyâ, spicis confertifloris, petalis reniformibus.

Sectio f. Calyx *turbinato-campanulatus.* Spicæ *axillares, nec terminales.*

24. *C. tomentosum*, scandens, fusco-tomentosum; foliis ovalibus mucronatis; adultis suprà nudiusculis, spicis sparsifloris, petalis ovalibus obtusis calyce paulò brevioribus, staminibus abbreviatis.

25. *C. mi-*

25. *C. micranthum*, erectum; ramulis pubescentibus, foliis oblongis obtusè mucronatis; adultis glabris, spicis tenuibus, petalis lineari-cuneatis dentibus calycinis 4-plò longioribus, staminibus minùs exsertis.
26. *C. molle*, scandens? villosum; foliis oblongo-lanceolatis acuminatis basi cordatis, spicis elongatis, dentibus calycinis brevissimis, petalis exiguis obovatis? staminibus paulò exsertis.
27. *C. latifolium*, scandens, glabrum; foliis amplis coriaceis oblongis acuminatis interdùm rotundatis, spicis brevibus confertifloris, calycibus pubescentibus, petalis obovato-oblongis obtusis, staminibus paulò exsertis.
28. *C. chinense*, scandens, ferrugineo-lepidotum; foliis ellipticis utrinque acutis suprà viridibus, spicis laxifloris, petalis exiguis, staminibus paulò exsertis.

Divisio II. *Calyx* 5-dentatus. *Corolla* 5-petala. *Stamina* 10. *Fructus* 5-alatus.

Sectio a. Calyx *tubulosus.* Spicæ *axillares et terminales, sæpè paniculæ modo dispositæ.*

29. *C. comosum*, scandens; ramulis pubescentibus, foliis ellipticis acutis basi subcordatis; adultis glabris, spicis apice comosis, bracteis lanceolatis acutis, petalis ligulatis obtusis.
30. *C. intermedium*, scandens; ramulis pubescentibus, foliis elliptico-obovatis mucronatis; adultis glabris, spicis apice comosis, bracteis ovatis mucronatis, petalis ligulatis obtusis.
31. *C. pilosum*, scandens; foliis oblongo-lanceolatis acuminatis basi auriculatis, spicis brevibus, calycibus pedunculisque fusco-pilosissimis, petalis obovato-oblongis ciliatis.

 32. *C. ovale*,

32. *C. ovale*, erectum; foliis ovali-oblongis obtusis subtùs albidis; adultis glabris; novellis cum ramulis calycibusque pubescentibus, spicis laxifloris brevibus, petalis obovato-oblongis obtusis.
33. *C. alternifolium*, scandens, glabrum; ramis spinescentibus, spinis recurvis, foliis alternis oblongis glabris suprà nitidis, spicis brevibus confertifloris, petalis lanceolatis obtusis calyce duplò longioribus.
34. *C. Pavonii*, scandens; ramulis pilosis, foliis oblongis v. ovatis acuminatis mucronatis basi subcordatis subtùs ferrugineo-villosis, spicis elongatis sparsifloris, petalis lanceolatis.

Sectio b. Calyx *tubulosus*. Panicula *polystachya, spicis secundifloris*.

35. *C. purpureum*, scandens, glabrum; foliis lanceolatis acutis atro-viridibus nitidis, spicis laxifloris, petalis elliptico-oblongis obtusiusculis.
36. *C. Afzelii*, scandens; foliis oblongis; adultis glabriusculis, spicis axillaribus terminalibusque, calycibus pubescentibus, petalis obovato-oblongis obtusis.

Sectio c. Calyx *turbinato-campanulatus*. Spicæ *numerosæ, terminales, paniculæ modo dispositæ*.

37. *C. decandrum*, scandens, fusco-pubescens; foliis oblongis acuminatis; floralibus flavicantibus, spicis numerosis confertifloris, petalis ovatis mucronatis, staminibus minùs exsertis.
38. *C. puberum*, scandens, glabrum; foliis oblongis coriaceis basi subcordatis suprà nitidis, spicis numerosis confertifloris, rachi calycibusque ferrugineis, staminibus brevibus.

39. *C. squa-*

39. *C. squamosum*, scandens, lepidotum ; foliis ovatis acuminatis coriaceis subtùs calycibusque ferrugineis, spicis laxifloris, petalis exiguis, staminibus brevibus.
40. *C. trifoliatum*, scandens ; foliis ternis oblongis acutis, spicis laxifloris, floribus secundis, rachi calycibusque pubescentibus, petalis exiguis calyci subæqualibus.

Sectio d. Calyx *turbinato-campanulatus.* Spicæ *axillares, nec terminales.*

41. *C. sericeum*, suffruticosum, erectum ; foliis suboppositis lanceolatis obtusiusculis subtùs sericeo-villosis, spicis confertifloris, rachi cum ovariis calycibusque villoso-tomentosis, petalis calyci subæqualibus, staminibus paulò exsertis.

* Species sequentes non sufficienter notæ, sed evidenter distinctæ.

42. *C. obtusifolium*, foliis obovatis obtusis glabris, floribus paniculatis.
43. *C. rotundifolium*, foliis subsessilibus rotundatis mucronatis.
44. *C. ferrugineum*, foliis brevè petiolatis lanceolatis acuminatis glabris basi attenuatis subtùs ferrugineis, spicis axillaribus terminalibusque.
45. *C. cordatum*, foliis breviter petiolatis amplis subrotundo-cordatis ; novellis pubescentibus, paniculâ spicatâ terminali.

DESCRIPTIONES SPECIERUM.

Divisio Prima.

Sectio a.

1. *C. secundum*, scandens, glabrum ; ramulis subquadrangularibus, foliis ovato-lanceolatis, calycibus ovariisque resinoso-punctatis, petalis squamiformibus ellipticis mucronatis cucullatis, staminibus longissimis.

C. secundum.

C. secundum. *Jacq. Amer. p.* 103. *t.* 176. *f.* 30. *edit. Pict. p.* 53. *t.* 260. *f.* 26. *Linn. Sp. Pl. ed.* 3. *p.* 496. *Lam. Illust. t.* 282. *f.* 1. *Willd. Sp. Pl.* ii. *p.* 319. *Pers. Synops.* i. *p.* 411. *Spreng. Syst.* ii. *p.* 331.

C. elegans. *Kunth Nov. Gen. et Sp. Pl.* vi. *p.* 109. *Syn.* iii. *p.* 398.

C. laxum. *Aubl. Gui.* i. *p.* 251. *t.* 137.

Habitat in Guianâ (*Aublet et Martin*), in Insulâ Trinitatis. *Lochead, Lockhart.* ♄. (v. s. in Herb. Banks. et Lamb.)

Frutex scandens, glaber: *ramulis* subquadrangularibus, fuscescentibus. *Folia* opposita, breviter petiolata, ovato-lanceolata, aut elliptica, acumine brevi obtuso, glabra, subtùs resinoso-punctata, suprà viridia, 4 vel 5 uncias longa, 2 ad $2\frac{1}{2}$ uncias lata. *Petioli* semiteretes, ferrugineo-lepidoti. *Spicæ* axillares et terminales, confertifloræ, solitariæ, 3—4-unciales. *Flores* magni, secundi. *Ovarium* quadrangulare, ferrugineo-lepidotum. *Calyx* campanulatus, externè ferrugineo-lepidotus. *Petala* parva, rotundato-oblonga, mucronata, cucullata, squamiformia, lutea, dentibus calycis paulò breviora. *Stamina* 8, coccinea, ferè uncialia, simplici serie inserta. *Antheræ* oblongæ, bilobæ. *Stylus* longitudine staminum. *Fructus* magni, 4-alati, brevissimè pedicellati

2. *C. oxypetalum*, scandens, glabrum; ramis subquadrangularibus, foliis oblongis membranaceis utrinque attenuatis subtùs calycibusque resinoso-punctatis, petalis squamiformibus obovato-lanceolatis acuminatis, staminibus longissimis.

Habitat in Guayaquil. *Pavon.* ♄. (v. s. in Herb. Lamb.)

Præcedenti simillimum, sed foliis utrinque attenuatis membranaceis et petalis obovato-lanceolatis acuminatis discrepat.

3. *C. formosum*, scandens; foliis oblongo-ellipticis acuminatis subtùs

subtùs resinoso-punctatis ; junioribus calycibusque rufo-lanatis, floribus confertis, petalis squamiformibus cuneato-lanceolatis acuminatis.

Habitat in Brasiliâ prope Rio Janeiro. ♄. (v. s. in Herb. Lamb.)

Præcedentibus simillimum, sed foliis junioribus calycibusque rufo-lanatis differt.

4. *C. grandiflorum*, subscandens, hirsutum ; foliis cordato-ellipticis cum rachi calycibusque villosis, petalis dilatatis spathulatis obtusis.

   Habitat in Africâ æquinoctiali prope Sierra Leona. *Smeathman*, *Afzelius*. ♄. (v. s. in Herb. Banks. et Lamb.)

Frutex subscandens, hirsutus. *Folia* opposita, breviter petiolata, cordato-elliptica, aut oblonga, acumine obtuso, pubescentia, 4 uncias longa, 2 uncias lata. *Spicæ* terminales et axillares, secundæ, 2 vel 3 uncias longæ. *Flores* magni, coccinei, secundi. *Calyx* campanulatus, 4-dentatus rachique villosus. *Corolla* 4-petala : *petalis* amplis, spathulatis, calyce plurimùm longioribus. *Stamina* 8, coccinea, longè exserta. *Antheræ* oblongæ, bilobæ. *Stylus* longitudine staminum. *Fructus* magni, 4-alati.

5. *C. macrocarpum*, fructu maximo 4-alato, alis apice profundè cordatis.

   C. macrocarpum. *Beauv. Fl. d'Oware et de Benin*, ii. *p.* 90 *t.* 118. *f.* 2.

   Habitat in Africâ æquinoctiali ad Benin. *Beauvois*. ♄.

Sectio b.

6. *C. leucophyllum*, erectum, fusco-villosum ; foliis oblongis mucronatis ; floralibus bracteisque linearibus mucronatis niveis, petalis lanceolatis obtusis calyce 4-plò longioribus.

   Habitat

Habitat in Africâ æquinoctiali prope Sierra Leona. *Smeathman*, *Afzelius*. ♄. (v. s. in Herb. Banks. et Lamb.)

Frutex erectus, ramosus, orgyalis. *Rami* villis fuscis vestiti. *Folia* opposita, oblonga, obtusa, mucronata, villosa; *floralia* nivea. *Petioli* villosi. *Spicæ* fasciculato-umbellatæ. *Flores* mediocres, coccinei, brevissimè pedicellati. *Calyx* tubulosus, villosus, 4-dentatus: *dentibus* ovatis, mucronatis. *Corolla* 4-petala: *petalis* lanceolatis, obtusis, dentibus calycinis 4-plò longioribus. *Stamina* 8, petalis multò longiora, coccinea. *Antheræ* nigræ, bilobæ. *Capsula* 4-alata, breviter pedicellata.

7. *C. lanuginosum*, erectum? foliis orbiculatis emarginatis, floribus fasciculatis, petalis ovalibus crenulatis calyce paulò longioribus.

Habitat in Abyssiniâ. *Salt*. ♄. (v. s. in Herb. Lamb.)

Frutex erectus? ramosus, lanuginosus. *Folia* opposita, brevè petiolata, orbiculata, emarginata, ferrugineo-tomentosa. *Panicula* brachiata. *Flores* mediocres, forsan coccinei, fasciculatìm congesti. *Calyx* tubulosus, extùs fusco-lanuginosus, 4-dentatus: *dentibus* mucronatis. *Corolla* semi-aperta, 4-petala: *petalis* ovalibus, crenulatis, dentibus calycis ovato-mucronatis paulò longioribus. *Stamina* 8, longè exserta. *Stylus* staminibus æqualis. *Capsula* 4-alata, breviter pedicellata.

Sectio c.

8. *C. extensum*, scandens, glabrum; foliis oblongis obovatisve coriaceis, spicis gracilibus brevibus solitariis confertifloris, petalis ovatis acutis calyce brevioribus.

C. extensum. *Roxb. Hort. Beng. p.* 28.

Habitat in insulis Moluccanis. ♄. (v. s. in Herb. Lamb. et Soc. Linn.)

Frutex amplus, scandens, glaber, diffusè ramosus, cortice cinereo longi-

longitudinaliter rumpente vestitus. *Folia* opposita, oblonga, aut obovata, lævia, coriacea, cum acumine obtuso, 5 uncias longa, $2\frac{1}{2}$ aut 3 uncias lata. *Petioli* ferè unciales. *Spicæ* breves, axillares, confertifloræ, ferè triunciales. *Flores* parvi, albi. *Calyx* lævis, tubulosus, apice dilatatus, 4-dentatus : *dentibus* ovatis, acutis. *Corolla* 4-petala : *petalis* ovatis, dentibus calycis ovatis acutis multò brevioribus. *Stamina* 8, alba, simplici serie inserta, longè exserta. *Antheræ* bilobæ. *Stylus* staminibus longior. *Stigma* subcapitatum. *Capsula* 4-alata, breviter pedicellata.

9. *C. herbaceum*, humile, simplex; foliis alternis lanceolatis mucronatis subtùs sericeo-villosis suprà demùm glabris, spicis geminis paucifloris, petalis ovatis acutis calyce paulò longioribus, staminibus minùs exsertis.

Habitat in Africâ æquinoctiali prope Sierra Leona. *Smeathman*, *Afzelius*. ♃. (v. s. in Herb. Banks. et Lamb.)

Caulis herbaceus, simplex, erectus, pedalis, pubescens. *Folia* alterna, breviter petiolata, lanceolata, mucronata, triuncialia, vix unciam lata, subtùs sericeo-villosa; adulta suprà glabra, viridia. *Petioli* villosi. *Spicæ* axillares, geminæ, v. rarissimè solitariæ, pauciflorae. *Flores* parvi, albi. *Calyx* tubulosus, extùs cum rachi sericeo-tomentosus, 4-dentatus : *dentibus* mucronatis. *Petala* 4, ovata, acuta, dentibus calycis paulò longiora. *Stamina* 8, minùs exserta. *Capsula* 4-alata, breviter pedicellata.

Sectio d.

10. *C. paniculatum*, scandens; foliis oblongis obtusis lævibus, paniculâ terminali ramosissimâ hirsutâ, calycibus pubescentibus, bracteis brevissimis, floribus pedicellatis.

C. paniculatum. *Vent. Choix des Plantes, p.* 58.
Habitat in Africâ æquinoctiali prope Senegal. *Rousillon.* ♄.

Folia subopposita lævia. *Flores* pedicellati, paniculati, coccinei, magnitudine *Combreti purpurei*, in paniculâ vastâ dispositi.

11. *C. aculeatum*, spinosum ; foliis suboppositis ovatis pubescentibus, floribus pedicellatis.
C. aculeatum. *Vent. Choix des Plantes, p.* 58.
Habitat in Africa æquinoctiali prope Senegal. *Rousillon.* ♄.

Frutex forsan erectus. *Folia* parva, brevè petiolata.

12. *C. spinosum*, erectum, glabrum ; ramis spinescentibus, foliis longè petiolatis ovalibus membranaceis, floribus pedicellatis, dentibus calycinis ferè obsoletis, petalis ovatis obtusis, staminibus minùs exsertis.
Habitat in Africâ æquinoctiali prope Sierra Leona. *Smeathman, Afzelius.* ♄. (v. s. in Herb. Banks. et Lamb.)

Frutex erectus, ramosus, 10-pedalis. *Folia* opposita, longè petiolata, ovalia, obtusè mucronata, lævia, membranacea. *Racemi* axillares et terminales, paniculati. *Flores* parvi, coccinei, pedicellati, in fasciculis collecti. *Bracteæ* oblongæ. *Calyx* turbinato-campanulatus, lævis, 4-dentatus : *dentibus* minimis, ferè obsoletis. *Corolla* 4-petala : *petalis* ovatis, obtusis, calyce paulò longioribus. *Stamina* 8, coccinea, minùs exserta. *Antheræ* bilobæ, ferè nigræ. *Capsula* 4-alata, pedicellata.

13. *C. Smeathmani*, scandens, hirsutum ; foliis ellipticis acuminatis ;

natis; floralibus flavicantibus, bracteis amplissimis, racemis elongatis, floribus pedicellatis.

Habitat in Africâ æquinoctiali prope Sierra Leona. *Smeathman*, *Afzelius*. ♄. (v. s. in Herb. Banks. et Lamb.)

Frutex scandens, hirsutus. *Folia* opposita, oblongo-lanceolata, acuminata; *floralia*, ut et bracteæ ovatæ amplissimæ, flavicantia, hirsuta. *Racemi* elongati, fusco-villosi. *Flores* pedicellati, in axillis bractearum, solitarii. *Calyx* turbinato-campanulatus, hirsutus, 4-dentatus. *Corolla* 4-petala. *Stamina* 8, exserta. *Capsula* 4-alata, pedicellata.

Sectio e.

14. *C. farinosum*, scandens, glabrum; foliis elliptico-oblongis obtusis subcoriaceis basi rotundatis subtùs farinosis, spicis sæpè geminis multifloris, petalis squamiformibus, staminibus longissimis.

C. farinosum. *Kunth Nov. Gen. et Sp. Pl.* vi. *p.* 110. *Syn.* ii. *p.* 398.

Habitat in Mexico inter Acapulca et Venta del Exido. (*Humb. et Bonpl.*) ♄.

Frutex scandens, glaber: *ramulis* albido-cinerescentibus. *Folia* opposita, petiolata, ovato-oblonga, obtusa, basi rotundata, subcoriacea, glabra, subtùs farinoso-lepidota, $2\frac{1}{2}$ pollices longa, 1 ad $1\frac{1}{2}$ unciam lata. *Spicæ* terminales, rariùs axillares, sæpiùs geminæ, 3- vel 4-unciales, multifloræ. *Flores* brevissimè pedicellati, sparsi, subsecundi, aurantiaci. *Calyx* turbinato-campanulatus, coloratus cum rachi glaber et lepidotus, 4-dentatus: *dentibus* ovatis, acutis. *Corolla* 4-petala: *petalis* parvis, squamiformibus, oblongis, acutiusculis, dentibus calycis dimidio brevioribus. *Stamina* 8, longissimè exserta. *Antheræ* bilobæ. *Stylus* stamina paulò superans. *Capsula* 4-alata, breviter pedicellata.

15. *C. frangulifolium*, scandens, glabrum; foliis ellipticis utrinque lepidotis, spicis solitariis rariùsve geminis, bracteis oblongis acutis villosis, petalis crenatis subflabellatis.

C. frangulifolium. *Kunth Nov. Gen. et Sp. Pl.* vi. *p.* 109. *t.* 538. *Syn.* iii. *p.* 398.

Habitat ad ripam fluminis Orinoco prope Angustura et Corichana. (*Humb. et Bonpl.*) ♄.

Frutex amplus, scandens, glaber: *ramulis* lepidotis. *Folia* opposita, breviter petiolata, elliptica, obtusa, basi attenuata, suprà viridia, subtùs albida, lepidota, $2\frac{1}{2}$ uncias longa, $1\frac{1}{2}$ unciam lata. *Racemi* erecti, terminales, rariùs axillares, solitarii, interdùm binati: *bracteis* oblongis, acutis, utrinque villosis. *Calyx* turbinato-campanulatus, externè pubescens, lepidotus. *Corolla* 4-petala: *petalis* cuneatis, unguiculatis, apice crenatis, subflabellatis, venosis, calyci subæqualibus, patentissimis. *Stamina* 8, longè exserta. *Antheræ* bilobæ. *Stylus* stamina paulò superans. *Stigma* acutum. *Capsula* clavata, 4-alata, brevè pedicellata.

16. *C. laxum*, scandens, glabrum; foliis ovatis, spicis erectis laxifloris, calycibus pubescentibus, petalis subrotundis calyce brevioribus.

C. laxum. *Jacq. Amer. p.* 104. *Ed. Pict. p.* 53. *Linn. Sp. Pl. ed.* 3. *p.* 496. *Lam. Illus. Gen. t.* 282. *f.* 1. *Willd. Sp. Pl.* ii. *p.* 319. *Pers. Synop.* i. *p.* 411. *Spreng. Syst.* ii. *p.* 331.

C. spicis laxis. *Læfl. Itin. p.* 308. *Swartz. Obs. p.* 143. Gaura fruticosa scandens, foliis oppositis. *Læfl. Itin. p.* 248.

Habitat in insulis Caribæis. ♄.

Frutex scandens, glaber. *Folia* opposita, petiolata, ovata, obtusè acuminata, glabra, tripollicaria. *Spicæ* erectæ, laxæ, axillares

axillares et terminales, tripollicares. *Flores* exigui, albi, brevissimè pedicellati. *Calyx* 4-dentatus, acutus. *Corolla* 4-petala : *petalis* subrotundis, obtusis, concavis, patentissimis, calyce brevioribus. *Stamina* 8, longissimè exserta, fundo calycis inserta. *Capsula* 4-alata, brevè pedicellata.

17. *C. mexicanum*, humile, glabrum ; ramulis novellis compressis, foliis ellipticis membranaceis basi subcordatis, paniculâ polystachyâ, spicis ferrugineo-tomentosis brevibus multifloris, petalis subreniformibus calyce brevioribus.

C. mexicanum. *Humb. et Bonpl. Pl. Æquin.* ii. *p.* 156. *t.* 132. *Kunth Nov. Gen. et Sp. Pl.* vi. *p.* 111. *Syn.* iii. *p.* 398.

Habitat in locis maritimis prope Acapulca Mexicanorum. (*Humb. et Bonpl.*) ♄.

Frutex sesquiorgyalis ; *ramulis novellis* compressiusculis, glabris, fusco-cinereis. *Folia* opposita, breviter petiolata, elliptica, acuminata, basin versus parùm angustata, obtusa v. cordata, membranacea, glabra, suprà nitida, 4 vel 4½ pollices longa, sesqui- vel bi-pollicem lata. *Petioli* fuscescenti-tomentosi. *Panicula* polystachya, ferrugineo-tomentosa : *spicis* oppositis, brevissimis, multifloris, cylindraceis, ferè uncialibus, patentibus. *Bracteæ* lanceolatæ, tomentosæ, ad basin angustatæ. *Flores* densissimi, sessiles, subsecundi, bracteolis subulatis ovario longioribus deciduis basi muniti. *Calyx* turbinato-campanulatus, externè ferrugineo-tomentosus, 4-dentatus : *dentibus* ovatis, acutis. *Corolla* 4-petala : *petalis* subreniformibus, concavis, albis, calyce brevioribus. *Stamina* 8, calyce triplò longiora, albida. *Antheræ* bilobæ, flavæ. *Stylus* stamina superans. *Capsula* 4-alata, sessilis.

18. *C. pul-*

18. *C. pulchellum*, scandens, puberulum; foliis elliptico-oblongis subtùs fuscescentibus, paniculâ polystachyâ, calycibus pedunculisque fusco-villosis, petalis subreniformibus reflexis.

C. pulchellum. *Mart. Mss.*

Habitat in Brasiliâ ad flumen Rio Negro. *Martius.* ♄. (v. s. in Herb. Lamb.)

Frutex scandens, ramis oppositis; *junioribus* puberulis. *Folia* opposita, brevè petiolata, elliptico-oblonga, aut ovato-oblonga, mucronata, 3—4 uncias longa, 2—2½ lata, suprà viridia, subtùs junioribusque fuscescenti-puberula. *Petioli* suprà fusco-villosi. *Panicula* polystachya, spicis oppositis, v. rariùs alternis, brevibus, confertifloris. *Flores* parvi, coccinei. *Calyx* turbinato-campanulatus, rachique fusco-pilosus, 4-dentatus: *dentibus* parvis, mucronato-cuspidatis. *Petala* subreniformia, reflexa, calyce paulò longiora. *Stamina* 8, calyce triplò longiora. *Capsula* 4-alata.

19. *C. racemosum*, scandens, glabrum; foliis ovato-oblongis acutis nitidis, paniculâ polystachyâ, spicis elongatis apice comosis, petalis lanceolatis obtusis.

C. racemosum. *Beauv. Fl. d' Oware et de Benin*, ii. *p.* 90. *t.* 118. *f.* 1.

Habitat in Africâ æquinoctiali ad Benin. *Beauvois.* ♄.

Frutex scandens, lævis: *ramis* teretibus. *Folia* breviter petiolata, oblonga, aut ovali-oblonga, acuta, glabra, suprà nitida, 3 uncias longa, 1½ unciam lata. *Panicula* polystachya: *spicis* oppositis, apice comosis. *Flores* mediocres, albi, breviter pedicellati. *Calyx* campanulatus, lævis, 4-dentatus. *Corolla* 4-petala: *petalis* lanceolatis, obtusis, calyce multò longioribus. *Stamina* 8, longè exserta. *Antheræ* bilobæ luteæ. *Capsula* 4-alata, breviter pedicellata.

20. *C. al-*

20. *C. albidum*, scandens, glabrum; foliis longè petiolatis oblongis obtusis aut suborbiculatis suprà punctatis viridibus subtùs albidis, paniculâ polystachyâ, spicis confertifloris, calycibus pubescentibus, petalis parvis.

C. laxum. *Roxb. Hort. Beng. p.* 88.

Habitat in Indiâ Orientali. *Roxburgh.* ♄. (v. s. in Herb. Banks. et Lamb.)

Frutex glaber, scandens, ramosissimus, laxus. *Folia* opposita, longè petiolata, oblonga, obtusa, aut suborbiculata, punctata, suprà viridia, subtùs albida. *Panicula* polystachya: *spicis* oppositis, confertifloris, uncialibus v. biuncialibus. *Flores* parvi, coccinei? *Calyx* turbinato-campanulatus, 4-dentatus: *dentibus* ovatis, acutis. *Corolla* 4-petala, parva. *Stamina* 8, longè exserta. *Antheræ* bilobæ, rotundatæ. *Stylus* crassus, staminibus æqualis. *Fructus* mediocris, 4-alatus.

21. *C. nanum*, erectum, humile; foliis oblongis ovatisve obtusis glabris, spicis simplicibus v. nunc basi ramosis, calycibus pubescentibus, petalis ovatis obtusis.

C. nanum. *Hamilton Mss. Don Prod. Fl. Nepal. p.* 219.

Habitat in Nepaliâ. *Hamilton.* ♄. (v. s. in Herb. Lamb.)

Frutex humilis, a palmari ad pedem altus, rigidus. *Folia* opposita, breviter petiolata, oblonga, vel ovalia, obtusa, glabra. *Spica* terminalis, interdùm basi ramosus, confertiflorus. *Flores* parvi, albi. *Calyx* campanulatus, 4-dentatus: *dentibus* ovatis, acutis. *Corolla* 4-petala: *petalis* ovatis, obtusis. *Stamina* 8, longè exserta. *Antheræ* bilobæ. *Stylus* staminibus æqualis.

22. *C. Roxburghii*, scandens, glabrum; foliis ovatis obtusis, paniculâ

culâ polystachyâ, spicis sparsifloris, rachi calycibusque pubescentibus.

Habitat in Indiâ Orientali. *Roxburgh.* ♄. (v. s. in Herb. Banks. et Lamb.)

Frutex scandens. *Folia* opposita, membranacea, pubescentia; *adulta* glabra, 2 uncias longa, $1\frac{1}{2}$ lata. *Fructus* 4-alatus, breviter pedicellatus.

✓23. *C. odoratum*, scandens; ramulis puberulis, foliis oblongis v. obovato-oblongis apice rotundatis subemarginatis coriaceis glabris, paniculâ polystachyâ, spicis confertifloris, petalis reniformibus.

C. odoratum. *Pav. Mss.*

Habitat in Guayaquil. *Pavon.* ♄. (v. s. in Herb. Lamb.)

Frutex scandens: *ramis* cylindricis, puberulis. *Folia* opposita, oblonga, v. obovato-oblonga, apice rotundata, subemarginata, cum mucrone brevi, integra, subcoriacea, utrinque glabra, basi subauriculata, $3\frac{1}{2}$—4 uncias longa, 2 v. $2\frac{1}{2}$ lata. *Petioli* glabri, $\frac{1}{8}$ unciæ longitudine. *Panicula* polystachya, spicis alternis, confertifloris. *Flores* coccinei? *Calyx* turbinato-campanulatus, obscurè 4-dentatus *Petala* 4, reniformia, integra. *Stamina* 8, calyce triplò longiora. *Capsula* 4-alata.

Sectio f.

24. *C. tomentosum*, scandens, fusco-tomentosum; foliis ovalibus mucronatis; adultis suprà nudiusculis, spicis sparsifloris, petalis ovalibus obtusis calyce paulò brevioribus, staminibus abbreviatis.

Habitat in Africâ æquinoctiali prope Sierra Leona. *Smeathman, Afzelius.* ♄. (v. s. in Herb. Banks. et Lamb.)

Frutex forsan scandens: *ramulis* pubescenti-tomentosis. *Folia* oblonga,

oblonga, aut sæpiùs ovalia, utrinque rotundata, apice breviter mucronata, brevè petiolata, coriacea, subtùs petiolisque fusco-tomentosa, adulta suprà glabriuscula, 3 uncias longa, $1\frac{1}{2}$ unciam lata. *Spicæ* axillares, solitariæ, quadriunciales, graciles, sparsifloræ. *Flores* sessiles, parvi, albi. *Calyx* turbinato-campanulatus rachique fusco-tomentosus, 4-dentatus: *dentibus* ovatis, acutis. *Corolla* 4-petala: *petalis* ovalibus, obtusis, dentibus calycis paulò longioribus. *Stamina* 8, brevia. *Fructus* 4-alatus.

25. *C. micranthum*, erectum; ramulis pubescentibus, foliis oblongis obtusè mucronatis; adultis glabris, spicis tenuibus, petalis lineari-cuneatis dentibus calycinis 4-plò longioribus, staminibus minùs exsertis.

Habitat in Africâ æquinoctiali prope Sierra Leona. *Smeathman*, *Afzelius*. ♄. (v. s. in Herb. Banks. et Lamb.)

Frutex erectus? *ramulis* ferrugineo-pubescentibus. *Folia* opposita, brevè petiolata, oblonga, aut ovata, obtusè mucronata; adulta glabra; juniora pubescentia. *Spicæ* axillares, solitariæ, tenues, vix unciam longæ, pubescentes. *Flores* parvi, coccinei, brevissimè pedicellati. *Calyx* turbinato-campanulatus, 4-dentatus: *dentibus* acutis. *Corolla* 4-petala: *petalis* lineari-cuneatis, obtusis, dentibus calycis 4-plò longioribus. *Stamina* 8, minùs exserta, petalis paulò longiora. *Fructus* parvus, 4-alatus, breviter pedicellatus.

26. *C. molle*, scandens? villosum; foliis oblongo-lanceolatis acuminatis basi cordatis, spicis elongatis, dentibus calycinis brevissimis, petalis exiguis obovatis? staminibus paulò exsertis.

C. molle. *R. Br. in App. to Salt's Travels in Abyssinia.*

Habitat in Abyssiniâ. *Salt*. ♄. (v. s. in Herb. Banks.)

Frutex scandens? villosus. *Folia* opposita, elliptico-oblonga, v. ovato-lanceolata, acuminata, basi cordata, brevè petiolata, subtùs rufo-villosa venisque ferruginea, $2\frac{1}{2}$ ad $4\frac{1}{2}$ uncias longa, $1\frac{1}{4}$ ad 2 uncias lata. *Spicæ* axillares, solitariæ, elongatæ. *Calyx* turbinato-campanulatus, rufo-villosus, 4-dentatus: *dentibus* parvis, cuspidatis? *Petala* parva, obovata, dentibus calycinis longiora? *Stamina* 8, calyce duplò longiora.

27. *C. latifolium*, scandens, glabrum; foliis amplis coriaceis oblongis acuminatis interdum rotundatis, spicis brevibus confertifloris, calycibus pubescentibus, petalis obovato-oblongis obtusis, staminibus paulò exsertis.
C. macrophyllum. *Roxb. Hort. Beng. p.* 88?
Habitat in Indiâ Orientali. *Roxburgh.* ♄. (v. s. in Herb. Lamb.)

Frutex glaber, scandens. *Folia* opposita, ampla, oblonga, acuminata, interdum rotundata, subcoriacea, glabra, 6 vel 7 uncias longa, 3 sive $3\frac{1}{2}$ lata. *Petioli* $1\frac{1}{2}$ unciam longi. *Spicæ* axillares, confertifloræ, $1\frac{1}{2}$ unciam longæ, in ramos juniores tantùm provenientes. *Flores* parvi, coccinei? *Calyx* turbinato-campanulatus, pubescens, 4-dentatus: *dentibus* ovatis, mucronatis. *Petala* parva, obovato-oblonga obtusa, dentibus calycis paulò longiora. *Stamina* 8, calyce duplò longiora. *Antheræ* bilobæ. *Stylus* stamina æquans. *Fructus* 4-alatus, breviter pedicellatus.

28. *C. chinense*, scandens, ferrugineo-lepidotum; foliis ellipticis utrinque acutis suprà viridibus, spicis laxifloris, petalis exiguis, staminibus paulò exsertis.
C. chinense. *Roxb. Hort. Beng. p.* 28.
Habitat in Chinâ. ♄. (v. s. in Herb. Lamb.)

Frutex

Frutex scandens, glaber, ferrugineo-lepidotus. *Folia* opposita, breviter petiolata, elliptica, glabra, utrinque acuta, subtùs ferruginea, suprà viridia, 3 uncias longa, 2 uncias lata. *Spicæ* axillares, laxifloræ, plerumque 2 uncias longæ. *Flores* mediocres, coccinei? *Calyx* turbinato-campanulatus, ferrugineo-lepidotus, 4-dentatus: *dentibus* brevibus, ovatis, acutis. *Petala* parva, calyce breviora. *Stamina* 8, calyce paulò longiora. *Antheræ* bilobæ. *Fructus* 4-alatus, breviter pedicellatus.

Divisio Secunda.

Sectio a.

29. *C. comosum*, scandens; ramulis pubescentibus, foliis ellipticis acutis basi subcordatis; adultis glabris, spicis apice comosis, bracteis lanceolatis acutis, petalis ligulatis obtusis.

Habitat in Africâ æquinoctiali prope Sierra Leona. *Smeathman*, *Afzelius*. ♄. (v. s. in Herb. Banks. et Lamb.)

Frutex scandens: *ramulis* pubescentibus. *Folia* opposita s. terna v. nunc quaterna, breviter petiolata, elliptica, acuta, basi subcordata, 9 uncias longa, 3 uncias lata; adulta glabra, nitida; juniora pubescentia. *Panicula* polystachya: *spicis* oppositis, ternis, quaternisve, apice corfertifloris, comosis. *Flores* mediocres, coccinei. *Bracteæ* lanceolatæ, acutæ. *Calyx* tubulosus, 5-dentatus: *dentibus* ovatis, acutis. *Corolla* 5-petala: *petalis* lanceolatis, obtusis, calyce multò longioribus. *Stamina* 10, longè exserta. *Stylus* staminibus longior. *Antheræ* rotundatæ, bilobæ. *Fructus* 5-alatus, breviter pedicellatus.

30. *C. intermedium*, scandens; ramulis pubescentibus, foliis el-

liptico-obovatis mucronatis; adultis glabris, spicis apice comosis, bracteis ovatis mucronatis, petalis ligulatis obtusis.

Habitat in Africâ æquinoctiali prope Sierra Leona. *Afzelius.* ♄. (v. s. in Herb. Lamb.)

Simillimum *Combreto comoso*, sed foliis elliptico-obovatis mucronatis, nec ellipticis acutis, floribus majoribus et densioribus, et bracteis ovatis mucronatis, nec lanceolatis acutis distinguitur.

31. *C. pilosum*, scandens; foliis oblongo-lanceolatis acuminatis basi auriculatis, spicis brevibus, calycibus pedunculisque fusco-pilosissimis, petalis obovato-oblongis ciliatis.

C. pilosum. *Roxb. Hort. Beng. p.* 28.

Habitat in Indiâ Orientali. ♄. (v. s. in Herb. Lamb.)

Frutex scandens, pilosus. *Folia* opposita, oblongo-lanceolata, acuminata, basi auriculata, brevissimè petiolata, 6 uncias longa, $2\frac{1}{2}$ lata; adulta glabriuscula. *Petioli* cum ramulis foliisque junioribus fusco-pilosissimi. *Spicæ* breves, confertifloræ, in paniculam congestam terminalem dispositæ. *Flores* magnitudine *C. comosi*, albi. *Calyx* tubuloso-campanulatus, pilosissimus, 5-dentatus: *dentibus* ovatis, mucronatis, cuspidatis. *Petala* obovato-lanceolata, obtusa, ciliata, calyce duplò longiora. *Stamina* 10, petalis duplò longiora. *Capsula* magna, oblonga, brevissimè pedicellata, pubescens, 5-alata.

32. *C. ovale*, erectum? foliis ovali-oblongis obtusis subtùs albidis; adultis glabris; novellis cum ramulis calycibusque pubescentibus, spicis laxifloris brevibus, petalis obovato-oblongis obtusis.

C. ovale.

C. ovale. *R. Br. in App. to Salt's Travels in Abyssinia.*
Habitat in Abyssiniâ. *Salt.* ♄. (v. s. in Herb. Lamb.)

Frutex erectus? ramosus: *ramulis* pubescentibus. *Folia* opposita, breviter petiolata, ovalia v. rotundata, utrinque obtusa, subtùs albida, unciam longa, $\frac{3}{4}$ unciæ lata; adulta glabra; juniora pubescentia. *Spicæ* axillares et terminales, laxifloræ, unciales v. biunciales. *Flores* parvi, forsan albi. *Calyx* tubulosus, 5-dentatus: *dentibus* ovatis, acutis. *Corolla* 5-petala: *petalis* obovato-lanceolatis, obtusis, calyce multò longioribus. *Stamina* 10, longè exserta, petalis multò longiora. *Antheræ* bilobæ. *Fructus* 5-alatus, pubescens, breviter pedicellatus.

33. *C. alternifolium*, scandens, glabrum; ramis spinescentibus, spinis recurvis, foliis alternis oblongis glabris suprà nitidis, spicis brevibus confertifloris, petalis lanceolatis obtusis calyce duplò longioribus.

C. alternifolium. *Jacq. Amer. p.* 104. *Willd. Sp. Pl.* ii. *p.* 320. *Pers. Synop.* i. *p.* 412. *Kunth Nov. Gen. et Sp. Pl.* vi. *p.* 111. *Syn.* iii. *p.* 399. *Spreng. Syst.* ii. *p.* 331.
C. decandrum. *Jacq. Amer. ed. Pict. p.* 53. *t.* 260. *f.* 27.
C. spinosum. *Humb. et Bonpl. Pl. Æquin.* ii. *p.* 161.
Habitat in Americâ æquinoctiali. (*Jacquin, Humb. et Bonpl.*) ♄.

Frutex scandens: *ramis* spinescentibus. *Spinæ* recurvæ (spinis subrectis geminis vel solitariis subulatis ex *Kunth*). *Ramuli* fuscescenti-tomentosi. *Folia* alterna, brevè petiolata, oblonga v. elliptica, obtusè acuminata, suprà nitida, 3 vel 4 uncias longa, 2 uncias lata. *Panicula* polystachya: *spicis* brevibus, sparsis, confertifloris. *Flores* parvi, albi, breviter pedicellati. *Calyx* tubulosus, 5-dentatus: *dentibus* ovatis, acutis.

acutis. *Corolla* 5-petala: *petalis* dentibus calycinis duplò longioribus. *Stamina* 10, longè exserta. *Antheræ* bilobæ. *Capsula* 5-alata, sessilis.

34. *C. Pavonii*, scandens; ramulis pilosis, foliis oblongis v. ovatis acuminatis mucronatis basi subcordatis subtùs ferrugineo-villosis, spicis elongatis sparsifloris, petalis lanceolatis.
C. decandrum. *Pavon Mss.*
Habitat in Guayaquil. *Pavon.* ♄. (v. s. in Herb. Lamb.)
Frutex scandens: *ramis junioribus* pilosis. *Folia* opposita, ovata, vel oblonga, acuminata, mucrone obtuso, basi subcordata, suprà glabra, subtùs ferrugineo-villosa, $4\frac{1}{2}$ ad 5 uncias longa, $2\frac{1}{2}$ ad $2\frac{3}{4}$ lata. *Petioli* brevissimi, $\frac{1}{4}$ unciæ longi, ferrugineo-villosi. *Panicula* polystachya: *spicis* elongatis, sparsifloris, oppositis alternisque. *Flores* mediocres, forsan coccinei. *Calyx* turbinato-campanulatus, cum ovariis pedunculisque ferrugineo-villosis, 5-dentatus: *dentibus* deltoideis, acutis. *Petala* oblongo-lanceolata, obtusa, calyce multò longiora. *Stamina* 10, petalis paulò longiora.

Sectio b.

35. *C. purpureum*, scandens, glabrum; foliis lanceolatis acutis atro-viridibus nitidis, spicis laxifloris, petalis elliptico-oblongis obtusiusculis.
C. purpureum. *Vahl Symb.* iii. *p.* 51. *Willd. Sp. Pl.* ii. *p.* 319. *Pers. Syn.* i. *p.* 411. *Spreng. Syst.* ii. *p.* 331.
C. coccineum. *Lam. Encycl.* i. *p.* 737. *Illust. t.* 282. *f.* 2.
Cristaria coccinea. *Sonnerat Itin.* ii. *p.* 247. *t.* 140.
Habitat in Madagascar. ♄. (v. v. c. et s. spont. in Herb. Banks. et Lamb.)
Frutex scandens, glaber. *Folia* opposita, brevè petiolata, lanceolata, acuta, nitida, atro-viridia. *Panicula* polystachya: *spicis*

spicis oppositis, laxifloris. *Bracteæ* lanceolatæ. *Flores* mediocres, coccinei, secundi. *Calyx* tubulosus, lævis, 5-dentatus : *dentibus* ovatis, acutis. *Corolla* 5-petala : *petalis* elliptico-oblongis, obtusiusculis, calyce multò longioribus. *Stamina* 10, longè exserta, coccinea. *Antheræ* bilobæ. *Stylus* longitudine staminum. *Stigma* obtusiusculum. *Fructus* 5-alatus.

36. C. *Afzelii*, scandens ; foliis oblongis ; adultis glabriusculis, spicis axillaribus terminalibusque, calycibus pubescentibus, petalis obovato-oblongis obtusis.

Habitat in Africâ æquinoctiali prope Sierra Leona. *Afzelius*. ♄. (v. s. in Herb. Lamb.)

Simillimum *Combreto grandifloro*, sed floribus decandris, nec octandris facilè dignoscitur.

Sectio c.

37. *C. decandrum*, scandens, fusco-pubescens ; foliis oblongis acuminatis ; floralibus flavicantibus, spicis numerosis confertifloris, petalis ovatis mucronatis, staminibus minùs exsertis.

C. decandrum. *Roxb. Corom. Pl.* i. *p.* 43. *t.* 59. *Hort. Beng. p.* 28. *Willd. Sp. Pl.* ii. *p.* 319. *Pers. Synop.* i. *p.* 411.

C. Roxburghii. *Spreng. Syst.* ii. *p.* 331.

Habitat in Indiâ Orientali. *Roxburgh*. ♄. (v. s. in Herb. Banks. Lamb. et Soc. Linn.)

Frutex scandens : *ramulis* fusco-pubescentibus, cortice cinereo. *Folia* opposita, brevè petiolata, oblonga, longè acuminata, pubescentia, 6 uncias longa, $2\frac{1}{2}$ lata, venis longitudinalibus prominentibus ; *floralia* flavicantia, pubescentia. *Petioli* $\frac{1}{4}$ unciæ longi, fusco-pubescentes. *Paniculæ* compositæ,

sitæ, polystachyæ, axillares, et terminales: *spicis* numerosis, confertifloris, cum rachibus calycibusque rufo-pubescentibus. *Flores* parvi, albi, bracteis breviores. *Calyx* turbinato-campanulatus, 5-dentatus. *Corolla* 5-petala: *petalis* ovatis, acutis, calyce multò longioribus. *Stamina* 10, brevia. *Fructus* 5-alatus, breviter pedicellatus.

38. *C. puberum*, scandens, glabrum; foliis oblongis coriaceis basi subcordatis suprà nitidis, spicis numerosis confertifloris, rachi calycibusque ferrugineis, staminibus brevibus.

C. puberum. *Richard in Act. Soc. Hist. Nat. Paris.* i. *p.* 108.

Habitat in Americâ meridionali. *Richard.* ♄. (v. s. in Herb. Lamb.)

Ramis, *rachibus*, *germinibus*que rufo-pubentibus, foliis ovatis setaceo-acuminatis, spicis paniculatis. *Richard. l. c.*

Panicula diffusa, composita: *spicis* numerosis.

39. *C. squamosum* scandens, lepidotum; foliis ovatis acuminatis coriaceis subtùs calycibusque ferrugineis, spicis laxifloris, petalis exiguis, staminibus brevibus.

C. squamosum. *Roxb. Hort. Beng. p.* 88.

Habitat in Indiâ Orientali. *Roxburgh.* ♄. (v. s. in Herb. Soc. Linn.)

Frutex scandens, glaber: cortice cinereo. *Folia* opposita, ovata, acuminata, coriacea, glabra, lepidota, subtùs ferruginea, suprà viridia, 5 uncias longa, $2\frac{1}{2}$ lata. *Petioli* $\frac{1}{4}$ unciæ longi, ferruginei. *Panicula* polystachya: *spicis* oppositis, laxifloris, cum rachi calycibusque ferrugineo-lepidotis. *Flores* parvi, inconspicui. *Calyx* turbinato-campanulatus, 5-dentatus. *Corolla* 5-petala. *Stamina* brevia.

40. *C. tri-*

40. *C. trifoliatum*, scandens; foliis ternis oblongis acutis, spicis laxifloris, floribus secundis, rachi calycibusque pubescentibus, petalis exiguis calyci subæqualibus.

C. trifoliatum. *Vent. Choix des Plantes*, *p.* 58. *t.* 58. *Spreng. Syst.* ii. *p.* 331.

Habitat in Javâ. *D. La Haye.* ♄.

Frutex scandens. *Folia* terna, breviter petiolata, ovali-oblonga, glabra. *Panicula* polystachya: *spicis* ternis, laxis. *Flores* colore herbaceo secundi, distichi, bracteis linearibus longiores. *Calyx* turbinato-campanulatus, extùs pubescens, 5-dentatus. *Corolla* 5-petala, brevis. *Stamina* 10, longè exserta. *Fructus* oblongus, 5-alatus, sessilis.

Sectio d.

41. *C. sericeum*, suffruticosum, erectum; foliis suboppositis lanceolatis obtusiusculis subtùs sericeo-villosis, spicis confertifloris, rachi ovariisque cum calycibus villoso-tomentosis, petalis calyci subæqualibus, staminibus paulò exsertis.

Habitat in Africâ æquinoctiali prope Sierra Leona. *Smeathman*, *Afzelius.* ♄. (v. s. in Herb. Banks. et Lamb.)

Caulis suffruticosus, villosus. *Folia* subopposita, lanceolata, obtusiuscula, subtùs sericeo-villosa, suprà venis villosis, $3\frac{1}{2}$ uncias longa, $1\frac{1}{2}$ unciam lata. *Petioli* $\frac{1}{2}$ unciæ longi, villosi. *Spicæ* axillares, solitariæ, biunciales. *Flores* albi, breviter pedicellati. *Calyx* turbinato-campanulatus, extùs villosus, 5-dentatus: *dentibus* ovatis, acutis. *Corolla* 5-petala, parva, calyci ferè æqualis, vel eodem paulò brevior. *Stamina* 10, paulò exserta. *Stylus* validus, teres, longitudine staminum. *Fructus* 5-alatus.

* Species non sufficienter notæ, sed evidenter distinctæ.

42. *C. obtusifolium*, foliis obovatis obtusis glabris, floribus paniculatis. *Rich. in Act. Soc. Hist. Nat. Paris.* i. *p.* 108.
Habitat in Americâ meridionali. *Richard.* ♄.

43. *C. rotundifolium*, foliis subsessilibus rotundatis mucronatis.
C. rotundifolium. *Rich. in Act. Soc. Hist. Nat. Paris.* i. *p.* 108.
Habitat in Americâ meridionali. *Richard.* ♄.
Foliis subsessilibus subrotundis utrinque obtusis mucrone abrupto acuto: grandiflorum. *Rich. l. c.*

44. *C. ferrugineum*, foliis brevè petiolatis lanceolatis acuminatis glabris basi attenuatis subtùs ferrugineis, spicis axillaribus terminalibusque.
Habitat in Americâ meridionali. ♄. (v. s. in Herb. Banks.)

45. *C. cordatum*; foliis breviter petiolatis amplis subrotundocordatis; novellis pubescentibus, paniculâ spicatâ terminali.
Habitat in Insulâ Hispaniolâ. ♄. (v. s. in Herb. Banks.)
Flores parvi.

** Species adhuc valdè dubiæ, quarum nomina trivialia in *Catalogo Horti Botanici Calcutensi* solummodo reperiuntur.

46. *C. ovalifolium*. *Roxb. Hort. Beng. p.* 28.
Habitat in Coromandeliâ. *Roxburgh.* ♄.

47. *C. acuminatum*. *Roxb. Hort. Beng. p.* 28.
Habitat in Bengaliâ *Roxburgh.* ♄.

48. *C. cos-*

48. *C. costatum. Roxb. Hort. Beng. p.* 28.
Habitat in Indiâ orientali. *Roxburgh.* ♄.

49. *C. rotundifolium. Roxb. Hort. Beng. p.* 88.
Habitat in Bengaliâ orientali *Roxburgh.* ♄.

Note.—In the prefatory page of this monograph the number of species has been inadvertently stated at forty-one instead of *forty-five*, exclusive of the four whose names occur in Dr. Roxburgh's *Hortus Bengalensis*.

XIX. *Description of a new Genus of Plants belonging to the Order Nymphæaceæ: in a Letter to H. T. Colebrooke, Esq., F.R.S., F.L.S. By Nathaniel Wallich, M.D., F.L.S., F.R.S. Ed., &c.*

Read May 1, 1827.

BARCLAYA*. *Wall.*

LINN. SYST. *Polyandria Polygynia.*

ORDO NAT. *Nymphæaceæ.* Trib. 2. *Decand. Syst. Nat.* ii. *p.* 48.

CHAR. GEN. *Sepala* quinque distincta, infra ovarium thalamo inserta. *Torus* basi in ovarium globosum ampliatus; inde tubulosus, corollaceus, staminiferus, fauce 8—10-lobâ, lobis inæqualiter bi- v. tri-serialibus, conniventibus. *Stamina* plurima, nutantia, tubo tori intùs adfixa eodemque inclusa; superiora sterilia, ramosa. *Antheræ* nudæ. *Styli* plures fundo tubi radiatim inserti, supra foveam verticis ovarii conniventes, basi connati. *Bacca* carnosa, globosa, calyce suffulta corollâque coronata persistentibus, multilocularis, polysperma. *Semina* globosa, setis carnosis obtecta, albuminosa, inversa.

Habitus. *Herba* facie *Potamogetonis*, in aquis stagnantibus proveniens,

* This very curious and interesting genus I have dedicated to my highly respected friend Robert Barclay, Esq. of Bury Hill, a most worthy benefactor to the science of Botany.

veniens, gracilis, foliis perquàm tenuibus, elongatis, oblongis, basi paulò angustatâ cordato-subhastatis, minimè peltatis, penninerviis, fluctuantibus v. natantibus lucidis, subtùs ferrugineis, leviter tomentosis. *Scapi* uniflori, petiolique graciles, longi. *Flores* erecti, glabri, ex viridi livescentes, inodori, sesquipollicares.

Genus a cæteris *Nymphæaceis* valdè distinctum structurâ et formâ foliorum, et florum. Ab *Euryale* differt calyce distincto absolutè hypogyno; a *Nymphæâ* toro supernè corollaceo, tubuloso, ad limbum multilobo, intùs staminifero.

BARCLAYA LONGIFOLIA. *Wall.*

TAB. XVIII.

Legi in Pegu, prope Rangoon, in aquis stagnantibus, florentem baccisque ferè maturis mense Augusto 1826.

Rhizoma teres, carnosum, semipollicare, vix digitum minimum crassum, album, inodorum, simplex, fibras emittens longas, gracillimas, copiosas, apice fibrillosas; supernè exerens scapos petiolosque numerosos, læves, graciles, pennâ columbinâ vix crassiores, spongioso-carnosos, fuscos, basi albicantes, pedales bipedalesque, forsan longiores, absque squamis bracteisve intermixtis. *Folia* oblonga, utrinque parùm attenuata, obtusa, 8—10-pollicaria, ad medium sesquiunciam v. duas et dimidium pollices lata, marginibus parùm inæqualibus undulata, sub lente denticulis minutis hyalinis notata, basi cordato-subsagittata, lobis omninò liberis, unguicularibus, rotundato-obtusis, ovatis, parùm divaricatis, sinu acutangulo; membranacea, tenuissima, frondes *Ulvæ* vel *Fuci* quodammodò referentia, subdiaphana, ad lucem visa minutissimè punctulata, quasi vesiculosa, suprà atro-viridia, lucida; subtùs opaca, ferruginea, nunc purpurascentia, tomento parco,

parco, farinaceo, facilè solubili conspersa, præcipuè juxta tractus vasorum, costâ gracili, elevatâ, nervisque copiosis, filiformibus, alternantibus, inferioribus suboppositis, sat magnâ e peripheriâ distantiâ bifurcatis, arcuatim anastomosantibus; nervis verò ipsius baseos brevissimis, vix elevatis, obsoletè radiantibus, ita ut folium ipsum nullo modo palminervium dici potest: venis capillaceis remotis, vix elevatis, maximè reticulatis. Vernatione sunt involuta secus margines ambos, in cylindrum utrinque planiusculum, propter nervos decussatim annulatum; folia tenellæ plantæ lineari-oblonga, basi rotundata integra, vel levissimè retusa. *Petiolus* parùm attenuatus, costæ folii absque articulo v. intumescentiâ continuus, ipsâque laminâ bis terve longior. *Scapi* plures, pedales et paulò ultrà, petiolis breviores, iisdemque parùm crassiores, sursùm leviter ampliati, subclavati, omninò ebracteati, apice parùm supra aquæ superficiem elevati, uniflori. *Flos* carnosus, viridis, sesquipollicem longus, diametro ferè biunciali, inodorus, involucro bracteisque destitutus; æstivatione oblongo-cylindricus, quinque-carinatus, apice quinque-cornutus, calyce secus margines sepalorum imbricato involutus. *Sepala* quinque, distincta, imâ basi vix connata, thalami paululùm dilatati continua, stellatim patentissima, lineari-oblonga, apice obtuso nunc concaviusculo vel intùs in lobulum exiguum producto, pollicaria, plana, disco subcarnosa, marginibus membranaceis, parallelis, nunc subrecurvis, integerrimis, lineas quatuor lata, basi leviter contracta, suprà lævissima, pallida, subtùs ferruginea seu purpurascentia, costâ valdè elevatâ, extrorsùm latiore, obtusè carinatâ, in cuspidem ultra apicem sepali integram, liberam productâ, bi- tri- quadri-linearem, verticalem, complanatam, curvam, subfalciformem. *Torus* carnosus, crassiusculus, lævis, lagenæformis, inferiore parte paulò majore, in globum

globum ampliatus cerasum parvum magnitudine æquantem, superficie parùm et irregulariter undulatum, ipsâ substantiâ suâ fovens ovarium, basi sepalis suffultum, vertice abientem in tubum, alteram et breviorem tori partem efficientem, amplum, cylindricum, corollaceum, monophyllum, diametro 5 lineas emetientem, basi vix dilatatum, limbo laxiùs imbricato, obtuso, convexo, ferè clauso, 8—10-lobo: *lobi* triplici serie irregulariter ordinati; *harum series exterior* bi- vel tri-loba lobis linearibus, erectis, distantibus, subadnatis medio tubi, nunc vertici ipsius globi germiniferi insertis; *intermedia* 3—4-loba, lobis reliquis majoribus, oblongis, vel subovatis, basi contractis; *interior v. tertia* uni- v. bi-loba, lanceolata, occulta: *lobulis* planis, carnosis, intùs uti cum tubo (exceptâ hujus basi albidâ) atro-sanguineis, nitidis. *Stamina* plurima, brevissima, libera, tubo intùs quadruplici vel quintuplici serie alternatim inserta, inclusa, transversalia, emarcescentia: *filamenta* subulata, lævia: *antheræ* lineares, vix tertiam lineæ longitudine æquantes, albidæ, nudæ, obtusæ, nutantes, apici filamentorum insertæ, biloculares, utrinque dehiscentes. Præterea series duæ terminales, intra faucem tubi, constantes staminibus reliquis parùm majoribus, sterilibus, subulatis, hamosis, ad medium (curvaturam scilicet) subincrassatis et compressiusculis, apice acutis, deorsumque incurvis, flavis, basi sanguineis. *Ovarium* globosum, majorem infimamque tori partem constituens, vertice intra tubum foveâ infundibuliformi ad centrum usque exsculptum, carnosum, radiatim 12- vel 12-loculare: *loculis* compresso-prismaticis, verticalibus, pulpâ gelatinosâ repletis, maturitate fructûs ferè absorptâ, fortassè in villos istos seminum inspissatâ, in quâ nidulant ovula copiosa, globosa, scrobiculatim punctata, glabra et imberbia, parietibus, *i. e.* septis adfixa, transversalia. *Styli* tot quot loculi, verticem ovarii serie simplici

plici ambientes, basin tubi intùs, a staminibus paululùm remoti, definientes, basinque ejus non solùm, sed et summam ovarii foveam, excepto centro perforato, obtendentes, convergentes, sanguinei, basibus in annulum planum connati, apicibus subadscendentibus, liberis, subulatis, obtusis, flavicantibus. *Stigmata* simplicia, inconspicua, obtusa. *Bacca* sphærica, diametro cerasi magni, lævis, e viridi rufescens, calyce suffulta tuboque corollæ coronata immutatis (emarcescentibus ?) 10-locularis, parietibus, septis, axisque dimidiâ parte inferiore carnosis, albidis, crassiusculis ; axis verò parte superiore propter foveam terminalem ovarii maturitate contractam perforatâ. *Loculamenta* ferè sicca, v. succo glutinoso parcè donata, seminibus ferè tota repleta. *Semina* valdè copiosa, viridi-fuscescentia, exactissimè globosa, grano sinapeos nigri vix minora, densè obsita et quasi echinata setis v. pilis hyalinis, longiusculis, patentibus, mollissimis, succulentis basi adfixa parietibus lateralibus locu-lorum, vertice obsoletè umbilicata, setarum fasciculo rectiore densioreque notata. *Integumentum* simplex, tenue, membranaceum. *Albumen* niveum, grumosum, constans globulis grandiusculis, facillimè attritu solubilibus, rotundis. *Embryo* extra albumen positus, intra umbilicum (insertioni seminis oppositum ?) ovatus, minimus. (Structura baccæ corrigenda : *Vide infrà*).

The account which I have given above, will, I trust, convey a tolerable idea of this singular, and, as far as my means enable me to judge, new, and hitherto, unnoticed genus. Should it be found defective in perspicuity, I anxiously request it may be kept in mind, that the description was written on the spur of the moment, far away from any, except the most necessary scientific aids,

aids, surrounded by a great variety of novel plants requiring immediate examination, not long after my arrival at Rangoon, and on the very eve of departing on a distant journey to Ava. I believe I have not omitted any thing that is of importance; but in case I have, the accompanying rough sketches of the flower may perhaps serve to supply what is wanting in that respect.

The plant grows in great abundance towards the margins of tanks; it is smooth and slender, not slimy; the root fixed to the bottom; the leaves at first submersed, afterwards floating, exceedingly thin, oblong, cordate, without the slightest tendency to become peltate. I should have observed, that sometimes, though exceedingly rarely, a leaf is to be seen having one or both margins marked with one or two obtuse short lobes, but this circumstance must be viewed in the light of a monstrosity. The flowers are without any beauty; but this defect is amply made up by their very singular structure, widely differing from that of *Nelumbo*, *Nymphæa*, *Euryale*, and *Nuphar*; that is, from any of the members of the order, to which it unquestionably belongs. From *Podophylleæ*, DeCand. the plant is as remote as any of those genera. The flowers are fleshy, smooth and green: the calyx on the outside purplish-green; the raised part within it stained with pink; the rest of a shining sap-green colour without, and deep-red (atro-sanguineous) on the inside.

The above was written yesterday.—To my great delight, a berry which I had placed on my table the night before has ripened fully, and by taking it into my hand it spontaneously separated into two or three pieces along the dissepiments. Each cell is easily separable, consisting of a soft mealy fleshy parenchyma, pinkish-white; the outer margin coated with a thin membrane (which forms the outside of the berry); the inner margin (that which looked toward the axis) oblique above and straight underneath; sides with obliquely-ascending furrows.

The membrane lining the excavation at the top separates spontaneously (the styles remaining attached to it), as well as the tube of the torus; so does also the calyx, remaining attached to the apex of the scape. The character of the genus must therefore be modified in the following manner:

Tubus tori, annulus stylorum (cum membranâ foveam ovarii tegente) et calyx maturitate seorsim decidui. *Bacca* matura delabens in carpella numero loculorum correspondentia, indehiscentia? lateribus obliquè rugoso-sulcatis, carne mollissimo, ferè exsucco, farinaceo-grumoso, ex albo rubicundo.

RANGOON, August 31, 1826.

EXPLANATION OF TAB. XVIII.

Fig. 1. A flower;—natural size.

Fig. 2. Longitudinal view of a flower;—magnified.

a. Apex of the scape.

b. The thalamus. *c.c.c.* Sepals. *d*. Corollaceous torus. *e*. Limb of the same. *f*. Fertile stamens. *g*. Sterile stamens. *h*. Section of the ovarium. *i*. Ovula. *j*. Radii or ducts connecting the stigmata with the cells of the ovarium. *k*. Styles.

Fig. 3. Ovarium with the corollaceous torus removed, and surmounted by the stigmata;—magnified.

Fig. 4. Corollaceous torus separate.

Fig. 5. Fertile stamen.

Fig. 6. Sterile ditto.

Fig. 7. Ovarium divided horizontally, to show the cells;—enlarged.

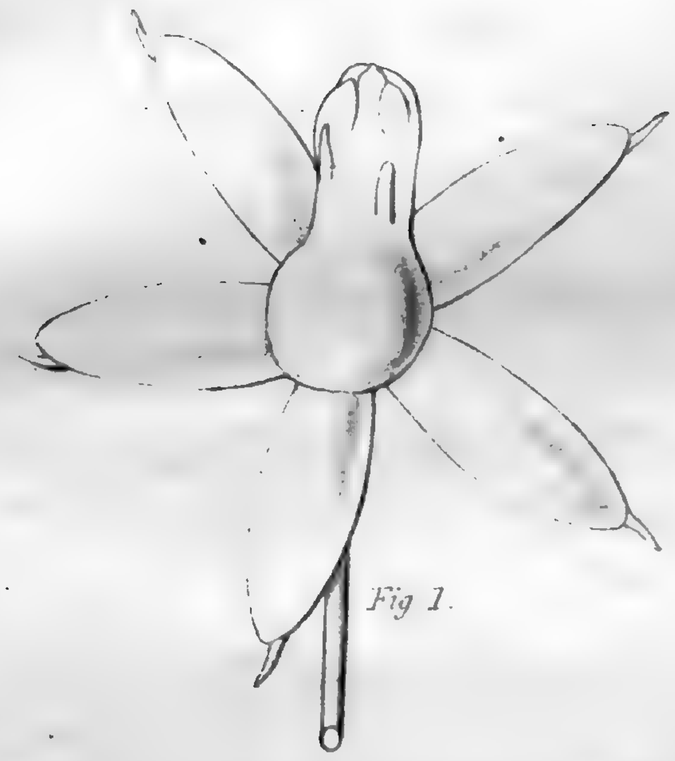


Fig 1.

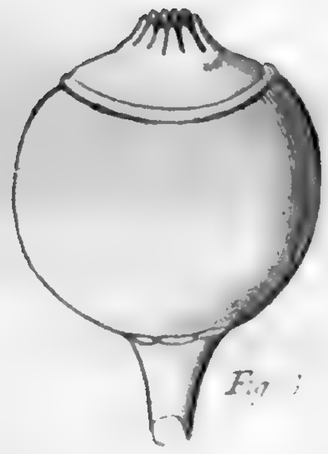


Fig 3

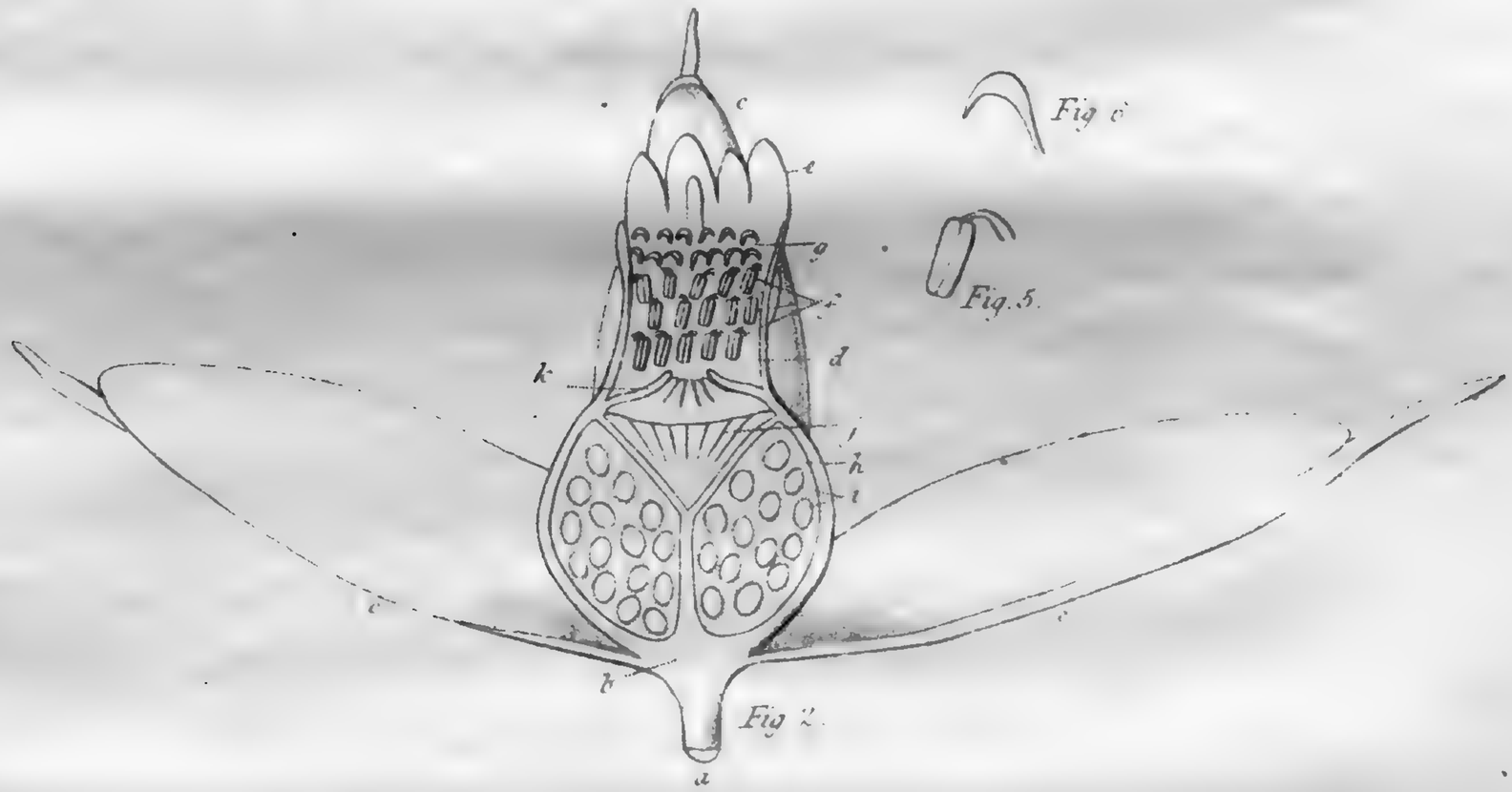


Fig 2.

Fig 6

Fig. 5.

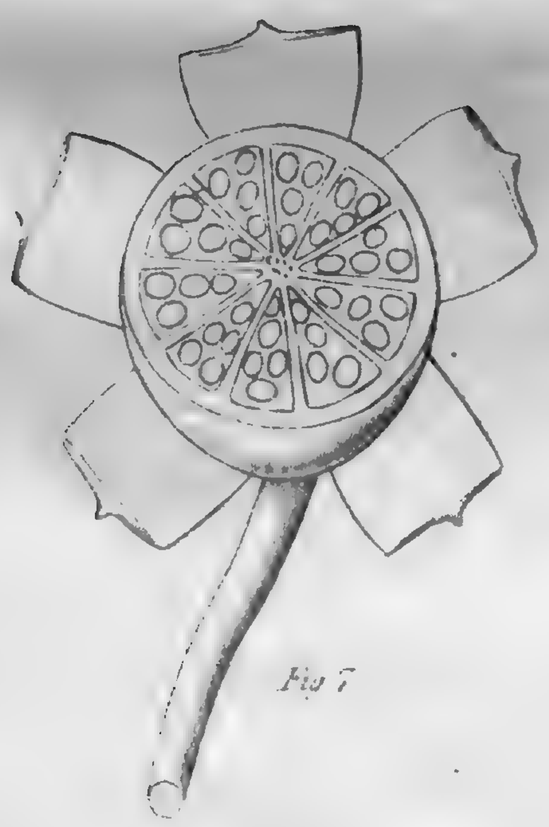


Fig 7

Fig 4.

XX. *Observations and Experiments, made with a view to ascertain the Means by which the Spiders that produce Gossamer effect their aërial Excursions. By John Blackwall, Esq., F.L.S.*

Read June 5, 1827.

Although it is well known that spiders sometimes ascend into the atmosphere through the instrumentality of fine lines of a viscous gummy matter, which proceed from the papillæ situated at the extremity of the abdomen, yet the manner in which these aërial journeys are effected still remains involved in obscurity, and considerable diversity of opinion exists as to the particular species of spider by which they are undertaken. This deficiency leaves open a wide field for speculation; and accordingly we find, that natural historians have ascribed this interesting occurrence to several distinct causes,—such as the agency of winds, evaporation, and electricity; the exercise of peculiar physical powers, with which the spiders that produce gossamer have been supposed to be endowed; and the extreme levity of the webs of these insects, which are represented by some writers on the subject to be of less specific gravity than atmospheric air*: but that each of these hypotheses is unfounded, and in direct oppo-

* For a concise statement of the principal circumstances which have given rise to the above conjectures, and for references to the sources from which they are derived, see the *Introduction to Entomology* by Kirby and Spence, Letter xxiii.

sition to facts, will be rendered evident by the following observations and experiments, from which a satisfactory solution of the difficulty, it is hoped, will be obtained.

That gossamer, which usually abounds most in the months of September and October, is perceived to ascend into the atmosphere only in serene bright weather, is, I believe, generally allowed: it is also admitted, that gossamer in the air is invariably preceded by gossamer on the ground. These, as will appear in the sequel, are circumstances of much importance in the present investigation; every method of accounting for the ascent of the webs and spiders, however plausible, which does not imply their concurrence, being necessarily erroneous.

But to proceed to my own researches:—A little before noon on the 1st of October 1826, which was a remarkably calm sunny day, the thermometer in the shade ranging from 55°·5 to 64°, I observed that the fields and hedges in the neighbourhood of Manchester were covered over, by the united labours of an immense multitude of spiders, with a profusion of fine shining lines, intersecting one another at every angle, and forming a confused kind of net-work. So extremely numerous were these slender filaments, that in walking across a small pasture my feet and ankles were thickly coated with them: it was evident, however, notwithstanding their great abundance, that they must have been produced in a very short space of time, as early in the morning they were not sufficiently conspicuous to attract my notice; and on the 30th of September they could not have existed at all; for on referring to my meteorological journal, I find that a strong gale from the south prevailed during the greater part of that day.

A circumstance so extraordinary could not fail to excite curiosity; but what more particularly arrested my attention was the ascent of an amazing quantity of webs of an irregular complicated

complicated structure, resembling ravelled silk of the finest quality and clearest white. They were of various shapes and dimensions, some of the largest measuring upward of a yard in length, and several inches in breadth in the widest part; while others were almost as broad as long, presenting an area of a few square inches only.

These webs, it was quickly perceived, were not formed in the air, as is generally believed, but at the earth's surface. The lines of which they were composed being brought into contact by the mechanical action of gentle airs, adhered together, till by continual additions they were accumulated into flakes or masses of considerable magnitude, on which the ascending current, occasioned by the rarefaction of the air contiguous to the heated ground, acted with so much force as to separate them from the objects to which they were attached, raising them in the atmosphere to a perpendicular height of at least several hundred feet. I collected a number of these webs about mid-day as they rose, and again in the afternoon, when the upward current had ceased and they were falling, but scarcely one in twenty contained a spider; though on minute inspection I found small winged insects, chiefly aphides, entangled in most of them.

From contemplating this unusual display of gossamer, my thoughts were naturally directed to the animals which produced it; and the countless myriads in which they swarmed almost created as much surprise as the singular occupation that engrossed them. Apparently actuated by the same impulse, all were intent upon traversing the regions of air; accordingly, after gaining the summits of various objects, as blades of grass, stubble, rails, gates, &c., by the slow and laborious process of climbing, they raised themselves still higher by straightening their limbs; and elevating the abdomen, by bringing it from the usual

usual horizontal position into one almost perpendicular, they emitted from their spinning-apparatus a small quantity of the glutinous secretion with which they construct their webs. This viscous substance being drawn out by the ascending current of rarefied air into fine lines several feet in length, was carried upward, until the spiders feeling themselves acted upon with sufficient force in that direction, quitted their hold of the objects on which they stood, and commenced their journey by mounting aloft.

Whenever the lines became inadequate to the purpose for which they were intended, by adhering to any fixed body, they were immediately detached from the spinners, and so converted into terrestrial gossamer by means of the last pair of legs, and the proceedings just described were repeated; which plainly proves that these operations result from a strong desire felt by the insects to effect an ascent. But what, it may be asked, is the exciting cause of this singular propensity? It has been suggested that hunger, or an inclination to procure some favourite kind of food, may supply the requisite stimulus. These suppositions, however, are discountenanced by the plump appearance which the animals exhibit; by their total disregard of such winged insects as happen to be placed within their power; by their utter inability to regulate their motions, while afloat, in any other manner than by letting out or drawing in the lines by which they are conveyed through the air, and thus promoting their ascent or descent; by the unsuitableness of the lines for securing their prey; and lastly, by the uncertainty when a favourable day for their purpose may occur, or even that one may occur at all.

Were I to hazard a conjecture on the subject, I should be disposed to attribute the manifest anxiety of these insects to change

change their quarters, to a feeling of insecurity occasioned by their proximity to one another ;—the prodigious numbers which in favourable seasons are usually congregated together affording the more powerful individuals an opportunity, seldom neglected by these voracious creatures, of making an easy prey of the weaker : and this opinion is strengthened, if not confirmed, by the fact, that they are chiefly animals which have not arrived at maturity that undertake these migrations.

I have asserted, that when the spiders which produce gossamer perform their aërial journeys, they are borne upward by an ascending current of rarefied air acting on the slender lines which proceed from their spinners. I shall now endeavour to prove that this curious atmospherical phænomenon, which well deserves the attention of meteorologists, affords them the only available means of accomplishing their object; and that the hypotheses previously adverted to are quite irreconcileable with facts, and consequently must be erroneous.

It has been already stated, that gossamer is never seen floating in the air except in calm sunny weather ; its buoyancy, therefore, evidently does not depend upon the agency of winds, usually so called : indeed it is probable that winds never do take an upward direction, unless influenced by some extraordinary circumstance or local peculiarity ; the ascent of gossamer, on the contrary, is frequently observed to take place over a great extent of country on the same day. It was noticed on the 1st of October, for example, in England, Wales, and Ireland.

If a satisfactory explanation of this interesting fact cannot be derived from the operation of winds, it is still less likely to be deduced from the action of evaporation or electricity ; for, not to insist upon the probable, I had almost said absolute, insufficiency of these powers considered as agents, experiments show that the spiders do not select those periods for making an ascent

when

when the evaporating force is unusually great, or the electricity of the atmosphere is remarkable for its intensity*.

But though each of the alleged causes just adverted to appears incompetent to produce the required effect, yet one abundantly adequate may perhaps be found in the physical endowments of the animals themselves, or in the extreme lightness of their webs: these two last-named suppositions therefore merit a careful examination.

If the spiders do impel their lines upward by the voluntary exercise of some animal function which has hitherto eluded the researches of physiologists, it follows, that when the communication is interrupted, the lines, unless influenced by some other force, must necessarily fall. Now the reverse of this uniformly ensues: for if the insects, after having commenced their ascent, are suddenly separated from the lines to which they are attached, the latter still continue to ascend, their motion being accelerated by their diminished gravity, but the former are rapidly precipitated to the ground. The conclusion is obvious. The buoyancy of the lines cannot be occasioned by the beings which produce them; and the ascent of large flakes of web unoccupied by spiders, before alluded to, confirms this opinion.

Perhaps the buoyancy of lines from which spiders have been detached, and of webs altogether destitute of these insects, may be regarded as facts powerfully contributing to establish the idea that this animal secretion is specifically lighter than the mixed gases which compose the atmosphere. The fallacy of this notion, however, is easily proved by experiment. In the

* The evaporating force may be determined by the atmometer, or from the temperature at which the aqueous vapour in the atmosphere begins to be condensed into water, and the temperature of the air. See the first series of the *Memoirs of the Literary and Philosophical Society of Manchester*, vol. v. part ii. p. 588. The electrical state of the atmosphere is shown by Bennet's gold-leaf electrometer.

compa-

comparatively still air of a room without fire, both the lines and webs descend slowly to the floor, the latter falling with the greater degree of velocity.

Were these productions lighter than atmospheric air, or were the spiders capable of effecting an ascent without the help of adventitious aid, a calm though cloudy day might answer their purpose; but as considerable warmth is required to produce an ascending current of rarefied air strong enough to bear them from the earth, a bright as well as still day is indispensable.

Founded on results obtained from an experiment which has been frequently made, but never conducted with sufficient care, is the belief entertained by many eminent entomologists that spiders can forcibly propel or dart out threads from their papillæ. Now as this process would, contrary to my own experience, imply the exercise of a physical power peculiar to these creatures; and as attempts have been made to explain on this principle the fabrication of their webs in situations where their ordinary mode of proceeding could not be employed, I determined to repeat the experiment from which so strange a conclusion has been deduced. With this view, having procured a small branched twig, I fixed it upright in an earthen vessel containing water, its base being immersed in the liquid, and upon it I placed several of the spiders which produce gossamer. Whenever the insects thus circumstanced were exposed to a current of air, either naturally or artificially produced, they directly turned the thorax towards the quarter whence it came, even when it was so slight as scarcely to be perceptible, and elevating the abdomen, they emitted from their spinners a small portion of glutinous matter, which was instantly carried out in a line, consisting of four finer ones, with a velocity equal, or nearly so, to that with which the air moved, as was apparent from observations made on the motion of detached lines similarly exposed. The spiders, in the

next place, carefully ascertained whether their lines had become firmly attached to any object or not, by pulling at them with the first pair of legs; and if the result was satisfactory, after tightening them sufficiently they made them fast to the twig; then discharging from their spinners, which they applied to the spot where they stood, a little more of their liquid gum, and committing themselves to these bridges of their own constructing, they passed over them in safety, drawing a second line after them as a security in case the first gave way, and so effected their escape.

Such was invariably the result when the spiders were placed where the air was liable to be sensibly agitated: I resolved therefore to put a bell-glass over them; and in this situation they remained seventeen days, evidently unable to produce a single line by which they could quit the branch they occupied without encountering the water at its base; though on the removal of the glass they regained their liberty with as much celerity as in the instances already recorded.

This experiment, which from a want of due precaution in its management has misled so many distinguished naturalists, I have tried with several of the geometric spiders, and always with the same success. Placed under the bell-glass, or in any close vessel, they in vain endeavoured to make their escape from the branch to which they were confined; but in the disturbed air of an inhabited room they readily accomplished their object.

Instances of long-sustained abstinence from food by insects of the genus *Aranea*, unaccompanied by any manifest diminution of vital energy, have been given by various observers. In adding another case to the list it is proper to remark, that it must be received solely on my own authority.

Some of the spiders which produce gossamer were procured on

on the 2nd of October, and inclosed in glass phials with ground stoppers, where they were suffered to remain till the 16th of December, an interval of seventy-five days, without either food or moisture; yet at the expiration of that period, the only alterations perceptible in their external condition were a small decrease in bulk, and a slightly wrinkled appearance, particularly of the abdomen: but their functions were seemingly unimpaired; for on warm days, or when excited by artificial heat, they were lively in their motions, and to the last continued to produce their threads, which were often destroyed for the purpose of ascertaining whether they would be replaced by others with apparently the same facility as at the time of their capture.

It is particularly deserving of notice, that these insects, though unable to climb up the smooth perpendicular sides of the phials on their first introduction, soon contrived to traverse the interior of their prisons in every direction.

In order to illustrate their manner of proceeding on this occasion, the case of an individual has been selected for description,—the same method, with a few trivial modifications, being pursued by all. Elevating the abdomen, and pressing the spinning-apparatus against the side of the phial, this spider emitted from its papillæ a little viscous fluid, which on exposure to the air hardened into a minute semi-transparent speck; then moving to a short distance, and drawing out a thread after it, one end of which remained fixed to the spot it had just quitted, it connected this filament with another part of the phial by applying the spinners as before. Several lines being thus produced, the spider speedily raising itself upon them above the bottom of the phial, promoted its undertaking by repeating the process just described; every step so gained enabling it to carry its operations still higher.

From the cylindrical figure of the phial, it follows that all the lines attached to its sides by their extremities, such as were vertical alone excepted, formed with those sides chords to arcs of various magnitudes. Lowering itself from one of these chords to another, and applying the spinners to each in succession, the spider soon connected the whole of them together by a line; then ascending again to the greatest altitude it could attain, and dropping down by a thread to the bottom of the phial, over which it walked to the opposite side; it there drew the thread tight and made it fast, having prevented it from coming in contact with the glass previously by raising the abdomen a little. To this oblique line it united others, extending them in different directions, till by these means it established a communication with every part of the phial. As there was some difficulty in tracing these operations with the unassisted eye, lenses of the magnifying powers of six and eight were employed.

The spiders seen ascending into the atmosphere on the 1st of October were of two distinct species; but as the technical difference of insects has engaged only a small share of my attention, I shall leave the task of identifying them to those who are more familiar than myself with this branch of entomology. The subjoined remarks on some of the characteristics of these insects, which are more conveniently illustrated by the pen than the pencil, may serve to facilitate this object.

One species has four of its eight eyes much larger than the other four. Two pair situated in the front or fore-part of the head are arranged thus •..• , the relative size of the dots being nearly the same as that of the eyes. The other pair of small ones is placed in the upper part of the head, and on each side of it one of the remaining pair of large eyes is seated. This spider has the abdomen rather depressed; the anterior limbs, which it raises in a menacing manner when any thing approaches it, are

longer

longer than the posterior ones; and it moves in a lateral direction with almost as much ease and expedition as it does straight forward. The largest individuals of this species observed to be conveyed through the atmosphere by a current of air acting upon their lines, measured $\frac{1}{6}$th of an inch between the extreme points of the head and abdomen; $\frac{1}{10}$th of an inch across the broadest part of the abdomen; and weighed about a quarter of a grain.

The second species has also four eyes of a greater magnitude than the other four. The arrangement and relative size of three pair placed in the fore-part of the head may be thus expressed by dots :..: ; one of the other pair of large eyes being situated on each side of the head. Spiders of this species have the last pair of legs longer than the first, and move with great celerity, but rarely in a lateral direction. They vary considerably in colour, some being of a much darker hue than others, and these are frequently without the pale longitudinal line which extends the whole length of the thorax, and sometimes even on to the abdomen of the lighter-coloured specimens. The largest individuals seen floating in the air were somewhat inferior in weight and dimensions to the largest of the preceding species observed under similar circumstances*.

* Is this the *Aranea dorsalis* of the *Systema Naturæ*, Gmelin's edit.?

XXI. *De-*

XXI. *Descriptions of two Quadrupeds inhabiting the South of Africa, about the Cape of Good Hope. By Andrew Smith, M.D., Member of the Wernerian Society of Edinburgh, Superintendent of the South African Museum, and Assistant Surgeon to the Forces. Communicated by Sir Everard Home, Bart., V.P.R.S., F.L.S., &c.*

Read June 19, 1827.

Most of the larger quadrupeds of South Africa are now known by names, yet few, comparatively speaking, by perfect descriptions. That such should be the case is not at all to be wondered at, when we consider that almost all the knowledge we possess regarding them has been obtained either from dried skins or from the works of travellers,—a class of individuals usually but little versed in natural history, and whose temporary residence, even if better informed, affords but few opportunities for making such experiments and observations as are absolutely necessary to advance science.

To describe animals with accuracy, they must be studied when alive, examined when young, observed when old, and closely watched through every stage between those periods; and to do that requires long and actual residence in the spots where they occur: circumstances which point out the propriety of local institutions for such purposes in all places whose natural productions are not thoroughly known. If such a plan had long ago been pursued at the Cape, doubtless the two animals now about

to

to be described would ere this have been familiar to naturalists, and the illustrious Cuvier saved the necessity of making the following confession regarding one of them*. "Nous avons au cabinet du roi une hyène dont la patrie est inconnue, sur laquelle je suis en doute si c'est encore une varieté de l'hyène rayée ou bien si on doit la regarder comme une espèce distinct."

Two species of the genus Hyæna inhabit the more southern parts of Africa, viz. the *Hyæna encrita*, or Tiger Wolf of the Cape colonists, and the Strand Wolf of the same, or the animal evidently alluded to by Cuvier in the remarks above quoted. The description of the latter has been drawn up from observations made on several different specimens, but particularly on one which was purchased for the South African Museum, when very young, and which now full-grown still continues in the possession of that establishment.

The other animal, as will be seen, is a new species of *Hyrax*, which, though it has lately been sent to Europe, has not yet, as far as I know, been named or described. From its being always found living in cavities or hollows of old decayed trees, I have given it the specific appellation of "*arboreus*." The drawing of the Hyæna accompanying this paper, is a close and faithful representation of the animal; and it was my wish to have sent one also of the *Hyrax*, but in that I have been disappointed, in consequence of my specimen dying before the drawing could be made.

HYÆNA VILLOSA.

Hyæna with the body dusky-gray variegated by large black spots or oblique bands, with the neck yellowish, and the extremities marked by interrupted transverse black lines.

* *Récherches sur les Ossemens Fossiles*, par M. Cuvier, tom. iv. p. 384.

STRAND

STRAND WOLF, STRAND JUT, of the Colonists.

TAB. XIX.

In point of size and strength this species falls considerably short of the *Crocuta* or most common Cape Hyæna. It usually measures about three feet from the forehead to the root of the tail, or a little better than four from the nose to the tip of the tail. The fore legs are considerably longer than the hinder ones; and when perfectly straight and upright, they maintain the upper parts of the shoulders about two feet four inches from the ground: on such, as well as on most other occasions, the head is still higher; and from thence till near the root of the tail the upper surface of the animal exhibits distinctly an inclined plane. The fore parts are much stronger and more robustly formed than the hinder ones, and its principal strength lies in the shoulders, neck, and head: the latter is throughout strongly constructed, and the upper part is very broad, and appears even more so than it actually is, on account of the manner in which the hair, like a ruff, stands out upon its sides between the ears and the throat. The forehead is deep, slightly convex, and covered thickly with a rigid short hair, partly black, partly white, and partly reddish-brown,—all, however, so intermixed with each other as to exhibit a sort of grizzled appearance. The lower portion of the face, commencing at the eyes, is much narrower than the upper parts, convex, in front flattish, at the sides and throughout thinly covered by short, black, and reddish-white hair. Immediately under the outer angle of each eye are one or two black spots and black hair, more or less distinctly in the form of one or more vertical stripes, occurs amongst the reddish-white sort that forms the ruff-like appearance previously alluded to as extending between the ears and the throat. The nose and the centre of the face immediately adjoining it are

Trans. Linn. Soc. Vol. XV. Tab. 19. p. 461

W. Taylor, sculpt.

Hyæna villosa.

are black and bare, the latter smooth, the former slightly rough and granular. The eyes are rather large, the irides very dark brown, and the pupils vertical, sometimes linear, sometimes oval. The ears are about four inches apart, pointed, usually erect, moderately long, and covered outside with a little fine reddish-white down, inside with the same, and the *meatus auditorius extimus* partially crossed by a tuft of white hair, which descends from the inside of the superior margin of the external ear.

The chin and sides of the under lip are blackish; the beginning of the throat a deep black; and these two hues are separated from each other, more or less completely, by a transverse oblique band or white blotch. On the forehead, immediately over the inner angle of each eye, are a few particularly long black hairs, and some similar ones are observed about two inches behind the organs just mentioned, only, however, rather a little below their level. The latter issue from a thimble-like cavity formed by the shorter hairs receding from each other, and another and a similar appearance, nay even if any thing more distinct, occurs about an inch behind the corner of the mouth, from which also protrudes a small number of like black stiff hairs. The whiskers are long, very strong, black, and disposed in three or four rows on the sides of the upper lip a little behind the nostrils. The hair on the neck and body is very long and shaggy, measuring in many places, but particularly about the sides and back, at least six inches. On the lateral parts of the neck, from the temples to the anterior edge of the shoulders, the whole is of a dirty tawny-white or dirty-yellow, which, with a little more white, is nearly the colour of the breast, belly, and insides of the extremities. Along the upper part of the neck, commencing at the forehead, the hairs are rather longer than on the sides, and of a tawny-white colour, slightly varied, however, by a

partial intermixture of a black or blackish-brown sort. A dirty tawny-white, or rather tawny-gray, occurs also on the back and sides, but is in those places less distinctly observed in consequence of the number of large irregular blackish spots, or transverse oblique stripes, which in some specimens are of so great a size and so closely set that their colour may be considered as the ground one, and the lighter hues only as variegations. The root of the tail is a dirty tawny, and the tip, or indeed the greater part of its length, bushy and black, with a slight intermixture of white hairs, and the whole measuring about eight inches in length. Outsides of the legs dirty-white crossed by a number of narrow nearly straight deep black bands, which are regularly wanting on the insides. Feet dirty-white and without variegations, each with four toes, and each toe with a short strong claw.

From an early age, the great length of the hair formed a very striking feature in the appearance of the captive specimen; yet I nevertheless felt inclined to view it as an example of the common striped species, and was disposed to attribute for a time the length of the covering to the circumstance of the animal's confinement. Recent examinations, however, of several others of a similar description, all of which had passed their early, and some of their mature, years in a state of nature, have proved, that the peculiarity alluded to did not depend upon the change of situation, but was common to it under all circumstances, and therefore with other characters has led me to regard it as a distinct species*.

In its manners, habits, and disposition, it agrees with the spotted sort; but from an inferiority of physical powers it is a

* I have no means of ascertaining the *H. fusca* of Geoffroy St. Hilaire: at any rate the description of that species does not correspond with ours.

less

less formidable enemy to man. Though equally carnivorous with the *Crocuta*, it seldom attacks the larger quadrupeds, and it is only sheep, goats, and such-like animals that suffer from its predatory habits. A living specimen, which I kept a long time in my possession, appeared particularly inclined to indolence during the day, and submitted to confinement even from the first without apparent regret, till the gloom of night approached, when he generally became restless, active, and evidently anxious after liberty. Every change that was made in his situation was followed during a certain number of succeeding nights by fresh exertions; but as soon as he found an escape to be unattainable he quietly submitted to his fate. When he was first procured, he was chained to a wooden post in the open air, and a large box was placed near him to afford a shelter from the inclemencies of the weather; but this he soon broke to pieces. He was then moved into an outhouse, and there kept chained till the collar began to chafe his neck, when it was cut off, the door closed, and he left so far free.

Though he could, while thus secured, range over every part of the house, yet he never attempted to effect his escape from the building till he found himself disencumbered of his chain, when he commenced the very first night afterwards digging up the floor close to the edge of the wall; and so industrious was he, that ere morning he had formed a cavity in which he could almost conceal himself. The hole was immediately filled up by large stones, all of which, however, he removed during the next night, and went on digging till he reached the foundation of the wall. This from its strength and breadth put a stop to his further progress. Having on this occasion also been disappointed, he relinquished his exertions, appeared perfectly contented with his residence, and showed no inclination whatever to commence operations in any other part of his dwelling. He always evinced

a great anxiety to carry things of every description to the place where he was confined; and whatever he got he invariably showed much inclination to retain, as even the most trifling articles were not without difficulty regained. He always seemed much delighted at the occurrence of rain, and during its continuance kept leaping and running about with unusual activity. Great warmth appeared always to be disagreeable to him; and whenever the heat of the sun was powerful, he regularly, if possible, got into the shade. On various occasions he appeared playful and mild, which, however, there was reason to believe, arose more from cunning than from good-nature; and on one of these occasions he continued his familiarity till he got his playmate, a young dog, within his grasp, after which he proceeded instantly to devour him. He appeared always extremely suspicious, and as if in constant fear of snares; for on one or two occasions I placed a common deal board obliquely across the house in which he was confined, and it was not till a considerable time after he had become accustomed to it that he ventured out of the distant corner into which at such times he regularly retreated. On gaining sufficient confidence to enable him to leave his retreat, he invariably advanced with much caution towards the board; and it was not till after a considerable lapse of time that he even dared to bring his nose in contact with it. In doing this, he frequently and suddenly retreated without any evident reason, and often merely from flies which he disturbed by advancing his head. After having on such occasions cautiously smelt the object which caused his fears, he never even then appeared satisfied with his situation till he had licked it all over with his tongue, and tried the influence of his teeth upon such parts as they could be brought to touch.

He appeared now and then fond of exercise; and at such periods he would run a hundred times, or even more, from one

extremity

extremity of his habitation to the other without resting*. He always appeared to relish meat in which the blood remained, more than that from which it had escaped; and he invariably betrayed a great anxiety to destroy whatever animals came near him. On occasions when he succeeded in effecting this, he regularly lay down upon his victim and rolled over and over it, after which he carefully licked up such blood as might be upon it, or upon the ground on which it lay.

After a continuance of such gambols for about half or three-quarters of an hour, he usually proceeded to consume his prey; and then, as well as at other times, when he had more than he could at once devour, he generally concealed it in some hole or corner, and there let it remain till hunger urged him to make another meal. He always evinced a great liking to bones, and often would seize upon them in preference to flesh, and employ his teeth for hours together in breaking them in pieces, and his tongue in collecting the marrow and soft parts from the fractured portions. Such employment he appeared to pursue partly as a pastime and partly as a means of gratifying his palate, which the species under consideration, as well as the *Crocuta*, is known to practise in his wild retreat, or place of concealment.

While one day employed in secretly observing the habits of this animal, I noticed an upright beam, which stood in one corner of the building in which he was confined, besmeared towards its middle with a dirty white-looking matter resembling impure candle-grease. On continuing to survey it, I saw the Hyæna approach the spot and lick off a portion with his tongue, which proceeding he repeated several times in close succession, till almost all of it had disappeared. Leaving him when scarcely

* I have often observed hawks, when in a state of confinement, do the same, which was probably to make up for the want of their natural exercise, so requisite for proper digestion.

any

any of this grease was to be seen, I was not a little surprised on my return to find the quantity much increased, and therefore determined if possible to ascertain from whence it was acquired. With this view I had the post cleaned, and then concealed myself so as to be unnoticed by the animal, and yet be able to see him. Scarcely was quietness established, when he approached the old spot and commenced rubbing his *nates* forcibly against the wood for about half a minute, and upon desisting an abundant supply of the white greasy-looking substance was found to have been deposited, which he commenced consuming agreeably to the mode already described. The rubbing-place was cleaned several times, and as regularly as that was done, the loss was supplied, till at last the animal finding all his exertions of no avail, selected a large stone in a distant corner of the building upon which to form the deposit, and where he continued to place it as long as he was annoyed. Since I first observed this habit, which is now more than six months, I have never for many minutes together seen the beam without more or less of the substance in question; and whenever I have secretly watched the animal for any time, I have seen him licking off and swallowing portions of it. He seldom finished a meal without betaking himself to the beam; he almost never rose from rest without making a similar journey, and he rarely at any time passed the deposit without partaking of it. Is this secretion necessary for carrying on the process of digestion, or for maintaining the regularity of the functions of the alimentary canal?

HYRAX ARBOREUS.

Hyrax, with the colour a mixture of reddish-brown and black above; white beneath; a white blotch near the middle of the back.

BOOM-

Boom-Das of the Colonists.

This species rather exceeds the size of the *Hyrax Capensis*, usually measuring about 21 inches from the tip of the nose to the extremity of the back, and about 7 inches in height. In its general form it resembles the species just named; and in the manner of moving and sitting they exactly coincide. The colour above is a sort of tawny-red, freely mottled and variegated with black; on the lower parts of the sides it is reddish-white, with a less abundant intermixture of black; and beneath, as well as on the insides of the legs, it is an uniform dull white. The reddish colour arises from the tips of most of the hairs being of that hue; and the black variegations depend partly upon a scanty intermixture of long hairs, which are entirely of that colour, but principally upon an exposure of the deeper parts of the general covering, which are throughout inclined to black; and in consequence of this last being the chief source from whence the mottled appearances are derived, that necessarily is more or less considerable according to the position of the hair, &c. The crown of the head has a predominance of black; the sides and middle of the face anterior to the eyes are covered by a sort of short, dull, dusky, or reddish-white hair; and a whitish streak extends backwards from thence over each eye. The sides of the head a mixture of grayish-white and black, the upper and lower lips whitish, as is also the point of the chin, the throat, and the other under parts, as already mentioned. The ears are short and roundish, with their tips projecting but little beyond the hair with which the animal is covered; outside they are beset with long dusty whitish hair, and inside they have a mere scanty coating of the same colour. Directly in the middle of the back, about half-way between the shoulders and rump, is a narrow longitudinal whitish blotch, and about the centre of the chin is a trans-

a transverse darkish band. The tail is wanting; the feet and toes are covered above by a dirty reddish-white hair; the whiskers are long, black, and situated on the anterior parts of the upper lip, and some similar looking hairs occur immediately over each eye.

The teeth in this species differ a little from those in the other Cape Hyrax, more particularly the incisors; but as I have not had an opportunity of examining them minutely, I may only mention at present, that the upper ones are more pointed, and that the lower ones stand in pairs, from the two intermediate ones being separated by a considerable interval. The latter are also a little shorter than the lateral ones, and all of them have their tips tri-dentated.

This animal is found in many of the forests of South Africa, and is occasionally seen coming out of holes in decayed trees, or standing upon the summits of such as have only trunks remaining.

Little is yet known of its manners; and almost the only observation that can be elicited from the farmers and inhabitants of the parts of the country in which it resides, is, that it makes a great noise previous to the fall of rain.

XXII. *An*

XXII. *An Account of a Pair of hinder Hands of an Orang Otang, deposited in the Collection of the Trinity-House, Hull. By John Harwood, M.D., F.R.S. and L.S. Communicated by the Zoological Club of the Linnean Society.*

Read June 19, 1827.

In viewing the collection belonging to the Trinity-House, Hull, being no less interested than surprised by the extraordinary size and appearance of a pair of the hinder hands of an Orang Otang contained in a glass vessel, I became anxious to obtain all the information possible concerning them; and I have now the pleasure of laying it before the Linnean Society.—On the 5th of June 1822, Captain John Anderson, (since deceased,) master of the ship Lord Wellington, of Hull, presented to the Board (to use the words contained in his letter to them) "two of the feet of an Orang Otang, which had been presented to him in the year 1821 by the native Sultan of Pontianna in Borneo, in whose family they had remained as a great curiosity during 154 years. This chief," he continues, "is remarkably fond of the English nation; and added, in presenting them to me, that the apparent strength of the feet of this animal would indicate the power of his attachment to them and their interests." Such, then, is the only portion of history I have been enabled, or am likely, to collect concerning these specimens. In confirmation of the above account, on visiting the residence of the late

Captain Anderson, to obtain further information on the subject, a great many other curiosities were shown to me, for which he had been indebted to the munificence of the same chief.—It now then becomes necessary to point out more especially what I conceive to be the peculiar claims of these specimens to our attention.

Though very materially shrunk in bulk, from a styptic solution in which they have been preserved, they are, in the first place, even at present, larger than any similar specimens of which I have seen any well-authenticated description: for while Dr. Abel in his highly interesting account of the gigantic Orang Otang, killed at Ramboom in Sumatra, which he computes to have measured 7 feet 6 inches in height, states it to have had hinder hands which measured 14 inches in length,—these specimens extend no less than 15 inches and a quarter. Notwithstanding considerable contraction in their circumference over the knuckles, they still exceed the admeasurement of his more recent specimens by a quarter of an inch, being 10 inches, while the middle toe of ours, from the knuckle, exceeds his by an inch and three-quarters, being the enormous length of 7 inches and three-quarters. The length from the metatarsal bone of the fore-finger to the end of the thumb, which is placed at nearly right angles to it, is 5 inches and a half; and from the outer edge of the metatarsus to the end of the thumb, 9 inches. The circumference of the thumb at its extremity is no less than 3 inches and a quarter, and that of the tarsus 11 inches.

The second circumstance worthy of notice is the fact that the thumbs are each destitute of a nail, but they have a hardened protuberance in its place: and thirdly, their upper surface is covered more or less thickly, as far as the last joint of the fingers, with red ferruginous-coloured hair, which about the ankle is several inches in length. The coarse and thick cuticle

which

which covers the palms and the inside of the fingers is strongly furrowed by those parallel and spiral lines, which in our own hands, those of the apes generally, and in many of the *Plantigrada*, announce the acuteness of the sense of touch. The skin is of a reddish-brown colour; and the nails, which are about an inch in length, are darker. The thumb, as in all these creatures, is comparatively short, but extremely powerful; and, as before observed, placed nearly at right angles with the metatarsal bones.

These gigantic specimens having thus all the characters which pertain to the hinder hands of the true *Simia Satyrus* of Linnæus, or the Red Orang Otang of the Eastern Islands, of which very young individuals have occasionally been brought to Europe, it becomes a question, whether we are to refer them to that species; whether we should regard them as belonging to a species very similar, yet distinct from that animal, as the Pongo, described by Worms, has been thought to be; or whether we should consider these two animals, the *Simia Satyrus* and the Pongo, to be the same species of different ages, as they have been supposed to be by Cuvier, Desmarest, and others, who regard the Pongo as the adult animal. Now, certain it is that they very closely resemble each other in many of their characters; and I should be strongly inclined to acquiesce in this latter supposition of their identity, could difficulties be overcome which have arisen from an examination of several skeletons of Orang Otangs, for opportunities of doing which, I am especially indebted to Mr. Clift and Mr. Brookes.

Among these difficulties, the most important arises from a difference in the number of the vertebræ; for in the perfect skeleton of the Pongo at the Royal College of Surgeons, I find five lumbar vertebræ instead of four, which latter is the number in all the specimens of *S. Satyrus* that have fallen under my

observation. There is a considerable difference in the clavicles: in the Pongo they are much straighter and of a different form, as was particularly observable in a specimen belonging to that kind and munificent promoter of natural science, the late Sir Stamford Raffles. The scapulæ of the Pongo have their spine strongly incurvated upwards, while in the *Simia Satyrus* it pursues almost a straight direction horizontally: the space also for the attachment of the *infrà spinatus* muscle is, relatively to the size of the bone, far more extended in the Pongo. In regard to the form of the skull, there are differences between these animals so decided as particularly to claim our attention, especially as I am not aware that they have been before noticed. The nasal bones in both animals are perfectly flat and do not at all project forwards, and are ossified together at a very early age; but the antrum is a cavity of far greater dimensions and developement in the *Satyrus* than in the Pongo, where it can be hardly said to exist at all,—a circumstance which, supposing the latter to be the adult *Satyrus*, is the reverse of what takes place in other animals. But the most distinguishing difference relates to the proportions of the orbits, and the space which separates them. They are of by far the greatest proportionate size in the *Satyrus;* for in the very young animal before alluded to, they measure transversely 15 lines and a half, while in the skull of the largest Pongo ever brought to this country, they extend no more than 17 lines and a half. But the difference in the extent of the space between the orbits is of all the distinctions I have seen the most apparent; for in the *Satyrus*, where the transverse extent of the orbits is 15 lines and a half, and the vertical 17 and a half, the space between the orbits is only 2 lines and a half; and in the still younger *Satyrus* at the Royal Institution, where the transverse diameter is 13 lines and a half, this space measures only 2 lines, or less than one-sixth; while in the Pongo, where the same

same diameter is 17 lines and a half, it is no less than 7 lines and a half, or nearly equal to *one-half the breadth of the orbit*. Neither is the orbit itself in these animals placed on the same plane; but while almost vertical in the *Satyrus*, it forms in the Pongo an angle with the horizon of many degrees less. These then appear to be some of the most important distinctions. In their absence, indeed, the many others which exist in the form of the skull of these animals might be attributable to age; for although those of the *Satyrus* seen in Europe have the skull round and smooth, and the facial angle large (as is so well exemplified in the skeletons at the Royal Institution, Mr. Brookes's, and at the College of Surgeons), while in the Pongo the skull is angular, provided with sharp ridges or crests, and the facial angle much smaller, such differences, though less apparent, are seen between the young and old of most other quadrupeds.

In addition to other arguments mentioned in favour of the identity of the two animals, the French naturalists assert that the vertebræ of each kind are the same in number. This conclusion they seem to draw from the large skeleton of the Pongo in the collection of Comparative Anatomy at Paris, but which, being obviously imperfect in several of its parts, I am much inclined to consider is deficient in one of its lumbar vertebræ. They then state all the proportions of the body and limbs to be similar, each to be destitute of the hinder thumb-nail; each to have large cavities communicating with the larynx, and of the same form; neither to possess callosities; and that the colour differs only in being darker in the Pongo, as we see it in most adult animals. We also know that they inhabit the same country. To these arguments I may with justice add, that the adult *Simia Satyrus*, as distinct from the Pongo, has never been accurately described; and that the *Simia Satyrus* seen here is evidently the young of a large species, as is determined by the loose

loose and porous texture of its bones, and the cartilaginous nature of their extremities.

I cannot suffer the present opportunity to pass by, without suggesting the possibility of Dr. Abel having been materially deceived in his estimate, taken from the dried skin, of the height of his animal, which he computes at no less than 7 feet 6 inches; for he calculates, that the extent of his reach from finger to finger across the chest did not exceed 8 feet 2 inches; whereas in the skeleton of the Pongo at the College of Surgeons, whose arms I believe to be shorter in proportion to its height than in the true *Satyrus*, and which is probably the same species he has described, —in this Pongo I find the extent of reach to be not less than 7 feet, and yet its height does not exceed 3 feet 11 inches: and consequently, if what I have presumed be found correct, were it a *Satyrus* instead of a Pongo, with a reach of 7 feet, its height would scarcely exceed 3 feet and a half. It is highly worthy of notice, as relating to the proportions of Orang Otangs, that with a reach of 7 feet, each arm being 3 feet 1 inch in length, this Pongo measures only 2 feet 2 inches from the summit of the head to the extremity of the *os coccygis*, and only 1 foot 10 inches in the length of its hinder extremities, or from the top of the head of the *os femoris* to the under surface of the *os calcis*. The hinder hand of this creature is at the same time no more than 2 inches shorter than that of the animal described by Dr. Abel, being 12 inches in length.

From the capacity and form of the pelvis, and other circumstances, I have reason to believe the skeleton at the College of Surgeons to be that of a female, while there is as strong evidence that Cuvier's larger skeleton of the same species is that of a male. Having been favoured with accurate admeasurements made of the Parisian specimen by Mr. Clift, it may not be considered irrelevant to our subject to compare some of its proportions with those

of

of the former. It exceeds ours in height by 6 inches, having an altitude of 4 feet 5 inches instead of 3 feet 11: yet, as its arms each measure 39 inches and a half, instead of 37 inches, and as its chest is broader, its relative height to that of its reach I find to be precisely the same,—the latter being a little under 8 feet. In its length from the summit of its head to the extremity of the *os coccygis*, it is exactly the same as ours, being 2 feet 2 inches; and the length of its hinder hands is precisely similar, being 12 inches. Its bones are however thicker and stronger in proportion, the head of the humerus measuring 6 inches and one-eighth in circumference, and that of the chest at the lower part of the sternum no less than 37 inches.

In regard to the relative length of the arms in the Pongo and the *Satyrus*, it stands thus. In the *Satyrus*, when young, the fingers may be observed literally to drag upon the ground like those of the Gibbons, though the creature be placed erect; while in the Pongo the fingers scarcely reach to the external maleolus. Slight differences of this kind undoubtedly take place during the growth of animals; yet those who suppose the Pongo to be the adult animal, must be prepared to contend for a much greater change in the relative proportions of parts during growth than can be admitted in other cases. Having mentioned the erect position, it is almost unnecessary to add, that it is altogether unnatural to these creatures; and that although we see their skeletons constantly distorted into human attitudes, one grand characteristic between them and us is the impossibility of their thigh-bone being brought, by fair means or by the action of their own muscles, into the same line as that of the spine. In all inferior creatures, it is observed to form with it an angle of greater or less magnitude, which is the most convincing of all proofs, that their hinder extremities alone were never destined for the support of their bodies.

From

From the evidence which has been thus briefly adduced, I shall in concluding only further observe, that I consider the differences mentioned fully sufficient to disprove the identity of the *Simia Satyrus* with the Pongo, though they are at the same time very closely allied to each other. The specimens of the hands which I have taken the liberty of bringing under your notice, may most probably have belonged to the former animal, in which case they afford a very imposing example of his vast physical powers, when allowed to attain mature age in the shady recesses of his native forests.

XXIII. *Ex-*

XXIII. *On Systems and Methods in Natural History.* By *J. E. Bicheno, Esq., F.R.S., Sec. L.S.*

Read June 4, 1826.

I PROPOSE to myself on the present occasion to make some observations on Systems and Methods in Natural History; a subject of great importance at all times, but more especially so at present, when new views of arrangement and nomenclature are proposed, and to some extent adopted. Let me not be understood, however, in the general observations which follow, to be opposed to any particular system; my object being to discuss the first principles of arrangement, and to leave others to judge how far they are applicable to the views adopted by any individual systematist.

It has appeared to me that the difficulties of the subject have not been duly appreciated; and the time cannot be unprofitably occupied, if I accomplish no more than to enable us to estimate them. It might even be suspected, from the readiness with which new systems are adopted, that they have a peculiar attraction for ardent minds; as it has not unfrequently happened that young naturalists have found themselves prematurely embarrassed in a subject, which of all others requires not only an extensive acquaintance with the operations of the human mind, but long experience and various practice. The line of argument I propose to employ, must necessarily be somewhat abstract; yet I hope I shall be borne with, since the practical naturalist could

make no accumulations to his science, and all his particulars would stand unconnected and discrepant throughout, without the aid of abstract reasoning. Besides, I am anxious to engage the attention of persons accustomed to turn their observations to the operations of the human mind, and to the instruments which it employs to perform its labours; feeling assured that, by obtaining the cooperation of this class of philosophers, we shall have great light thrown upon our subject; and that it will be one means of attracting the notice of those who delight in a large and liberal treatment of science. While they impart to us a philosophical solidity, in which I am apprehensive we are wanting, we may hope to communicate to them a reciprocal benefit, in some of those graces and charms to be derived from the study of Nature, and in which perhaps they may be deficient.

Without undervaluing the study of species, upon which a great deal of our knowledge is built, it cannot be denied that naturalists in general have been too often content with assigning them names, and a place in the systems they have adopted; and this they have done without having an ulterior view to their structure and functions, and the relations subsisting amongst them. Much less have they kept in view the end of generalizing the particulars they are accumulating; but they continue to heap together a "*rudis indigestaque moles*," until they are actually overwhelmed by their materials. To build up science skilfully, the combination should go on with the collecting, or the superstructure will exhibit neither use nor beauty.

Mr. Roscoe has clearly illustrated the comparative merits of the artificial and natural arrangements in Botany in a former volume of the Transactions*; and has satisfactorily proved, in my estimation, that however admirable and comprehensive the system of Jussieu may be, yet it ought not to supersede the

* *Trans. Linn. Soc.* vol. xi. p. 50.

use

use of the Linnæan arrangement. The two great masters of botanical science propose different ends, and ought not to be regarded as rivals. The President of this Society has also constantly pressed upon the attention of the student the same important fact.

In some respects it is not to be regretted that the absolute sway which the name of Linnæus has had among English naturalists is somewhat abated: for although authority is an extremely useful bond of union, and has in this instance established among us a nomenclature which nothing short of homage to the founder could probably have made current, yet it has brought with it the ordinary evils attendant upon great names. The range of the pupil has been limited by that of the master; and it has been considered a species of heterodoxy to dissent from the established opinions. The danger to be now apprehended is, that those who adopt other arrangements will forget the advantages to be derived from what is old, in their love of that which is new.

In addition to the remarks made by Mr. Roscoe and the President, I would beg leave to suggest to those who adopt new systems,—and in adopting them think it advisable to break up the old orders and genera into many new ones,—that the artificial and natural systems aim at two very distinct objects, which are in some measure incompatible with each other. The one is to make us acquainted with individuals: and the other, founded upon an acquaintance with individuals, to combine them according to their characters, so as to abridge the labour of reasoning, and to enable us to ascend from particular to general truths.

In order to assist us in these investigations, we employ certain words in a peculiar sense. Thus the word *Species*, when used by naturalists, has a more confined signification than the same word when employed in scholastic language. We have agreed that a species shall be that distinct form originally so created,

and producing by certain laws of generation others like itself: whereas all that logicians have meant, is a number of objects bearing a certain resemblance to one another, and on that account denominated by a single appellation, which may be employed to express any one of them. This term is the creature of art, to help us up the first step of generalization. By its assistance we propose to reason upon all the individuals conforming to the law we have laid down, as safely as we can do of any one of them. There is this inconvenience attending the use of it by naturalists, that it assumes as a fact, that which in the present state of science is in many cases a fit subject of inquiry; namely, that species, according to our definition, do exist throughout nature. It is too convenient a term to be dispensed with, even as an assumption; only care should be taken that we do not accept the abstract term for the fact.

It might, for instance, be proposed as a legitimate question, whether the species of some familiar genera, such as *Rosa*, *Rubus*, *Saxifraga*, do not run into one another by imperceptible shades, unappreciable by human sense, in the same manner as certain genera melt and intermingle their characters, so as to render it impossible to circumscribe them. Indeed, the extent to which species-making has been carried in modern times, almost leads to this conclusion. Visible and palpable distinctions are in many cases no longer relied on; and there are many acute naturalists, who, without bringing the subject to the test of experiment, are content to rely on those empirical characters, which can only be perceived by long and familiar experience, and cannot be described by words. The truth is, that all sensible objects have characters which leave impressions upon the mind, without our being capable of embodying them in language. We are all aware of this when we speak of tastes, and tints, and the countenances of our friends. Every-body perceives them, yet nobody

can

can communicate to his neighbour his perception of their differences. Thus botanists speak of certain species of plants differing in appearance, habit, touch, &c.; by which they often mean that they have some indescribable peculiarities about them, which point them out to the practised observer as distinct. A great number of such species may be detected in every modern Flora of a well investigated country; but whether they deserve to be ranked among those which are capable of definition, is a question of great doubt:—that the practice is an inconvenience, none will deny; and if it be much longer continued, will involve in inextricable difficulty all our well known species, make us dependent upon empirical and traditional evidence for our acquaintance with them, and render it impossible to derive instruction from books. In such cases the assumed law ought to be brought to the test of experiment, or the species should be rejected.

Many of our cultivated plants also tend to invalidate the law. Who can refer our *cerealia* and esculent vegetables, in many instances, to their true types? and how few of our old flowers are there, of which the astutest botanist can trace the origin! Domesticated animals afford a still more striking example; and man himself furnishes the most difficult problem of all.

These remarks and examples are, I apprehend, sufficient to show how difficult it is to adopt the term in its strict acceptation; and that however precisely the naturalist has attempted to employ it, he has not succeeded to the extent he has proposed; and that it can only be taken as correct in a vague and general sense, and as a convenient abstraction to relieve him at the first step from the necessity of becoming acquainted with every individual.

The next term of importance to the naturalist upon which the accuracy of his reasoning depends, is that division of his system which he denominates a *Genus*. This is an assemblage of individuals agreeing also in some common characters; but, unlike the

the word species, it is not previously defined. Thus much indeed has been thought requisite; that in botany these common characters should be taken from the parts of fructification, and in zoology from such parts as are indicative of structure and habits. "A genus should furnish a character, not a character form a genus." We are not here, as in the word species, precluded from inquiry by a previous definition. Though both words are terms of generalization, there is the same difference between them, as instruments of reasoning, as between a definition and a proposition in geometry.

The species includes all the characters which are in the genus, and those likewise which distinguish that species from others belonging to the same genus; and the more divisions we make, as order, family, class, it is intended that the names of the lower should become still the more comprehensive in their signification, but the less extensive in their application to individuals. Naturalists by this invention, which is not exclusively their own, have it in their power to contemplate and reason upon these separate characters, with all their consequences, as if they existed independently of species; as by the use of the word species they are enabled to look at their peculiar attributes independently of individuals. This faculty of the mind, which is one of the most curious that belongs to it, has given rise in all languages to a multitude of words of the same kind as the names of genera in Natural History; words, which do not express individual existences, but are abstractions of qualities and characters belonging to them*.

All general reasoning in morality, law, politics, and even mathematics, depends for its accuracy upon the proper use of ge-

* I would avoid here, and leave the question to be decided by the reader, after he has consulted Locke and Berkeley, whether we have got ideas corresponding to these abstract terms, or whether they are mere signs, like x, y, and z in algebra.

neric

neric and other abstract terms. In mathematics they admit of exact (or I would rather say more exact) previous definition; and hence arises the accuracy of deductions the most recondite and remote in that science. In the other sciences, which are of a speculative and contingent nature, these terms are employed not with the same precision, but seem to be the result of our necessities, borrowed from sensible objects and analogy, and frequently indeed from accidental coincidences. They derive their force rather from the character of the mind that employs them, than from any exact definition they may have received; and it seems impossible to make men use such words in a common acceptation. Hence it is, I apprehend, that knowledge of a speculative kind so soon finds its limits; and where at its outset it has promised such glorious results to mankind, as long as it floated in general propositions, the same subject eludes the grasp of the human faculties when it is attempted to be reduced to exactness, and leaves something always to be desired. We are constantly approximating to the truth, yet never reaching it.

It is sometimes asserted, but not correctly, that Natural History, by the aid of its terms, partakes of the nature of mathematical truth; or that it lies intermediate between that science and speculative knowledge. The situation of the naturalist is rather this. He finds himself placed amidst an infinite number of unknown particulars; and in order to facilitate an acquaintance with them, he at once, without regarding individuals with much minuteness, throws together a number of them, which he calls a species, according to an assumed hypothesis. These he attempts again to combine by certain external characters, and calls them a genus. By these means he is enabled to contemplate and treat of them, without being utterly bewildered in the labyrinth of unarranged individuals. Classification is his *filum Ariadneum*. It was but imperfectly understood by the ancients; and has

enabled

enabled the moderns to arrive at conclusions with much more expedition than they, and with equal safety. It does that at once which is constantly going on in ordinary language,—the modifications of it to express the classes of external objects. The invention of new terms suited to express new ideas in an abridged and compressed form, is a slow process, and in most cases is the result of convenience. There is no convention to attain the object, because nobody can arrest the subtile means that are employed. But the naturalist being without terms, or at most with so few that they are within his power, attempts to anticipate the slow process usually working in language, and forms at once his instruments of reasoning; and systems and methods can be regarded as no further useful, than as they are assimilated to the ordinary process of abridging the labour of thought adopted by mankind in other subjects of a like nature.

Naturalists err greatly who imagine they are employing terms possessing some new and distinct properties; whereas all they can do is to hold the subjects of natural history together in a loose manner by the use of the words *species*, *genus*, *order*, and *class*; thus presenting certain characters to the mind as separate objects of contemplation by means of abstract terms, of a similar though somewhat more precise import than those which are employed by the rest of mankind in treating general subjects. A stricter use may be made of these words by naturalists than by metaphysicians, because the business of the one is to examine characters and qualities more nicely than the subjects entertained by the other will admit of. Nevertheless, the one cannot employ these abstractions as instruments of reasoning in a different sense from the other. There is no magic about them in the hands of a naturalist more than there is in any of the thousand general terms in the mouths of the vulgar. "Rose" and "Grass" were generic names before the flood, and will continue to be so in spite of systems

systems and methods. The naturalist has attempted only to carry this necessary operation of the mind somewhat further and with more precision, and has thus exposed himself to errors, which the vulgar have escaped. Thus, although there are but two modes of reasoning; namely, by the use of words expressive of an individual and its attributes, or by general words indicative of an aggregation of individuals with their common attributes; yet naturalists have used their terms in a different sense, and have invented additional ones, such as *order*, *tribe*, *cohort*, *family*, *class*, by which they attempt to express with more accuracy larger generalizations than they would do by employing a generic term, and as if they could settle the relative rank of the different groups whose existence they have assumed. Whereas the truth is, that in many instances a class may be equivalent to an order or a genus. These different gradations, thus strictly aimed at, are gratuitous assumptions with which Nature has nothing to do; and which frequently lead to the establishment of false hypotheses.

It was the opinion of Linnæus, and continues to be the opinion of some of his disciples, that genera are actually founded in nature as much as species. "Naturæ opus semper est species et genus." *Phil. Bot.* § 162. "Genus omne est naturale, in primordio tale creatum, hinc pro lubitu et secundum cujuscunque theoriam non proterve discindendum aut conglutinandum." *Ib.* § 159. So the excellent and elegant author of the "Introduction to Physiological and Systematic Botany," says, "A genus comprehends one or more species so essentially different in formation, nature, and often many adventitious qualities from other plants, as to constitute a distinct family or kind no less permanent, and founded in the immutable laws of the creation, than the different species of such a genus. Thus in the animal kingdom a horse, ass, and zebra, form three species of a very distinct

distinct genus, marked not only by its general habit or aspect, its uses and qualities, but also by essential characters in its teeth, hoofs, and internal constitution.". It was the circumscribing these insulated assemblages of species that Linnæus regarded as the business of the accomplished naturalist.

Those therefore who use the word *genus* in the Linnæan sense, do not employ it with the same meaning as those who regard genera as merely conventional, and subject to be broken down to suit convenience. The latter would do well to employ some other term, else one great object will be lost at which we are aiming;—the keeping together under some one common head those small assemblages of species which in some instances are so obvious, and so important in enabling us to comprehend and discourse of the scheme of nature.

Whether such insulated groupings really exist, it is for the naturalist to determine, and this can be only inferred from a very extensive knowledge; but as long as we are witnesses to such striking modifications of form as we discover in the genus *Erica*, *Rosa*, *Eriocaulon*, &c., among plants, and in *Vespertilio*, *Strix*, *Scarabæus*, &c., among animals, it would be the height of folly to give up a term so expressive and at the same time so useful, or to transfer its received meaning to some other word which has not been used in the same sense.

As the success of the systematist depends so materially upon the proper use of these abstractions, I shall now proceed to show some distinctions which it is necessary to keep in view while we employ them. We aim, as I said before, at two distinct objects by the use of systems: we use the artificial for becoming acquainted with individuals, and the natural as the means of combining them, and enabling the student to comprehend and speak of the general truths relating to nature by a knowledge of a few particulars.

Division

Division and separation is the end of the artificial system;—to establish agreements is the end of the natural. In one case we reason *à priori;* in the other *à posteriori.* The one is a descending, the other an ascending series. Linnæus understood this distinction when he remarked, "Ordines naturales valent de naturâ plantarum; artificiales in diagnosi plantarum."—"Cavendo in imitando naturam filum Ariadneum amittamus." Nevertheless it has appeared to me that many modern naturalists have not adopted these truths; and that it is the prevalent error of the day to attempt to generalize where they ought to analyse; while their arrangements, called natural, are almost all of them framed with a view to distinguish. Let me not be supposed by these remarks to wish to exclude from the natural system every attempt at diagnosis; for it is obvious, that as the business of the naturalist is to study all the characters, he can no more neglect differences than he can agreements. I only wish to point out the two dissimilar objects we have in view, that they may not be confounded.

M. Decandolle, for instance, whose labours as a systematist are invaluable, seems to overlook this distinction. In his "Regni Vegetabilis Systema Naturale," he starts from things the least known, to reason on things best known. He begins his comprehensive work with a predicate of the stars; and, proceeding downwards to minerals, comes to plants. Here he employs a series of terms expressive of a natural gradation from the highest to the lowest group, attempting fresh combinations at every stage, and making a place for every thing. Thus he has *class, sub-class, cohort, order, tribe, genus, section, species.* The extraordinary number of these combinations diminishes their value as a work of natural arrangement. It is a difficulty of sufficient amount to establish a few well marked; and when they are so multiplied, it may be suspected that many of them are arbitrary and artificial.

This attempt at breaking down good orders and genera into many subordinate and loosely defined groups, and encumbering them with names, involves the subject in obscurity, and may well be questioned as contrary to his main design of presenting those comprehensive views which are afforded by a natural system.

Mr. Brown has adopted a different mode in his "*Prodromus*." He has attempted to combine no further than his knowledge would warrant, not even employing the terms class or order as the names of his groups. As his object is chiefly synthesis, he keeps his diagnostic characters apart, thus leaving the mind less embarrassed when it is in pursuit of analysis. It must be admitted indeed, that his work cannot be employed with any success by the inexperienced, or even by those who have occupied themselves only in searching for species; but to have made it subservient to this purpose, would have been to have rendered it less beautiful and complete as a work of synthesis. His aphorisms and remarks not being reduced to exact method, "are," as Lord Bacon expresses it, "still in their growth, increasing in bulk and substance."

Now wherever the object of the systematist is to enable his reader to discover species, it is necessary to define at every step; and where natural characters do not present themselves, we must adopt artificial ones. For this purpose large classes are formed, many of which are necessarily artificial. These again are broken up into orders, mostly of an artificial character; and thus the naturalist is led step by step from more comprehensive definitions to less, from class to order, from order to genus, and from genus to species. In this descending series it will be observed that the essential feature is the facility that is afforded for definition. Hence the Linnæan system of botany has succeeded so well, because its author selected chiefly as the ground of his arrangement the number and proportion of parts most obvious and least

least liable to vary. His classes and orders are avowedly so many assumptions, which practice has shown to be convenient; but when we come to genera, the artificial system falls in with the natural, as Linnæus framed their characters upon resemblances founded in nature.

Now in the natural system this machinery of terms cannot be employed in the same manner. It is an ascending series from the less to the greater predicate. From genera we proceed upwards to orders, and orders we combine into classes. We become more and more general in our characters, instead of more and more definite. Here indeed we ought not to sacrifice, as in the artificial scheme, to convenience; and break up well-defined genera and orders because they contain a large number of species. If we find a large genus, for instance, as *Erica*, agreeing in some well-marked characters of structure, form, station, and properties, it appears contrary to the end proposed by the natural system, to divide and subdivide the species into small groups, and to give each of these the same value as is now possessed by the whole. This is frittering away characters which are essential to the use of a genus, and destroying our power over it when we proceed to generalise. The value of generic terms consists essentially in the distinct conceptions we have of them; but if we go on to multiply them, as is at present the fashion, we render it as impossible to circumscribe them, as it is to parcel out the colours of the rainbow; and instead of making Natural History familiar and popular, it will require the compass of a man's life to master the terms we employ. If indeed the object be to analyse, division may be very convenient, because the inquirer may be otherwise bewildered in the multitude of particulars. It does not follow from hence that the student of the natural system may not avail himself of subordinate groups by whatever characters they may furnish; only the giving them equivalent names, and making them co-ordinate,

is destructive, as it appears to me, of his system as a means of general reasoning.

In no department of natural history are the inconveniences arising out of this confusion of analysis and synthesis more felt than in Entomology. The multitude of species included in this kingdom of nature is so great, that it requires the most skilful arrangement to enable the student to determine them: yet it is unquestionably the worst furnished with assistance in this way;—a defect which may be attributed chiefly, I apprehend, to the attempt which both we and our continental neighbours have made to combine the natural with the artificial system. We have aimed at analysis and synthesis at the same time. A comprehensive acquaintance with this infinitely varied tribe can alone enable us to synthesise with safety; and a long period must elapse before we can hope to embrace within our synthesis the whole of the insect world.

In the large views taken by means of the natural system, our business will for ever be the labour of separating what we shall know from that which is unknown. The profoundest knowledge will at last be but a fragment. Some groups of nature are so closely related, that they have been observed from time immemorial. "Whatsoever parteth the hoof and is cloven-footed, and cheweth the cud," comprehends a group of animals so obviously connected, that they must have received a generic appellation from the remotest period. As knowledge has increased, more and more families have been separated: still there is always a remainder of unknown things. Take any natural system, and see if this is not the case. Linnæus in his "Fragments of a Natural Method" professes only to separate from the mass those groups which he saw clearly. Again, his definition of vegetables indicates the same truth: "Vegetabilia comprehendunt Familias septem, *Fungos*, *Algas*, *Muscos*, *Filices*, *Gramina*, *Palmas*:" and then, to include the remainder, he adds, "et *Plantas*;"

Plantas ;" defining the last thus, " Plantæ dicuntur reliquæ, quæ priores intrare nequeunt familias." *Phil. Bot.* § 78. Take up Jussieu's "*Genera Plantarum ;*" and besides his " Plantæ incertæ sedis," see how he is obliged to dispose at the end of many orders his " Genera affinia," and " Genera nondum satis determinata." This is true inductive philosophy ; yet the same author may be suspected of departing from this mode of investigation when he attempts to edge in his remainder under artificial or sweeping characters, as he has done in *Eleagni* and *Junci*, and when, falling in with this modern innovation, he invents a multitude of new orders to embrace every known species of plant.

The mammiferous animals are arranged with more ease according to a natural system, in consequence of their number being comparatively small, and their forms strongly marked. Nevertheless the system of M. Cuvier, in the " *Règne Animal*," clearly shows the vain attempt of finding a place for every thing. Nothing can be more satisfactory and beautiful than many of his orders and divisions ; yet see how he is compelled to change his ground when he comes to the *Pachydermata*, and to huddle together species very remotely connected. His birds also exemplify the same fact, where his order *Passeres* is made to include all that his other orders will not hold. " Son caractère semble d'abord purement négatif, car il embrasse tous les oiseaux qui ne sont ni nageurs, ni échassiers, ni grimpeurs, ni rapaces, ni gallinacés." Thus it contains the Warblers, the Shrikes, the Goatsuckers, the Crows, the Creepers ; birds of the most dissimilar habits, and living upon the most dissimilar food. The Chough is separated widely from the *Corvi*, and *Anthus* from *Alauda*. Now this is what we might expect from the nature of the subject ; only it is desirable that the remainder of unknown things should be distinctly avowed, and not reduced to an exact place in the natural system. Jussieu's was the most philosophic mode,

mode, which was to place this residue at the end. Linnæus too was very correct when he pronounced his natural orders to be a "Fragment;" and those persons who imagine it to be necessary or advantageous to find a place for every thing, and to divide and split for the purpose of making such places, appear to lose sight of the chief object of the natural system, and to destroy its utility as an instrument of general reasoning.

The French writers in general are prone to combine in their systems the very distinct objects of individualizing and generalizing. They are for ever subdividing where the great aim should be to combine, and thus they detract from the utility of their arrangements for either purpose. It is they who have countenanced the use of *sub-classes*, *cohorts*, *tribes*, *stirpes*, *sub-genera*, and *sub-species*; and they also are the great contributors to the minute division of genera. Strictly speaking, in the natural system we should employ but few terms of the kind alluded to, and those of loose application. For instance, the word *sort* or *group* would as correctly express any natural assemblage of species, as *sub-class*, *race*, *tribe*, *cohort*, or *stirps*; for what do we know of the relative value of the groups attempted to be pointed out by these expressions? And how can we say they are not co-ordinate or commensurate with each other? The great division of cotyledonous plants may, for aught we know, be only equivalent to the order of Grasses; and a genus in some cases seems as distinct as any class, as *Parnassia* and *Linnæa* among plants, and the *Ornithorhynchus* and *Hippopotamus* among animals. Indeed in the recent work of M. Latreille, "*Familles Naturelles du Règne Animal*," he has arranged the monotrematous animals in a class by themselves, and has made two orders; in one case, consisting of a single species, the *Ornithorhynchus paradoxus*, and in the other, of two other species before considered as belonging to that genus. Thus it is, as M. Cuvier remarks, that these animals

mals set at naught all our classification by their osteology and mode of bringing forth.

The adoption of these numerous terms, intended to express fixed ideas, must be looked on with suspicion. The terms *species* and *genus* are too well established by custom, and are so clearly the result of convenience, and moreover conform so closely to the ordinary use of these words, that their utility cannot be questioned; but those numerous subdivisions current among our neighbours, and sensibly increasing among ourselves, may well be doubted as unphilosophical language. To each of them is attempted to be assigned a definite value beforehand, and an impracticable degree of precision; and we deceive ourselves by fancying that we can deal with these delicate and fleeting instruments of thought differently from the rest of the world. But are we to attempt to fetter nature by our systems and terms? "Books should follow sciences, not sciences books," says the immortal Bacon; yet the adoption of systems and technical expressions, which have received their definition beforehand, cannot be employed without the danger of perpetuating false hypotheses, and an apprehension on the part of the ignorant, that these inventions give us some power over nature not belonging to ordinary language.

The more correct mode would be to exclude from the natural method most of these terms, and to employ in their place some convertible words of looser import, as indeed M. Cuvier has to some extent done; such for instance, as group, section, division, to express those larger assemblages of approximations to assigned forms, which are rather predicated than proved; and in many cases to point them out by mere signs, such as are used in printing. Thus, for instance, the word section, or any similar word, might be employed to express the plants severally comprehended in the order *Gramineæ*, the class *Compositæ*, and the division

division *Monocotyledones;* and where the characters are less definite, the plants pointed at might be assembled under a simple asterisk.

One chief recommendation of the natural system over the artificial, is the liberty which it leaves to the mind. The one shuts it in to the narrowest scope of observation, while the other suffers it to range in search of all the properties belonging to created beings; their functions, their structure, relations and resemblances, affinities and analogies. It is speculative and general truth that the natural system enables us to pursue; and this will never submit to be bound by any fetters which the art of man can invent. Books after all are but a rude mode of holding knowledge together; and language but an imperfect vehicle to convey with precision the just relations of things. At best it bears the image of the earthy, while things themselves bear the image of the heavenly.

XXIV. *An*

XXIV. *An Account of a new Species of Pinus, native of California: in a Letter to Joseph Sabine, Esq., F.R. and L.S., Secretary of the Horticultural Society. By Mr. David Douglas, A.L.S. Communicated by Mr. Sabine.*

Read November 6, 1827.

Dear Sir,

Understanding upon my return from North-west America, that considerable interest has been excited by reports of a new species of *Pinus* of gigantic size having been discovered by me in Northern California, I beg permission through you to lay a short account of it before the Linnean Society.

This plant covers large districts about a hundred miles from the ocean, in latitude 43° North, and extends as far to the South as 40°. It first came under my notice in August 1825, while at the headwaters of the Multnomah River. In October 1826 it was my good fortune to meet with it beyond a range of mountains running in a south-western direction from the Rocky Mountains towards the sea, and terminating at Cape Orford of Vancouver. It grows sparingly upon low hills, and the undulating country east of the range of mountains just mentioned, where the soil consists entirely of pure sand, in appearance incapable of supporting vegetation. Here it attains its greatest size, and perfects its fruit in most abundance.

The trees do not form dense forests as most of the other Pines

Pines which clothe the face of North-west America, but like *Pinus resinosa*, which grows among them, they are scattered singly over the plains, and may be considered to form a sort of connecting link between the gloomy forests of the north and the more tropical-like verdure of California.

The trunk grows from 150 to above 200 feet in height, varying from 20 to near 60 feet in circumference. One specimen, which had been blown down by the wind,—and this was certainly not the largest which I saw,—was of the following dimensions. —Its entire length was 215 feet; its circumference three feet from the ground was 57 feet 9 inches; and at 134 feet from the ground, 17 feet 5 inches. The trunk is unusually straight, and destitute of branches about two-thirds of the height; the bark is uncommonly smooth for such large timber, of a light-brown colour on the south, and bleached on the north side. The branches are rather pendulous, and form an open pyramidal head, with that appearance which is peculiar to the *Abies* tribe. The leaves are between 4 and 5 inches long, and grow in fives, with a short sheath like those of *Pinus Strobus*; they are rigid, of a bright-green colour, but not glossy, and from minute denticulations of the margin are scabrous to the touch. The cones are pendulous from the extremities of the branches; they are two years in acquiring their full growth, are at first upright, and do not begin to droop I believe till the second year: when young they have a very taper figure; when ripe they are about 11 inches in circumference at the thickest part, and vary from 12 to 16 inches in length. The scales are lax, rounded at the apex, and perfectly destitute of spines. The seeds are large, 8 lines long and 4 broad, oval; and, like that of *Pinus Pinea*, their kernel is sweet and very pleasant to the taste. The wing is membranous, of a dolabriform figure and fuliginous colour,

about

about twice as long as the seed; it has an innumerable quantity of minute sinuous vessels filled with a crimson substance, and forming a most beautiful microscopic object. The embryo has 12 or 13 cotyledons.

The whole tree produces an abundance of pure amber-coloured resin. Its timber is white, soft, and light: it abounds in turpentine reservoirs, and its specific gravity has been ascertained from a specimen brought home by me, to be 0·463. The annual layers are very narrow; in the above specimen there were 56 in the space of four inches and a half next the outside. The resin, which exudes from the trees when they are partly burned, loses its usual flavour, and acquires a sweet taste, in which state it is used by the natives as sugar, being mixed with their food. The seeds are eaten roasted, or are pounded into coarse cakes for their winter store. I have since my return been informed by Mr. Menzies, that when he was on the coast of California with Captain Vancouver in 1793, seeds of a large Pine, resembling those of the Stone Pine, were served in the dessert by the Spanish priests resident there. These were no doubt the produce of the species now noticed. The vernacular name of it, in the language of the Umptqua Indians, is *Nát-cleh*.

The species to which this Pine is most nearly allied is undoubtedly *Pinus Strobus*; from which, however, it is extremely different in station, habit, and parts of fructification. I have named it in compliment to Aylmer Bourke Lambert, Esq., a Vice-President of the Linnean Society, whose splendid labours in investigating the genus *Pinus* are too generally known and appreciated to require any eulogium from me.

It only now remains for me to give the distinctive character of the species.

P. Lam-

P. Lambertiana; foliis quinis rigidis scabriusculis, vaginis brevissimis, strobilis crassis longissimis cylindricis: squamis laxis rotundatis.

I have the honour to be,

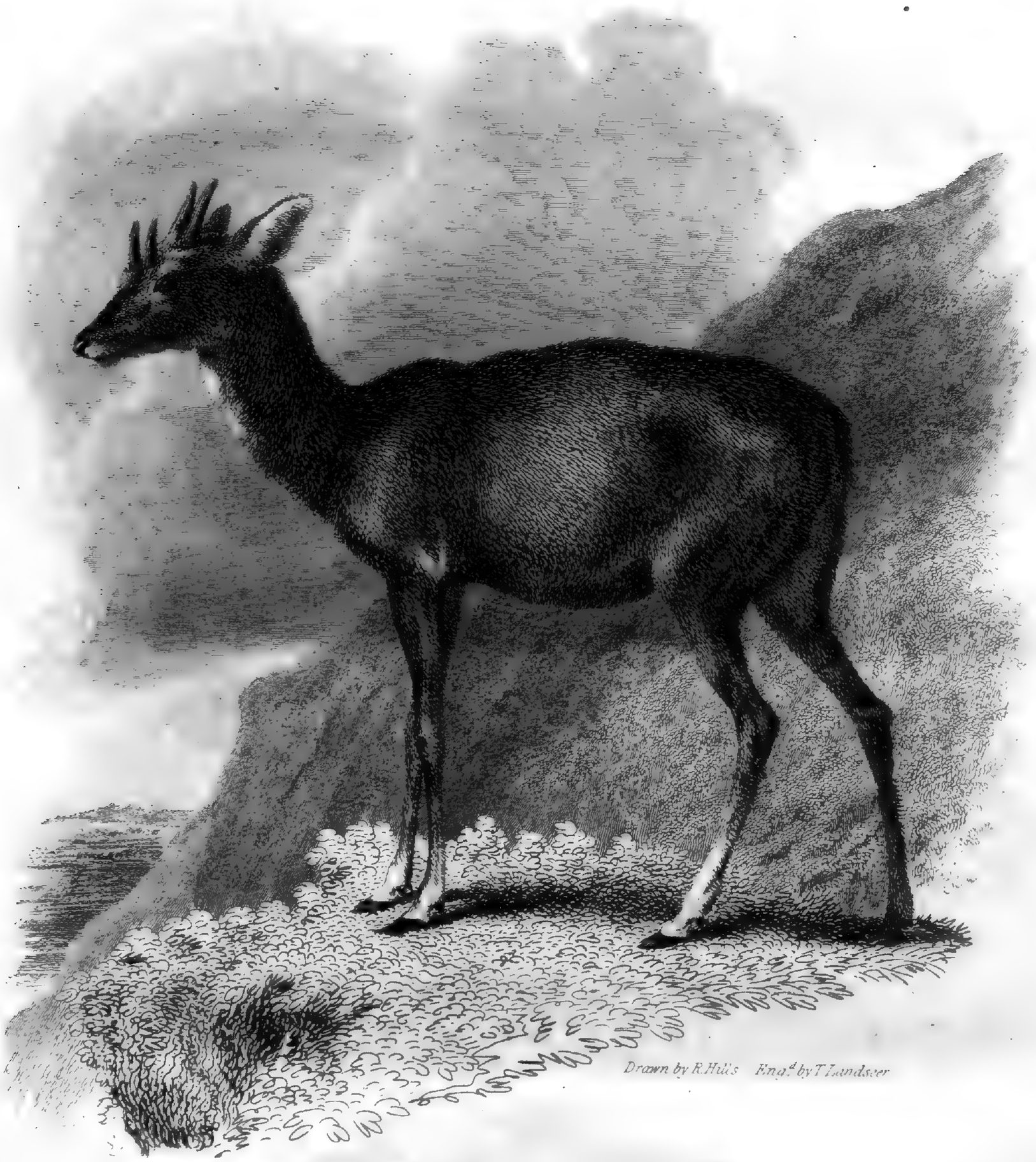
Dear Sir,

Your very obedient Servant,

David Douglas.

Horticultural Society,
November 1, 1827.

XXV. *Re-*



Drawn by R. Hills Engd. by T. Landseer

Antilope Chickara.

XXV. *Remarks on the Antilope Chickara: in two Letters addressed to the Secretary.* By Robert Hills, Esq., F.L.S.

Read November 6, 1827.

Sir, Margaret Street, August 4, 1827.

I take leave to offer, for the acceptance of the Linnean Society, two little drawings, sent herewith: they represent the general appearance, with the head, on a larger scale, of a male four-horned Antilope, lately arrived from India. There are in the museums of the Linnean Society and Royal College of Surgeons imperfect skulls of this animal, and in Mr. Brookes's valuable collection another; but this is, I believe, the first living specimen ever brought to our country. It is the property of —— Fairlie, Esq., of York Terrace, Regent's Park.

From Sir Anthony Carlisle, at whose suggestion I made the drawings, the Society will hereafter receive a communication on the more interesting points of its history and habits. In the interim, to give the dimensions, with a few remarks on its general character, may be not altogether impertinent.

Height at the shoulder, $23\frac{1}{2}$ inches; from the apex of the nose to the first pair of horns, 5 inches; from these to the base of the occiput, $5\frac{1}{2}$ inches; from the occiput to the setting-on of the tail, 26 inches; girth behind the shoulders, 24 inches; from the olecranon to the bottom of the hoof, $16\frac{1}{2}$ inches; from the end of the os calcis to the bottom of the hoof, $11\frac{3}{8}$ inches.

The

The general hue is a fulvous brown, which however will probably, as in the Stag, become duller at the approach of winter. Along the vertebral line the colour is rather darker; it is lighter and neutralized on the insides of the limbs*, which are pied of the general colour and white. The upper part of the rostrum is of a brown chocolate, which gradually, as it approaches the nostrils, melts into their colour,—a deep purplish gray. Along the margin and side of the nether jaw, from symphysis to ramus, white. The throat, breast, and abdomen, a low-toned, and, in parts, yellowish-white. In form and colour the ear closely resembles that of the *fallow-coloured* specimen of the common *Cervus palmatus*. Eye large and prominent, and the pupil very large even when exposed to a strong light.

In most of the Deer tribe, in the Ox, Sheep, Goat, and also in every other Antilope that I have seen, the lubricous character of the apex and alæ of the nose comes in pretty contrast with the hair-clad parts that surround them and form the muzzle; but in this creature the covering of the facial ridge, from a little below the first pair of horns, becomes shorter and shorter so gradually, that there is no such line of termination. The nostrils are small, and more perpendicularly placed than in any of the animals just alluded to. These points, and the tumidulous appearance of the flap that protects the *sub*-, or, as I should rather call it, *ante*-ocular sinus, give a less agreeable aspect to the head, when viewed in front, than it has in profile.

The following is, though perhaps unsatisfactory, the best description I can give of the horns:—Length of the first or smallest pair, $1\frac{3}{4}$ inch, slightly recurvate towards their tips; length of the second pair, $3\frac{1}{4}$ inches, irregular, wavy protended cones, obtusely pointed; in a trifling degree concave anteriorly,

* This is so common a circumstance among all quadrupeds, that it may seem scarcely worth mention.

and

and rather more divergent from each other than the first pair; in colour resembling those of the Goat.

There is in Deer a curly tuft of hair on the outside of the limb near the upper head of the metatarsus. In this animal it is wanting; but as the hair has been nearly all rubbed away from the knees on ship-board, it is possible that these tufts may have shared the same fate.

The fore-hoofs, of which the outermost are nearly a third longer than the inner ones, are larger and of a coarser character than those of the hinder feet.

The tongue appears to have unusual powers of projection, as in licking the face it may be seen reaching far above the eyes.

I am, Sir,

Your very humble servant,

ROBERT HILLS.

SIR, Margaret Street, Sept. 25, 1827.

THE Four-horned Antilope died about the 20th of last month, and his skeleton is now among the treasures of the College Museum. I am induced, and am enabled by these circumstances, to add a few particulars to the paper that accompanied the drawings.

A comparison of the horns borne by the subject of the present consideration, with those before in the College Museum, will perhaps warrant a conjecture that it may have its varieties. The skulls are nearly of the same size, and exactly agree in character; there are also the same three annulate ridges (concealed by hair in the living animal) at the bases of the horns; but

but there is this difference between them,—a transverse section of the smallest pair in the old specimen (the larger ones are unfortunately wanting) would exhibit a figure of a lozenge-like character, while those of the new one are nearly circular. The tips of the old horns are rather acute, of the new ones obtuse. The state of the epiphyses shows the new specimen to have been a young animal (I should presume in his second year), and the old skull appears to have belonged to an adult; but this difference in point of age does not account, as it might in deer, for such a variance of character in the horns.

To my former remarks on the nose or muzzle I beg to add, that I can recollect only one animal which in this feature resembled our Antilope,—it was a very small Deer, in the menagerie of the late Duchess of York: it was said to be Brazilian, and its horns resembled those of the Pricket *Cervus dama*. In the Nyl Ghau this part manifestly belongs to the same class with the nose of the Cow and Stag. In all other Antilopes it will, I believe, be found to accord in character with that of the Goat and Sheep.

The resemblance between the tail of this Antilope when the drawing was taken, and the "single" of the Stag, dissection has since accounted for. The number and character of the caudal vertebræ show that part to have possessed the same powers of motion as the tail of a Fallow Deer; but he must at that time have been in a state of sickness and pain, of which the *flinching*, *tucked-in* position of this member is as expressive as it is of fear.

After carefully considering the article in the 14th volume of the *Linnean Transactions* on the *Antilope Chickara*, and that in the 44th number of the "*Histoire Naturelle des Mammifères*," I am of opinion that the *Chickara* described by General Hardwicke and M. Duvaucel, and the animal whose portrait I have sent

sent you, are individuals of the same species, although shades of difference do exist amongst them. I submit that the descriptions and drawings of the General's Antilope and M. Duvaucel's, by a singular coincidence, must have both been made from imperfect specimens with regard to the first pair of horns, as an inspection of the two skulls now in the College Museum will make clearly manifest.

There is a difference of three inches between the height at the shoulder, as estimated by General Hardwicke, and that which I have given; but I followed the projection of the shoulder from the spine. The General probably placed his animal under an horizontal bar.

How easily it may happen, that accounts drawn up with equal care and correctness, by different persons, of the same animal, and even of the same individual (and more particularly if it be of the deer kind), shall, owing to some unconsidered variation of circumstances, appear to arraign the fidelity of each other!

I am, Sir,

Your most humble servant,

ROBERT HILLS.

TAB. XX.

XXVI. Extracts *from the* Minute-Book *of the* Linnean Society *of* London.

June 7, 1825. On the retirement of Alexander MacLeay, Esq., F.R.S., &c. from the office of Secretary of the Society, the following Minute, recommended by the Council, was adopted by the General Meeting of the above date, viz.

"The Linnean Society of London take the earliest opportunity, after the retirement of Alexander MacLeay, Esq. from the Secretaryship of the Society, to record upon their Minutes the high estimation in which he is held by them, on account of twenty-seven years of unremitted and unrequited labour devoted to science; and that in quitting, for a time, this sphere of usefulness, to fill an honourable station in a distant country, he carries with him the cordial esteem and sincere regret of this Society."

Read a Letter from Mr. Charles Willcox, accompanied by Specimens of *Mytilus bidens*, found by him adhering to the bottom of His Majesty's ship Wellesley, which had nine years before arrived from India, but had not from that time quitted Portsmouth harbour. The species appears to propagate itself readily: and it seems very probable that it has become naturalized in the harbour, Mr. Willcox having found large masses of them.

Nov.

Nov. 5. Mr. Arthur Aikin, F.L.S. presented a Specimen of the *Astrantia major* L., found by him in an apparently wild state in a wood which covers the N.E. side of Yeo-edge, a limestone hill, near Stokesay Castle, on the road between Ludlow and Church Stretton.

March 2, 1826. A Communication on the Locust (*Gryllus migratorius* Linn.) which lately devastated the Crimea and the southern provinces of Russia, was presented by John Smirnove, Esq., F.R. and L.S., Secretary to the Russian Embassy. The following are extracts:—"The Locust deposits its eggs in small bags composed of a thin membrane, about the size of an almond. Each of these bags is found to contain from 80 to 100 eggs; so that an idea may be formed of their amazing fecundity. In the spring, about the month of April, when the sun begins to give new life to vegetation, the eggs are quickly hatched, and the insects, in the shape of white beetles, are seen creeping out in myriads. In this state they spread themselves over whole fields during the day; but at night they collect together in clusters, and thousands of locust-hillocks may be seen in one corn-field. After remaining two or three weeks in the crawling state, the insects, daily gaining strength, next begin to leap. At this period they become destructive, from their destroying the springing corn and the young shoots of the vine; and gradually gaining strength, they spread themselves more and more, and unite in such multitudes, that in some places many miles in extent are covered with them in columns of from six to ten inches thick and upwards. In June they

they are furnished with wings; but they still remain leaping, though with additional power, being now assisted by their wings. Towards the end of the month and about the beginning of July, they cast off the whole of their upper hard covering, and become perfect flying Locusts. In this state they are exceedingly destructive, even to places at great distances; for their flight is rapid, and they are in such prodigious swarms, that their appearance in the air resembles a dense black cloud, obscuring the sun's rays, which when they penetrate, make these swarms appear like some object burning in the atmosphere. Alighting on the corn-fields, they in the space of a few hours devour every green thing, and convert immense tracts of cultivated land into absolute deserts, while nothing seems to impede their progress.

"In August the Locusts are observed busily twining themselves in pairs upon the ground: they are then in the act of copulation. In September they pierce, by means of their tail, small holes in the earth, in which they deposit their eggs in small bags, rapidly flapping their wings at the same time. Soon after this operation the insect dies.

"Various methods have been adopted to destroy the insect, either by ploughing the fields, and collecting the eggs; or, in the spring, at the dawn of day, while the insect is yet in the crawling state, by setting fire to straw which has been thrown over the locust-hillocks; or by sweeping them into sacks and destroying them. In the leaping state wide sacks are employed, into which they are driven by a person furnished with a broom; or by means of deep trenches dug in the field, into which they

are

are driven and buried. In the flying state there is no effectual method to destroy them. When a flight of them in this state alight on a field, the country-people assemble with rattles and other instruments, and by making a great noise succeed in driving them away for the time; but it is only to take refuge in the neighbouring fields. By these methods much of the vermin was destroyed; but there still remained immense quantities, and their numbers daily increased from the adjacent countries; for at the time when in New Russia the Locusts had not yet attained the winged state, legions of them made their appearance, coming, as is supposed, from the Turkish provinces. Thus the inhabitants, who had been diligently labouring to cleanse their lands of the insects by which they were already desolated, were nowise relieved from them, seeing as they did their possessions infested by others from unknown regions; and all human means seemed unavailing to avert the famine with which the provinces were menaced."

June 6. Read a Communication from the Rev. Lansdown Guilding, B.A., F.L.S., containing various additions to, and corrections of, several of his former papers. To his generic character of *Ascalaphus*, given in *Linn. Trans.* vol. xiv. p. 139, he proposes to add: "*Palpi* —— hirsuti. *Mandibulæ* validæ, apice emarginatæ, dente majori. *Ova* cute pergameneâ tecta. *Larva* complanata, lateribus pectinatis, pedibus omnibus gressoriis, mandibulis elongatis, curvis, tubulosis, apice perforatis: ano stylato, stylo colifero. Dolo prædam captans. *Pupa* folliculata, folliculo rotundato."

The

The examination of numerous specimens of the *Asc. Macleayanus* has induced him to amend the specific character and description as follows:—" A. alis vitreis immaculatis; oculis splendidissimè cupreo-nigris, lobis subæqualibus: thorace fuscescente, flavido maculato: dorso picto: lateribus cinereis.

*Descriptio.—Os pedes*que hirsuti, rufescentes: *antennæ* nigricantes, capitulo subtùs pallido: *thorax* et *facies* cinereo-pilosissimi. *Pterigostia* nigra: *stigmata* atra: *dorsum* ferrugineo-flavum, maculis brunneis ornatum: *latera* nigro varia. *Animal* insectivorum? sæpè die quiescit in arbustis vetustis emortuis, cum antennis alisque ramo applicatis, abdomineque in angulum (more ramuli) extenso, sic hostes decipiens. *Ova* numero 64—75 lanceolato-elliptica, cinerascentia, apicibus puncto candido, in extremitate ramulorum ponit imago; serie duplici alternatim agglutinans, et circulis multis *repagulorum* ab hostibus defendens. *Repagula* elongata, pedunculata, subdiaphana, rufescentia. *Larva: caput* subcordatum, fuscum, *genis* barbatis, supernè scabrum. *Os* nullum. *Mandibulæ* castaneæ, validæ, elongatæ, internè trispinosæ. *Oculi* suprà sex, infrà unicus, in *pedunculo* communi, crasso, posticè bisetoso, anticè appendiculato. *Antennulæ?* quatuor setiformes: *palpi* duo filiformes. *Thorax* parvulus, subovatus, suprà utrinque spinulâ brevi mobili, maculisque duabus nigris. *Abdomen* ovale, complanatum, scabrum, flavescens, livido irroratum, maculis quatuor anterioribus, duabus analibus, lineâque dorsali nigris: subtùs ferè concolor. *Pectines* utrinque decem, atro ciliati, anticis duobus (alarum rudimentis?) curvis. *Pedes* nigri spinulosi, duo anteriores thoracici. *Ungues* parvi, omnes simplices. *Tracheæ* parvæ, nigræ.

Larva

Larva segnis, corpus pectinesque arenulis tegens, mandibulisque sub lateribus reconditis prædam expectans. *Pullus* capite majori. *Pupa: corpus* flavescens, curvum, obesum, lanuginosum, abdomine livido irrorato, lateribus prominulis, bullatis: lineâ dorsali nigrâ. *Caput* hirsutum. *Mandibulæ* ferrugineæ. *Antennæ* supra oculos ad pectus reflexæ, *capitulo* evanido. *Oculi* nigricantes, bilobati. *Folliculus* arenulis colo anali mirè contextus, cuteque pellucido intùs tectus.

Figures of the eggs, *repagula*, and larvæ, accompanied the Communication.

By the term *Repagula* (barriers), Mr. Lansdown Guilding designates certain attendants on the eggs, which he conceives to be without analogies in the animal creation. "They are curiously placed in circles, and always on the extremity of a branch, so that nothing can approach the brood: nor can the young ramble abroad till they have acquired strength to resist the ants and other insect enemies." The female "may be seen expelling from her ovary these natural bodies with as much care as her real eggs."

To the description of the egg of *Xylocopa Teredo* (Linn. Trans. vol. xiv. p. 314.) is to be added "apicibus rotundatis:" and to that of the larva of *Horia maculata* (Ib. p. 316.) "corpus spinulis omninò indistinctis exasperatum. *Tracheæ* fuscæ. *Mandibulæ* ferrugineæ." Of the latter insect he states that several varieties exist, which will perhaps require hereafter to be regarded as so many species. The one figured *Linn. Trans.* vol. xiv. tab. 8, has the "frons plana, ocello inferiori in fossulâ subovatâ posito:" in another from South America, "*porca* elevata, bipartita, flexuosa, ocellos subtùs

subtùs cingit:" and in a third, from Barbadoes, "*porca* in duos processus auriformes irregulares expanditur."

To his list of *Onchidia* (Linn. Trans. vol. xiv. p. 323.) Mr. Lansdown Guilding adds the "*Limace Carolinienne*," (Bosc. Hist. Nat. des Vers, i. 8. pl. iii. f. 1.), a species "apparently allied to *O. occidentale*." He corrects the specific character of *Leptopodia ornata* (Ib. p. 335.), by stating, that all the feet of the male are spinous in front. He also corrects the specific name *Helicina fasciata* (Ib. p. 339.) by substituting for it *H. occidentalis*, "the two species being totally distinct." For the generic name *Caprella* (Ib. p. 341.) he likewise proposes to read *Plekocheilus*, "the former term having long since been applied to an interesting group of *Crustacea*."

Nov. 7. Joseph Woods, Esq. was chosen by ballot to fill up the vacancy in the Council, occasioned by the death of Sir Thomas Stamford Raffles, the Society having been specially summoned for the purpose of filling up such vacancy.

The Bye-Law respecting the loan of Books having been taken into consideration by the Council, it was ordered that the following be established as a Bye-Law of the Society; and that it be read at this and the subsequent Meeting of the Society, and be balloted for in the usual manner, viz.

"That no Book be allowed to be taken from the Society's House without the special leave of the Council, to be applied for in writing; that no more than two Volumes be lent to one person at the same time; that all Books be returned at the expiration of six weeks

weeks from the time of their being taken out; and that all Books so lent be regularly entered by the Librarian in a book appropriated to that purpose."

Dec. 5. The Bye-Law respecting the Loan of Books was balloted for and confirmed.

Feb. 6, 1827. A human Skull, accompanied by the following Communication, was presented from Dr. Harlan, of Philadelphia.—"This skull is supposed to have belonged to an extinct race of Indians, which existed anterior to the present natives of the soil. This is inferred not only from some marked differences in the Skulls observed on comparison with those of our modern Indians, but also from the peculiarities of the utensils, both of war and cooking, found with the Skeletons, and which resemble more those of the South Americans or East Indians.

"There are several saltpetre caves in Kentucky, but that from whence this Skull comes (Golconda) contains the most extensive remains, several cart-loads having been turned out, which are left mouldering on the soil. Occasionally whole mummies are found, preserved from decay by the atmosphere being strongly impregnated with nitre."

June 5. Mr. George Townshend Fox, F.L.S. exhibited from the Newcastle Museum, Specimens of *Loxia punctulata* L., *Loxia crassirostris* Gmel., and *Fringilla noctis* L., forming part of the late Mr. Allan's collection.

June 19. Mr. Leadbeater exhibited a Specimen of *Didelphis Ursina* (Linn. Trans. vol. ix. p. 174. t. 19.).

CATALOGUE

OF THE

LIBRARY OF THE LINNEAN SOCIETY,

Continued from Page 597 of Vol. XIV. 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.

1123. Arnott (G. A. W.) Disposition Méthodique des Espèces de Mousses. (*From Mém. Soc. Hist. Nat. Paris. tom.* 2.) Paris, 1826, 4to.

1124. Barlow (J. H.) The Daily Progress of the Chick in the Egg, and on the Changes which take place during Hatching in the Steam Apparatus. London, 1824, 8vo.

1125. ——————— The Art and Method of Hatching and Rearing all Kinds of Domestic Poultry and Game Birds by Steam. London, 1827, 8vo.

1126. Bertolonii (A.) Amœnitates Italicæ. Bononiæ, 1819, 4to.

1127. Bevan (E.) The Honey Bee; its Natural History, Physiology, and Management. London, 1827, 8vo.

1128. Bicheno's (J. E.) Address, delivered at the Anniversary Meeting of the Zoological Club of the Linnean Society of London, November 29, 1826. London, 1826, 8vo.

1129. Biddle's (N.) Eulogium on Thomas Jefferson, delivered before the American Philosophical Society. Philadelphia, 1827, 8vo.

1130. Blackstone (J.) Specimen Botanicum quo Plantarum rariorum Angliæ Loci natales illustrantur. Londini, 1746, 8vo.

1131. Bonaparte's (Charles Lucien, Prince of Musignano) Supplement to the Genera of North-American Birds, and to the Synopsis of the Species found within the Territory of the United States. (*From the Zool. Journal, no.* 10.)

1132. Bory de St. Vincent (J. B. M.) Article "Homme." (*From the Dict. Classiq d'Hist. Nat. tom.* 8.) 8vo.

1133. Bory

1133. Bory de St. Vincent (J. B. M.) Essai d'une Classification des Animaux Microscopiques. Paris, 1826, 8vo.

1134. ——————————— Une Nouvelle Distribution des Corps Naturels en Cinq Règnes. (*From the Révue Encyclopédique, tom.* 28.) 8vo.

1135. ——————————— Sur un Nouvel Appareil propre à dessêcher les Végétaux pour l'Herbier. (*From the Ann. des Scien. Nat. tom.* 8.) 8vo.

1136. ——————————— Sur un Sous Gènre à former parmi les Polypodes sous le Nom de Drynaria. (*From the Ann. des Scien. Nat. tom.* 5.) 8vo.

1137. Brandt (J. F.) and Ratzeburg (J. T. C.) Getreue Darstellung und Beschreibung der Thiere die in der Arzeneimittellehre in Betracht Kommen, heft 1. Berlin, 1827, 4to.

1138. Brayley (E. W.) A Sketch of the Progress of Science respecting Igneous Meteors and Meteorites, during the Year 1823. (*From the Phil. Mag. for* 1824.) 8vo.

1139. ——————— On certain Organs of the Helicidæ, usually regarded as their Eyes. (*From the Zool. Journ. no.* 8.) 8vo.

1140. ——————— On the Rationale of the Filamentous and Mamillary Varieties of Carbon; and on the probable Existence of but two distinct States of Aggregation in ponderable Matter. (*From the Ann. of Phil. for* 1826.) 8vo.

1141. Brignoli di Brunnhoff (Giovanni de') Dissertazione intorno alla Clorite o Terra Verde di Verona. Modena, 1827, 8vo.

1142. Brown (R.) Prodromus Floræ Novæ Hollandiæ, edit. 2. Curante C. G. Nees ab Esenbeck. Norimbergæ, 1827, 8vo.

1143. Brückmanni (F. C.) Epistolæ Itinerariæ, tom. 1—5. Wolffenbüttelæ et Brunsvigæ, 1735—56, 4to.

1144. Cæsalpini (A.) Libri XVI. de Plantis. Florentiæ, 1583, 4to.

1145. Carlisle (Sir Anthony) The Hunterian Oration for 1826. London, 1826, 4to.

1146. Circle of the Seasons, and Perpetual Key to the Calendar and Almanack. London, 1828, 8vo.

1147. Clark (Bracy) Essay on the Bots of Horses and other Animals. London, 1815, 4to.

1148. ——————— On the Knowledge of the Age of the Horse by his Teeth, with Remarks. London, 1826, 4to.

1149. Colla (A.) Hortus Ripulensis, seu Enumeratio Plantarum quæ Ripulis coluntur. Augustæ-Taurinorum, 1824, 4to.

1150. ——————— Observations sur le Limodorum Purpureum de M. de Lamarck, et Creation d'un Nouveau Gènre dans la Famille des Orchidées. (*From Ann. Soc. Linn.*) Paris, 1824, 8vo.

1151. Colla

1151. Colla (A.) Freyliniæ Genus, additâ Icone. Augustæ-Taurinorum, 1825, 4to.
1152. ——— Illustratio Generis Dyssodii, additâ Icone nondum cognitæ Speciei. (*From Mem. Accad. R. di Torino, tom.* 27.) 4to.
1153. ——— Illustrationes et Icones rariorum Stirpium quæ in ejus Horto Ripulis florebant, Annis 1824—25, additis ad Hortum Ripulensem Appendicibus 2. (*From Mem. Accad. R. di Torino, tom.* 31.) 4to.
1154. ——— Mémoire sur le Melanopsidium Nigrum des Jardiniers, et Formation d'un Gènre Nouveau dans la Famille des Rubiacées. (*From Ann. Soc. Linn. Paris, vol.* 4.) 8vo.
1155. Commelini (Joan.) Historia Plantarum rariorum Horti Medici Amstelodamensis. Amstelodami, 1697, fol.
1156. Coquebert de Montbret (Le Baron) Note sur la Population des Isles Britaniques avec quelques Considerations sur celle de la France. Paris, 1823, 8vo.
1157. Crouch's (E. A.) Illustrated Introduction to Lamarck's Conchology. London, 1826, 4to.
1038. Curtis's (J.) British Entomology, No. 17—47. London, 1825—27. 8vo.
1158. Curtis's (W.) Botanical Magazine; new Series by Dr. Hooker, No. 1—10. London, 1827, 8vo.
1159. Cuvier (G.) Leçons d'Anatomie Comparée, 5 tomes. Paris, an 8—14. 8vo.
1160. ——— Règne Animal, 4 tomes. Paris, 1817, 8vo.
1161. ——— Discours sur les Révolutions de la Surface du Globe, et sur les Changemens qu'elles on produits dans le Règne Animal. Paris, 1826. 4to.
1162. Cuvier (F.) De Dents des Mammifères considerées comme Caractères Zoologiques. Paris, 1825, 8vo.
1163. Cuvier (F.) et Geoffroy St. Hilaire. Histoire Naturelle des Mammifères, livraison 1—56. Paris, 1820—26.
1164. Dalman (J. W.) Analecta Entomologica. Holmiæ, 1823, 4to.
1165. DeCandolle (A. P.) Regni Vegetabilis Systema Naturale, vol. 1 et 2. Parisiis, 1818—21, 8vo.
1166. ——— Prodromus Systematis Naturalis Regni Vegetabilis, pars 1 et 2. Parisiis, 1824-25. 8vo.
1167. ——— Premier Mémoire sur les Lenticelles des Arbres, et le Développement des Racines qui en sortent. (*From the Ann. des Scien. Nat.* 1826.) 8vo.
1168. Dejean (Le Comte) Species Général des Coléoptères, tom. 1—2. Paris, 1825-26, 8vo.
1169. Don's (D.) Memoir on the Classification and Division of Gnaphalium and Xeranthemum of Linnæus. (*From Mem. Wern. Soc. vol.* 5.) 8vo.

1170. Don's

1170. Don's (D.) Observations on Philadelpheæ and Granateæ, two New Families of Plants. (*From Edinb. New Phil. Journ. for* 1826.)

1171. ——— On the Affinities of the Empetreæ. (*From the same.*) 8vo.

1172. ——— Description of the Genus Malesherbia of the Flora Peruviana: with Remarks on its Affinities. (*From the same, for* 1827.) 8vo.

1173. ——— Remarks on the Rhubarb of Commerce, the Purple-coned Fir of Nepal, and the Mustard Tree. (*From the same.*) 8vo.

1174. Don's (G.) Monograph of the Genus Allium (*From Mem. Wern. Soc. vol.* 6.) 8vo.

1056. Donovan's (E.) Naturalist's Repository; or Monthly Miscellany of Exotic Natural History, No. 25—38. London, 1825, 8vo.

1175. Duhamel de Monceau (M.) La Physique des Arbres. Paris, 1758, 4to.

1176. Dumortier (B. C.) Commentationes Botanicæ: Observations Botaniques. Tournay, 1822, 8vo.

1177. ——————— Agrostographiæ Belgicæ Tentamen: Observations sur les Graminées de la Flore Belgique. Tournay, 1823, 8vo.

1178. Duncan (A.) The Edinburgh New Dispensatory, 11th ed. Edinburgh 1826, 8vo.

1179. Dutrochet (H.) Récherches Anatomiques et Physiologiques sur la Structure intime des Animaux et des Végétaux, et sur leur Motilité. Paris, 1824, 8vo.

1180. ———— L'Agent immédiat du Mouvement vital devoilé dans sa Nature et dans sa Mode d'Action chez les Végétaux et chez les Animaux. Paris, 1826, 8vo.

1181. Edwards' (S.) Botanical Register, No. 145—152. London, 1827, 8vo.

1182. Exposition (7e.) publique de la Société de Flore. Bruxelles, 1825, 8vo.

1183. Fabricii (J. C.) Systema Eleutheratorum, tomi 2. Kiliæ, 1801, 8vo.

1184. ——— Systema Piezatorum. Brunsvigæ, 1804, 8vo.

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Edward Bevan, M.D. 1127.
James E. Bicheno, Esq., Sec. L.S. 1192, 1198, 1202, 1203, 1230, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1277, 1281, 1291.
Charles Lucien Bonaparte, Prince of Musignano, 1131.
Mons. Bory de St. Vincent, 1132, 1133, 1134, 1135, 1136.
Mr. Edward William Brayley, A.L.S. 1138, 1139, 1140.
Professor Brignoli di Brunnhoff, 1141.
Rev. William Carey, D.D. F.L.S. 1301.
Sir Anthony Carlisle, Knt. F.L.S. 1145.
Mr. George Charlwood, F.L.S. 1197.
Bracy Clark, Esq. F.L.S. 1147, 1148.
Mons. Colla, 1149, 1150, 1151, 1152, 1153, 1154.
Le-Baron Coquebert de Montbret, 1156.
Jonathan Couch, Esq. F.L.S. 1278.
Edward Allen Crouch, Esq. F.L.S. 1157.
John Curtis, Esq. F.L.S. 1038.

J. W. Dal-

J. W. Dalman, M.D. 1164.
Professor DeCandolle, F.M.L.S. 1167.
Mr. David Don, Libr. L.S. 1169, 1170, 1171, 1172, 1173, 1200, 1290, 1300, 1313, 1314, 1336, 1346, 1347.
Mr. George Don, A.L.S. 1174.
Mr. Edward Donovan, F.L.S. 1056.
Mons. Dumortier, 1176, 1177.
Andrew Duncan, jun., M.D. A.L.S. 1178.
M. Henri Dutrochet, M.D. 1179, 1180.
Edward Forster, Esq. Treas. L.S. 1130, 1228, 1276, 1280, 1282, 1292, 1299, 1332, 1333.
Thomas Forster, M.D. F.L.S. 1146.
George Townshend Fox, Esq. F.L.S. 1188.
John Frost, Esq. F.L.S. 1189, 1190, 1191.
John Kirkland Glazebrook, Esq. F.L.S. 1195.
Edward Griffith, Esq. F.L.S. 1199.
Mons. E. Guérin, 1201.
William Hamilton, M.D. 1204.
Richard Harlan, M.D. 1205, 1206, 1207, 1208, 1209, 1210, 1351.
Sir Richard Colt Hoare, Bart. F.L.S. 1221.
Lieut. James Holman, R.N. F.L.S. 1214.
Mr. Abel Ingpen, A.L.S. 1216.
Rev. Leonard Jenyns, M.A. F.L.S. 1217.
Captain Phillip Parker King, R.N. F.L.S. 1219.
Rev. William Kirby, M.A. F.L.S., and William Spence, Esq. F.L.S. 749.
Professor Latreille, F.M.L.S. 1221, 1222, 1223.
Mons. Alexandre Lefebure, 1224, 1225.
John Charles Litchfield, Esq. 1271.
John Claudius Loudon, Esq. F.L.S. 1272, 1273, 1274.
Charles Lush, M.D. F.L.S. 1196, 1220.
Robert Lyall, M.D. 1275.
Archibald Menzies, Esq. F.L.S. 1284, 1285.
Samuel Merriman, M.D. F.L.S. 1279.
Richard Morris, Esq. F.L.S. 1283.

John Murray, Esq. F.L.S. 1286, 1287, 1288, 1289.
George Ord, Esq. F.L.S. 916.
MM. Quoy et Gaimard, 1293, 1294, 1295, 1296, 1297, 1298.
C. Edward Rigby, M.D. F.L.S. 1137.
Matthias A. Robinson, Esq. F.L.S. 1155.
Don Ramon de La Sagra, 1302.
Mr. George Samouelle, A.L.S. 1303.
George Poulett Scrope, Esq. 1307.
Mr. George Sinclair, F.L.S. 1213.
Sir James Edward Smith, M.D. P.L.S. 1093, 1309.
Mr. George B. Sowerby, F.L.S. 1005, 1215, 1310.
James Francis Stephens, Esq. F.L.S. 511, 1311.
John Stephenson, M.D., and James Morss Churchill, Esq. F.L.S. 1312.
Count de Sternberg, 1007.
Professor Geoffroy St. Hilaire, F.M.L.S. 1349.
Mr. Robert Sweet, F.L.S. 1315.
Richard Taylor, Esq. Under Sec. L.S. 1026.
Professor Tenore, 1321, 1322, 1323.
John Thelwall, Esq. 1324.
Mons. Temminck, F.M.L.S. 1318.
John Vaughan Thompson, Esq. F.L.S. 1326.
Professor Targioni-Tozzetti, 1327, 1328.
Nicholas Aylward Vigors, Esq. F.L.S. 1330.
William Wadd, Esq. F.L.S. 1331.
Richard Waring, M.D. 1175.
John Williams, M.D. 1334.
James Wilson, Esq. 1335.
Henry Woods, Esq. 1337.

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TO THE

MUSEUM OF THE LINNEAN SOCIETY,

Exclusive of Presents of single Specimens of Animals, Plants, and Minerals.

Continued from Page 603 *of Vol. XIV. of the Society's Transactions.*

Donations.	Donors.
A Collection of dried Plants, consisting of 230 Species, chiefly from Nepal and the Islands of the Indian Archipelago . . .	The Hon. Court of Directors of the East India Company.
A Collection of Insects, chiefly from New Holland	The late James Hunter, Esq., Surgeon R.N. F.L.S.
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Specimens of Musci, Lichens, and Fungi, collected at the Cape of Good Hope . . .	Mrs. William Colebrooke.
Skull of a Hippopotamus shot by Mr. Barrow at the Cape of Good Hope in 1800, and Horns of the large Cape Antelope . . .	Sir George Thomas Staunton, Bart. F.L.S.
Specimens of Organic Matter with Sulphur from the Hot Springs of Iverdun in the Canton de Vaud, and a similar Substance without the addition of Sulphur, from the waters of Baden in the Canton d'Argovie	M. de Gimbernat, F.M.L.S.

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Donations.	Donors.
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22 Skins of Birds from the Province of Pernambuco; Specimen of the wild Cochineal Insect; of a Vegetable Wax; of Brazil Wood; and of a Gum the produce of a Tree, native of the Province of Pernambuco	John Parkinson, Esq. F.L.S. British Consul, Pernambuco.
15 Birds in Cases; 11 Bottles of Reptilia; 2 Boxes of Minerals and Fossils: a small Collection of recent and fossil Shells; and the Tusk of an Elephant	The Trustees of the late Natural History Society.
The Skull of a supposed extinct Race of Indians that formerly inhabited N. America, from the Saltpetre Caves, Kentucky	Richard Harlan, M.D.
A Collection of Ferns from the Island of Dominica, consisting of 128 Specimens . . .	The Council of the Medico-Botanical Society.
41 Skins of Birds from New Holland . . .	Alexander MacLeay, Esq. F.L.S. Colonial Sec. N.S. Wales.
38 Skins of Birds from New Holland, most of them not before in the Society's Collection; the Skins of 6 Quadrupeds; a new Species of Snake; and an Egg of the Black Swan .	Sir John Jamison, M.D. F.L.S.
Specimens of two Insects of the Family of *Vespidæ*, from Guadaloupe; and the Fangs of *Trigonocephalus lanceolatus* from Martinique	Mons. Guijon, Chief Surgeon to the French Forces in Guadaloupe.
An Ant's Nest, found in a beam of Wood at Middlehill, Worcestershire, the Seat of Sir Thomas Phillipps, Bart.	Sir Thos. Phillipps, Bart. F.L.S.
Specimens of dried Plants, collected in Lapland by the late Dr. Edward Daniel Clarke . .	Benjamin Cruttal Pierce, M.D. F.L.S.

Specimens

Donations.	Donors.
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54 Skins of Birds from New Holland; of 2 Species of *Squalus*; together with the Skull of a third Species; and of a species of *Delphinus*	Alexander MacLeay, Esq. F.L.S. Colonial Sec. N. S. Wales.
An Agricultural Chart of France, the Netherlands, and some of the neighbouring Countries on the Continent	M. Le Baron Coquebert de Montbret.
A Tabular and Proportional View of the Superior, Supermedial, and Medial (Tertiary and Secondary) Rocks	Henry Thomas De la Beche, Esq. F.L.S.
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Design for the Garden in the Regent's Park, belonging to the Zoological Society . .	The Zoological Society.
A Portrait of the late Sir Joseph Banks, Bart., President of the Royal Society, &c. . .	Aylmer Bourke Lambert, Esq. V.P.L.S.
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Erratum.

At P. 461, for *Hyæna encrita* read *Hyæna crocuta*.

DIRECTIONS

FOR

PLACING THE PLATES OF THE FIFTEENTH VOLUME.

Tab.	1.	Plectrophanes Lapponica - - -	to face page 156
	2.	Ailurus fulgens - - - - - - -	165
	3.	Sclerotium gyrosum, Delesseria tenerrima, &c. - -	348
	4.	Bursera serrata - - - - - - -	369
	5.	Boswellia serrata, &c. - - - - - -	369
	6. 7.	Oiketicus Kirbyi - - - - - - -	376
	8.	Oiketicus MacLeayi - - - - - - -	377
	9.	Sternum and Trachea of Numida cristata - - -	389
	10.	Ditto ditto of Ardea Virgo - - -	389
	11.	Ditto ditto of Anthropoides Stanleyanus -	389
	12.	Ditto ditto of Anas atrata - - -	389
	13. 14.	Trachea and Clavicles of Anas semipalmata - -	390
	15.	Tracheæ of Anas moschata, spectabilis, &c. - - -	390
	16.	Pyxis arachnoïdes - - - - - - -	395
	17.	Kinixys castanea and Homeana - - - -	398
	18.	Barclaya longifolia - - - - - - -	448
	19.	Hyæna villosa - - - - - - - -	462
	*20.	Antilope Chickara - - - - - - -	502

* The Plate is numbered by mistake Tab. 19.

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 FIFTEENTH VOLUME.

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